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Cosmatesque Quincunx, **Magdalena Ganestam, 2024** (26 x 26 cm)
Graphite pencil and colouring pencils on stained watercolour paper
Lápiz de grafito y lápices de colores sobre papel de acuarela teñido
Lápis de grafite e lápis de cor sobre papel de aquarela tingido

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These 5 drawings participated in the drawing competition organised by La Table Ronde de l'Architecture in 2025
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Estes 5 desenhos participaram no concurso de desenho organizado pela La Table Ronde de l'Architecture em 2025

General Index | Índice general | Índice geral
Mission San José in San Antonio, Texas, US, **Nathan Walz, 2024** (59,2 x 41,9 cm)
Pencil, watercolor and gouache on toned paper
Lápiz, acuarela y gouache sobre papel tintado
Lápis, aquarela e guache sobre papel tonalizado

Built work | Obras | Obras
Roosta Farmstead, **Gertrud Oberg, 2024** (A3 size)
Graphite, watercolour, and golden ink on arches paper
Grafito, acuarela y tinta dorada sobre papel Arches
Grafite, aquarela e tinta dourada sobre papel Arches

Reflections | Reflexiones | Reflexões
Church Street Shotgun House, **Alexander J. Ford, 2025** (~42 x 60 cm)
Graphite on arches paper
Grafito sobre papel Arches
Grafite sobre papel Arches

Research Papers | Artículos científicos | Artigos científicos
Gorjanc homestead, **Tim Gerdin, 2025** (A3 size)
Watercolour on rag paper
Acuarela sobre papel de algodón
Aquarela sobre papel de algodão

Book Reviews | Reseñas | Revisão de livros
Village of Săcuieu, **Daria Grigoriu, 2025** (A4 size)
Graphite on paper
Grafito sobre papel
Grafite sobre papel

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Index | Índice

Built Work | Obras

- 14 *Revitalizing Tradition in Dandaji, Niger: A Mosque and Library for Community Life*
Revitalizar la tradición en Dandaji, Niger: Una mezquita y una biblioteca para la vida comunitaria
Revitalização da tradição em Dandaji, Níger: Uma mesquita e biblioteca para a vida comunitária
Yasaman Esmaili, Mariam Issoufou
- 34 *Complete Rehabilitation of an Eighteenth-Century Mansion in Fuentes de Andalucía*
Rehabilitación integral de una casa palacio del siglo XVIII en Fuentes de Andalucía
Reabilitação integral de uma casa-palácio do século XVIII em Fuentes de Andalucía
Fernando Martín Sanjuan, José Luis Pérez Hidalgo
- 56 *Vanderbilt University's West End Residential Colleges*
Los colegios mayores del West End de la Universidad de Vanderbilt
Os colégios residenciais de West End da Universidade Vanderbilt
Steve Knight, Gregory Hoss
- 88 *The Red Pepper House in Lamu: An Exploration of the Limits of Makuti*
La Casa de la Pimienta Roja en Lamu: Una exploración de los límites del makuti
A Casa da Pimenta Vermelha em Lamu: Uma exploração dos limites do makuti
Urko Sánchez
- 106 *The Haus am Burggarten in Bonn: At the Top of the Stairs, the Stars*
Haus am Burggarten en Bonn: Al final de la escalera, las estrellas
A Haus am Burggarten em Bona: No topo da escadaria, as estrelas
Uwe Schröder, Fabian Peters
- 122 *Reflections on the Rehabilitation of a Masía Farmhouse in Les Gavarres, Province of Girona*
Consideraciones sobre la rehabilitación de una masía en Las Gavarres, Gerona
Considerações sobre a reabilitação de uma masía em Les Gavarres, Girona
Oriol Roselló Viñas

148 *Mosul’s Heritage Restored: The Story of Al-Tahera Church*
Restauración del patrimonio de Mosul: La historia de la iglesia de al-Tahira
Restauração do património de Mossul: A história da igreja Al-Tahera
Anas Zeyad Abdulmalek, Ali Salem Al-Khatabi

164 *Restoration of a barraca cottage in the Valencian Albufera*
La restauración de una barraca en la Albufera de Valencia
A restauração de uma barraca na Albufera de Valência
Fernando Vegas López-Manzanares, Camilla Mileto

178 *The Harsukh Complex in Lahore*
El complejo Harsukh en Lahore
O complexo Harsukh em Lahore
Kamil Khan Mumtaz, Hussain Ahmed

196 *Two Contemporary Hanoks Embracing Tradition and Modern Life: Myeonglinheon and Sugyeongjae*
Dos hanoks contemporáneos que aúnan tradición y vida moderna: Myeonglinheon y Sugyeongjae
Duas hanoks contemporâneas que abraçam a tradição e a vida moderna: Myeonglinheon e Sugyeongjae
Kim Won-cheon

Reflections | Reflexiones | Reflexões

218 *Rediscovering the Half-Timber Tradition*
Redescubrir la tradición del entramado de madera
Redescobrir a tradição das casas em enxaimel
Dirk Mortier

234 *Ecological Systems of Care: The Nubian Homes of Gharb Aswan*
Sistemas sostenibles de cuidados: Las viviendas nubias de Gharb Asuán
Sistemas sustentáveis de cuidados: As casas nubianas de Gharb Aswan
Neha Garg

244 *The Art of Khachkar-Making*
El arte de construir khachkars
A arte de construir khachkars
Artak Hambardzumyan

254 *Fetsund: Reimagining the Norwegian Village*
Fetsund: Reimaginar la aldea noruega
Fetsund: Reimaginar a aldeia norueguesa
Arild Eriksen, Kristoffer Røgeberg

266 *Selected Counterprojects in Brussels*
Selección de contraproyectos para Bruselas
Seleção de contraprojetos para Bruxelas
Lucien Steil, Victoria Schulz-Daubas

276 *Indiana Limestone in Three Classical Buildings Today*
La piedra caliza de Indiana en tres edificios clásicos actuales
O calcário de Indiana em três edifícios clássicos atuais
Thomas D. Stroka

290 *An Active Water-Driven Hammer Forge: Mazo de Mazonovo and Wrought Ironwork in Asturias*
Una fragua hidráulica en activo: El Mazo de Mazonovo y la forja del hierro en Asturias
Uma forja hidráulica em atividade: O Mazo de Mazonovo e a forja do ferro nas Astúrias
Friedrich Bramsteidl

Research Papers | Artículos científicos | Artigos científicos

302 *Proportion as the Timeless Essence of Mughal Architecture*
La proporción como esencia atemporal de la arquitectura mogol
A proporção como essência atemporal da arquitetura mogol
Taimoor K. Mumtaz

319 *“Ear-Roofed” Houses in Mixteca Baja, Puebla State: The Ñuu’Davi Traditional Building System*
La casa de “techo de oreja” en la Mixteca Baja de Puebla: Sistema constructivo tradicional Ñuu’Davi
A casa de “telhado de orelha” na Mixteca Baja de Puebla: Sistema construtivo tradicional Ñuu’Davi
Óscar Rafael Cruz Vázquez, Luis Fernando Guerrero Baca

336 *Tegizamin: The Invisible Engineering of Ichan-kala, Khiva*
Tegizamin: La ingeniería invisible de Ichan-kala, Jiva
Tegizamin: A engenharia invisível de Ichan-kala, Khiva
Bonu Azizova

347 *Dovecotes in the Principality of Asturias: A Neglected Heritage*
Los palomares en el Principado de Asturias: Un patrimonio olvidado
Os pombais do Principado das Astúrias: Um património esquecido
María Prieto Vergara

366 *Exploring the Beauty of Tradition: How Fractal Geometry Influences Visual Attention in Architectural Design*
La belleza de la tradición: Cómo influye la geometría fractal a la atención visual en el diseño arquitectónico
A beleza da tradição: Como a geometria fractal influencia a atenção visual no design arquitetónico
Brandon R. Ro, Xavier Parareda

385 *Building Village Life in Kamhua Noknu, Arunachal Pradesh*
Construyendo la vida comunitaria en Kamhua Noknu, Arunachal Pradesh
Construindo a vida na aldeia de Kamhua Noknu, Arunachal Pradesh
Tara Douglas

Book Reviews | Reseñas | Revisão de livros

400 *New Buildings in Old Cities: Gustavo Giovannoni Translated in English*
Edificios nuevos en ciudades antiguas: Gustavo Giovannoni traducido al inglés
Novos edifícios em cidades antigas: Gustavo Giovannoni traduzido para o inglês
Claudio Varagnoli

400 *Rural in the Plural*
Rural en plural
Rural no plural
David Escudero

401 *A Window into Cuba’s Soul: Exploring the Hidden Beauty of Cuban Courtyards*
Una ventana al alma de Cuba: Explorar la belleza oculta de los patios cubanos
Uma janela para a alma de Cuba: Explorar a beleza oculta dos pátios cubanos
Ricardo Álvarez-Díaz

402 *Sitte and the Aesthetic Dimension of the City*
Sitte y la dimensión estética de la ciudad
Sitte e a dimensão estética da cidade
María Pura Moreno Moreno

402 *Art For All*
El arte para todos
A arte para todos
Luis Prieto Prieto

403 *Portuguese Regional Architecture*
Arquitectura regional portuguesa
Arquitetura regional portuguesa
Inês Cunha Simão

404 *Drystone Walling, a “Dying Art” with a Living Language*
La construcción en piedra seca, un “arte moribundo” con un lenguaje vivo
Construção em pedra seca, uma “arte em extinção” com uma linguagem viva
Bob Powell

404 *Heritage Made by Hand*
De la mano al patrimonio
Património feito à mão
Julián García

405 *The Alhambra in Drawings*
La Alhambra dibujada
A Alhambra desenhada
Pedro Barrero Ortega

406 *Talking about Architecture*
Conversando sobre arquitectura
Conversando sobre arquitectura
Alejandro Valdivieso

406 *Echoes of the Past: Segregation and Space in the Bight of Biafra*
Ecos del pasado: Segregación y espacio en el Golfo de Biafra
Ecos do passado: Segregação e espaço no Golfo de Biafra
Zicheng (Roy) Zhang

407 *Constructing Continuity: From Craft to Traditional Urbanism*
Construir la continuidad: Del oficio al urbanismo tradicional
Construindo a continuidade: Do ofício ao urbanismo tradicional
Wesam Al Asali

408 *How to Make a Great Facade, Venetian Style*
Cómo hacer una gran fachada, a la veneciana
Como fazer uma grande fachada, ao estilo veneziano
Matthew Bell



Built Work | Obras

- 14

Revitalizing Tradition in Dandaji, Niger: A Mosque and Library for Community Life
Revitalizar la tradición en Dandaji, Niger: Una mezquita y una biblioteca para la vida comunitaria
Revitalização da tradição em Dandaji, Níger: Uma mesquita e biblioteca para a vida comunitária
Yasaman Esmaili, Mariam Issoufou
- 34

Complete Rehabilitation of an Eighteenth-Century Mansion in Fuentes de Andalucía
Rehabilitación integral de una casa palacio del siglo XVIII en Fuentes de Andalucía
Reabilitação integral de uma casa-palácio do século XVIII em Fuentes de Andalucía
Fernando Martín Sanjuan, José Luis Pérez Hidalgo
- 56

Vanderbilt University's West End Residential Colleges
Los colegios mayores del West End de la Universidad de Vanderbilt
Os colégios residenciais de West End da Universidade Vanderbilt
Steve Knight, Gregory Hoss
- 88

The Red Pepper House in Lamu: An Exploration of the Limits of Makuti
La Casa de la Pimienta Roja en Lamu: Una exploración de los límites del makuti
A Casa da Pimenta Vermelha em Lamu: Uma exploração dos limites do makuti
Urko Sánchez
- 106

The Haus am Burggarten in Bonn: At the Top of the Stairs, the Stars
Haus am Burggarten en Bonn: Al final de la escalera, las estrellas
A Haus am Burggarten em Bona: No topo da escadaria, as estrelas
Uwe Schröder, Fabian Peters
- 122

Reflections on the Rehabilitation of a Masía Farmhouse in Les Gavarres, Province of Girona
Consideraciones sobre la rehabilitación de una masía en Las Gavarres, Gerona
Considerações sobre a reabilitação de uma masía em Les Gavarres, Girona
Oriol Roselló Viñas
- 148

Mosul's Heritage Restored: The Story of Al-Tahera Church
Restauración del patrimonio de Mosul: La historia de la iglesia de al-Tahira
Restauração do património de Mossul: A história da igreja Al-Tahera
Anas Zeyad Abdulmalek, Ali Salem Al-Khatibi
- 164

Restoration of a barraca cottage in the Valencian Albufera
La restauración de una barraca en la Albufera de Valencia
A restauração de uma barraca na Albufera de Valência
Fernando Vegas López-Manzanares, Camilla Mileto
- 178

The Harsukh Complex in Lahore
El complejo Harsukh en Lahore
O complexo Harsukh em Lahore
Kamil Khan Mumtaz, Hussain Ahmed
- 196

Two Contemporary Hanoks Embracing Tradition and Modern Life: Myeonglinheon and Sugyeongjae
Dos hanoks contemporáneos que aúnan tradición y vida moderna: Myeonglinheon y Sugyeongjae
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Revitalizing Tradition in Dandaji, Niger: A Mosque and Library for Community Life

**Yasaman Esmaili,
Mariam Issoufou**

Revitalizar la tradición en Dandaji, Níger: Una mezquita y una biblioteca para la vida comunitaria

Revitalização da tradição em Dandaji, Níger: Uma mesquita e biblioteca para a vida comunitária

**Based on a conversation with Yasaman Esmaili, project co-designer*

This project in Dandaji, Niger, began with a very personal connection. The co-designer, Mariam Issoufou, is originally from Niger, and her family comes from this particular village, whose existing mosque, small and dilapidated, had long been insufficient for the community's needs. The villagers wanted to knock it down and replace it with a larger one—something more monumental, a landmark to serve a growing population.

Yet whenever Mariam visited the place, she was struck by the beauty of the old adobe mosque. It was built by El Hadji Falké Barmou, a master mason who received international recognition, including a nomination for the Aga Khan Award. By the time we envisaged

**Texto elaborado a partir de una conversación con Yasaman Esmaili, coautora del proyecto*

Este proyecto en Dandaji, Níger, surgió a partir de un vínculo muy personal. La coautora, Mariam Issoufou, es originaria de Níger y su familia procede de este mismo pueblo, cuya mezquita, pequeña y deteriorada, llevaba tiempo siendo insuficiente para las necesidades de la comunidad. Los habitantes deseaban demolerla y sustituirla por otra más grande, algo más monumental, un edificio que se convirtiera en un referente para una población en crecimiento.

Sin embargo, cada vez que Mariam visitaba el lugar, le impresionaba la belleza de la antigua mezquita de adobe. Había sido construida por El Hadji Falké Barmou, un maestro albañil que obtuvo reconocimiento internacional, incluida

**Texto elaborado a partir de uma conversa com Yasaman Esmaili, coautora do projeto*

Este projeto em Dandaji, Níger, começou com uma ligação muito pessoal. A co-criadora, Mariam Issoufou, é natural do Níger, e a sua família provém desta aldeia em particular, cuja mesquita existente – pequena e degradada – já há muito deixava de satisfazer as necessidades da comunidade. Os habitantes queriam demoli-la e substituí-la por uma maior, algo mais monumental, um marco que servisse uma população em crescimento.

No entanto, sempre que Mariam visitava o local, ficava impressionada com a beleza da antiga mesquita de adobe. Esta fora construída por El Hadji Falké Barmou, um mestre pedreiro reconhecido internacionalmente, tendo inclusive sido nomeado para o Prémio Aga

< View of the new and old mosques | Vista de la nueva y la antigua mezquita | Vista da nova e da antiga mesquita (James Wang)

> Location of the complex in Dandaji | Situación del conjunto en Dandaji | Localização do conjunto em Dandaji (Google Earth)



the project, he had passed away, but his mastery was evident in the existing structure. For us, it was unthinkable to erase that history. We began a dialogue with the villagers, seeing if there might be another way forward that preserved the old mosque while addressing their need for a larger place of worship.

Through a series of conversations, the community itself proposed transforming the old mosque into a library. They suggested that part of it become a religious library, preserving its sacred character. This adjustment allowed us to conserve the original building, give it a new civic function, and accompany it with a new mosque. Thus we were creating a civic complex uniting worship, learning, and community.

una nominación al Premio Aga Khan. Cuando concebimos el proyecto, él ya había fallecido, pero su maestría seguía siendo evidente en la estructura existente. Para nosotras resultaba impensable borrar esa historia. Así, comenzamos un diálogo con los habitantes del pueblo para explorar la posibilidad de una solución que conservara la antigua mezquita y, al mismo tiempo, diera respuesta a la necesidad de un espacio de oración más amplio.

Después de una serie de conversaciones, la propia comunidad propuso transformar la antigua mezquita en una biblioteca. Sugirieron que una parte fuera destinada a biblioteca religiosa, con el fin de mantener su carácter sagrado. Esta decisión permitió conservar el edificio original, otorgarle una nueva función cívica y acompañarlo de una nueva mezquita. De este modo, se creó un conjunto cívico que reunía culto, aprendizaje y vida comunitaria.

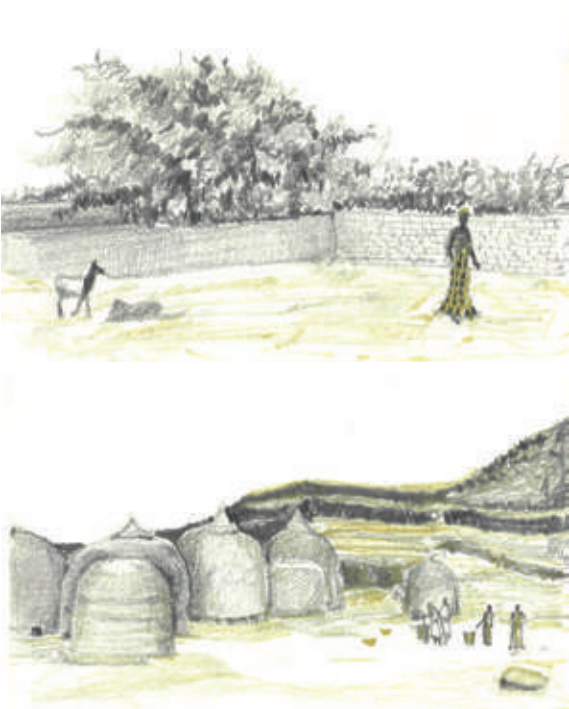
Khan. Quando concebemos o projeto, ele já tinha falecido, mas a sua mestria era evidente na estrutura existente. Para nós, era impensável apagar essa história. Começamos um diálogo com os habitantes da aldeia, para ver se haveria uma forma de preservar a mesquita antiga enquanto se satisfazia a necessidade de um espaço de culto maior.

Através de uma série de conversas, a própria comunidade propôs transformar a antiga mesquita numa biblioteca. Sugeriram que uma parte se tornasse numa biblioteca religiosa, preservando o seu caráter sagrado. Esta adaptação permitiu conservar o edifício original, atribuindo-lhe uma nova função cívica, ao mesmo tempo que se construía uma nova mesquita. Assim, estávamos a criar um complexo cívico que unia culto, aprendizagem e vida comunitária.



The project integrated into its context | El proyecto integrado en su contexto | O projeto integrado no seu contexto (James Wang)

Site drawings | Dibujos del lugar | Desenhos do local (Studio Chahar)



The Site

Dandaji is about eight hours’ drive east of Niamey, in Tahoua region, and three hours north of the border with Nigeria. The site is on the edge of the desert, where the Sahel’s arid climate dominates yet still with pockets of greenery. The regional architecture is shaped by these conditions. In traditional buildings, adobe is used to form load-bearing walls, while timber supports their roof structures, most notably in spanning elements such as vaults and domes. Wood weaving and other vernacular methods are also common, using materials from the environs.

The project had to respect this context—both in its visual presence within the village and in its material choices and techniques. We wanted the new

El lugar

Dandaji se encuentra a unas ocho horas por carretera al este de Niamey, en la región de Tahoua, y a tres horas al norte de la frontera con Nigeria. El emplazamiento se sitúa en el límite del desierto, donde predomina el clima árido del Sahel, aunque aún existen zonas con vegetación. La arquitectura regional está determinada por estas condiciones. En las construcciones tradicionales el adobe se utiliza para levantar muros portantes, mientras que la madera sostiene las cubiertas, sobre todo en elementos de gran luz como bóvedas y cúpulas. También son habituales el trenzado de madera y otros métodos vernáculos que emplean materiales del entorno.

El proyecto debía respetar este contexto, tanto en la relación visual con el entorno

O local

Dandaji situa-se a cerca de oito horas de carro a leste de Niamey, na região de Tahoua, e a três horas a norte da fronteira com a Nigéria. O terreno encontra-se na periferia do deserto, onde predomina o clima árido do Sahel, embora ainda existam algumas zonas verdes. A arquitetura regional é moldada por estas condições. Nos edifícios tradicionais, o adobe é utilizado para construir paredes estruturais, enquanto a madeira suporta as coberturas, especialmente em elementos como abóbadas e cúpulas. Técnicas vernáculos como o trançado de madeira são também comuns, utilizando materiais disponíveis nos arredores.

O projeto teve de respeitar este contexto – tanto na sua presença visual dentro da aldeia, como nas escolhas materiais e

mosque to blend with the surrounding fabric, humble yet significant, echoing historical precedents in which large mosques are grounded in simplicity and material honesty.

construido como en las decisiones sobre materiales y técnicas. Queríamos que la nueva mezquita se integrara en el tejido que la rodea, humilde pero con carácter, en consonancia con los precedentes históricos en los que las grandes mezquitas se fundamentan en la sencillez y en la honestidad constructiva.

Design Process

From the outset, we sought inspiration in local types. The old mosque itself was one reference, but we also looked at other examples across the region and beyond. In particular we studied the mosques of early Islam, many dating back a thousand years or more. In Iran, for instance, the Ilkhanid period produced simple brick mosques with a clarity of form and space that we found compelling. These precedents guided our search for a design that was both functional and traditional.

Proceso de diseño

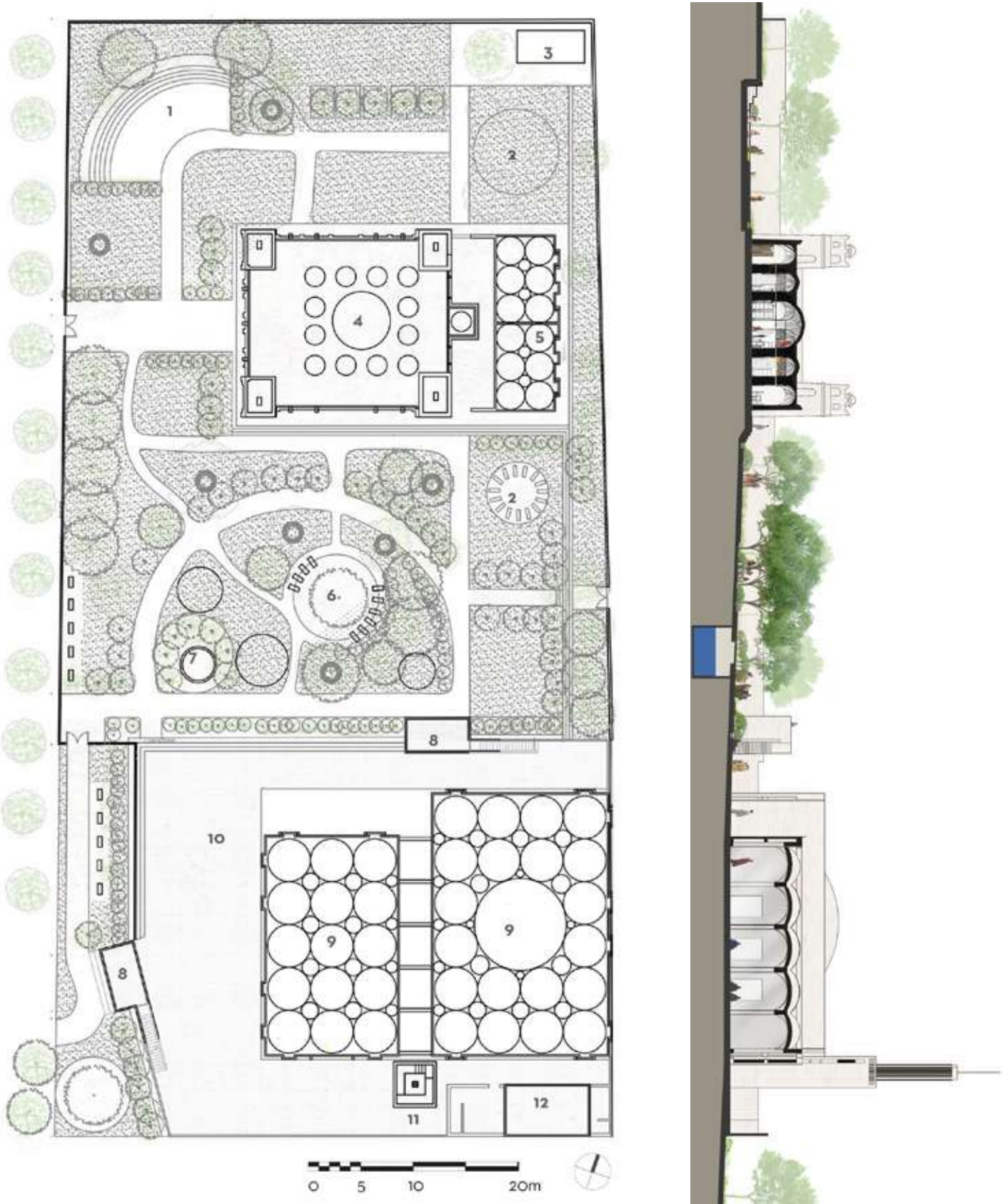
Desde el inicio buscamos inspiración en los tipos locales. La antigua mezquita fue una referencia fundamental, aunque también estudiamos otros ejemplos de la región y de territorios más lejanos. En particular, analizamos las mezquitas del islam primitivo, muchas de ellas con más de mil años de antigüedad. En Irán, por ejemplo, el periodo ilkánida dio lugar a mezquitas de ladrillo de gran sencillez, con una claridad formal y espacial que consideramos especialmente sugestiva. Estos precedentes orientaron nuestra búsqueda de un diseño que combinara funcionalidad y tradición.

técnicas construtivas. Pretendíamos que a nova mesquita se integrasse com o tecido circundante, humilde mas significativa, evocando precedentes históricos em que grandes mesquitas são baseadas na simplicidade e na honestidade material.

Processo de design

Desde o início, procurámos inspiração nos tipos locais. A própria antiga mesquita constituiu uma referência, mas também estudámos outros exemplos na região e além dela. Em particular, analisámos mesquitas do início do Islão, muitas com mil anos ou mais. No Irão, por exemplo, o período Ilcanato produziu mesquitas de tijolo simples, com clareza de forma e espaço que nos pareceram especialmente cativantes. Estes precedentes orientaram a nossa procura por um design que fosse ao mesmo tempo funcional e tradicional.

View of the new mosque from the southwest | Vista de la nueva mezquita desde el suroeste | Vista da nova mesquita a partir do sudoeste (James Wang)



Plan and section of the complex. Legend: 1. Amphitheatre and workshop area 2. Children's playground 3. Toilets 4. Library 5. New classrooms 6. Garden 7. Underground water tank 8. Ablution room 9. Prayer hall 10. Outdoor prayer area 11. Minaret 12. Imam's room | Planta y sección del conjunto. Leyenda 1. Anfiteatro y área de talleres 2. Zona de juegos para niños 3. Aseos 4. Biblioteca 5. Nuevas clases 6. Jardín 7. Depósito subterráneo de agua 8. Sala de abluciones 9. Sala de oración 10. Zona exterior de oración 11. Minarete 12. Sala del Imán | Planta e corte do conjunto. Legenda: 1. Anfiteatro e área de oficinas 2. Zona de jogos infantis 3. Instalações sanitárias 4. Biblioteca 5. Novas salas de aula 6. Jardim 7. Depósito subterrâneo de água 8. Sala de abluções 9. Sala de oração 10. Zona exterior de oração 11. Minarete 12. Sala do Imame (Studio Chahar)

One of our first challenges was to reconcile local expectations with our vision. There was an aspiration for the new mosque to be a landmark. The wish for a tall minaret, for example, led us to undertake multiple proportional studies to find a form that would stand out without overwhelming the village. We presented various options, seeking a balance between monumentality and harmonious integration with context.

Another challenge lay in defining the spatial organization. We studied typologies with multiple volumes, able to be used separately or together depending on the occasion. This flexibility resonated with the needs of the community. Finally we designed two main prayer halls, and though it was not planned, the women villagers

Uno de los primeros desafíos consistió en conciliar las expectativas locales con nuestra propia idea. Existía el deseo de que la nueva mezquita se convirtiera en un punto de referencia. La intención de levantar un minarete alto, por ejemplo, nos llevó a realizar numerosos estudios para definir una forma que destacara sin imponerse sobre el pueblo. Presentamos varias opciones con el propósito de alcanzar un equilibrio entre monumentalidad y una integración armónica con el entorno.

Otro desafío lo encontramos al definir la organización espacial. Estudiamos tipos integrados por varios volúmenes que fueran utilizables de manera independiente o conjunta según la ocasión. Esa flexibilidad respondía bien a las necesidades de la comunidad.

Um dos primeiros desafios consistiu em conciliar as expectativas locais com a nossa visão. Havia a aspiração de que a nova mesquita fosse um marco. O desejo de um minarete alto, por exemplo, levou-nos a realizar múltiplos estudos proporcionais para encontrar uma forma que se destacasse sem dominar a aldeia. Apresentámos várias opções, procurando um equilíbrio entre monumentalidade e integração harmoniosa com o contexto.

Outro desafio residiu na definição da organização espacial. Estudámos tipologias com múltiplos volumes, capazes de serem usados separadamente ou em conjunto, conforme a ocasião. Esta flexibilidade correspondia às necessidades da comunidade. Finalmente, desenhamos duas salas principais de oração e, embora não

Map showing the sourcing radius of materials: 1. Compressed earth blocks made on site 2. Mats for privacy screens 3. Ropes for partitions 4. Stone for trenches and foundations | Mapa de radio de obtención de los materiales 1. Bloques de tierra comprimida elaborados in situ 2. Esteras para paneles de privacidad 3. Cuerdas para tabiques 4. Piedra para zanjas y cimientos | Mapa do raio de obtenção dos materiais: 1. Blocos de terra comprimida produzidos no local 2. Esteiras para painéis de privacidade 3. Cordas para divisórias 4. Pedra para valas e fundações



1, 2: Construction with compressed earth blocks 3: View of the extrados of the CEB vaults 4: Work team | 1, 2: Construcción con bloques de tierra comprimida 3: Vista del trasdós de las bóvedas de BTC 4: Equipo de trabajo | 1, 2: Construção com blocos de terra comprimida 3: Vista do extradós das abóbadas de BTC 4: Equipa de trabalho

later appropriated one of them—a remarkable social change in a context where women traditionally did not attend the mosque.

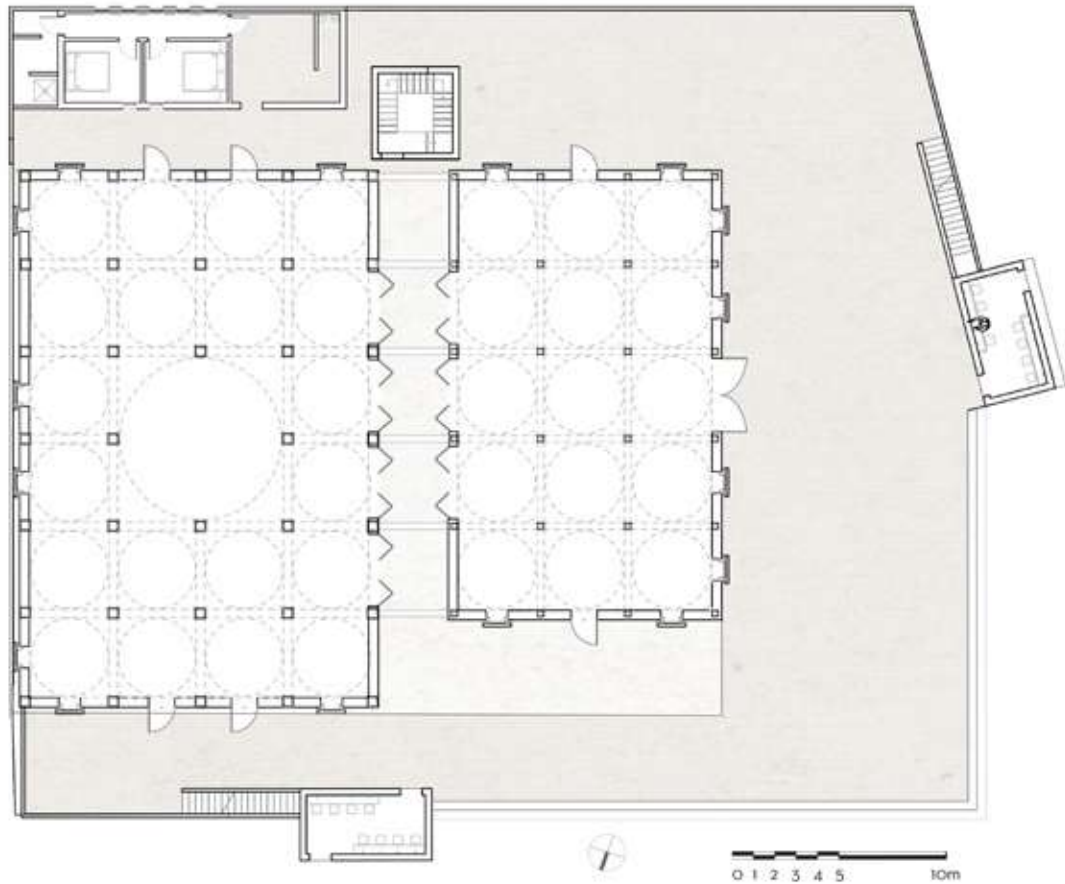
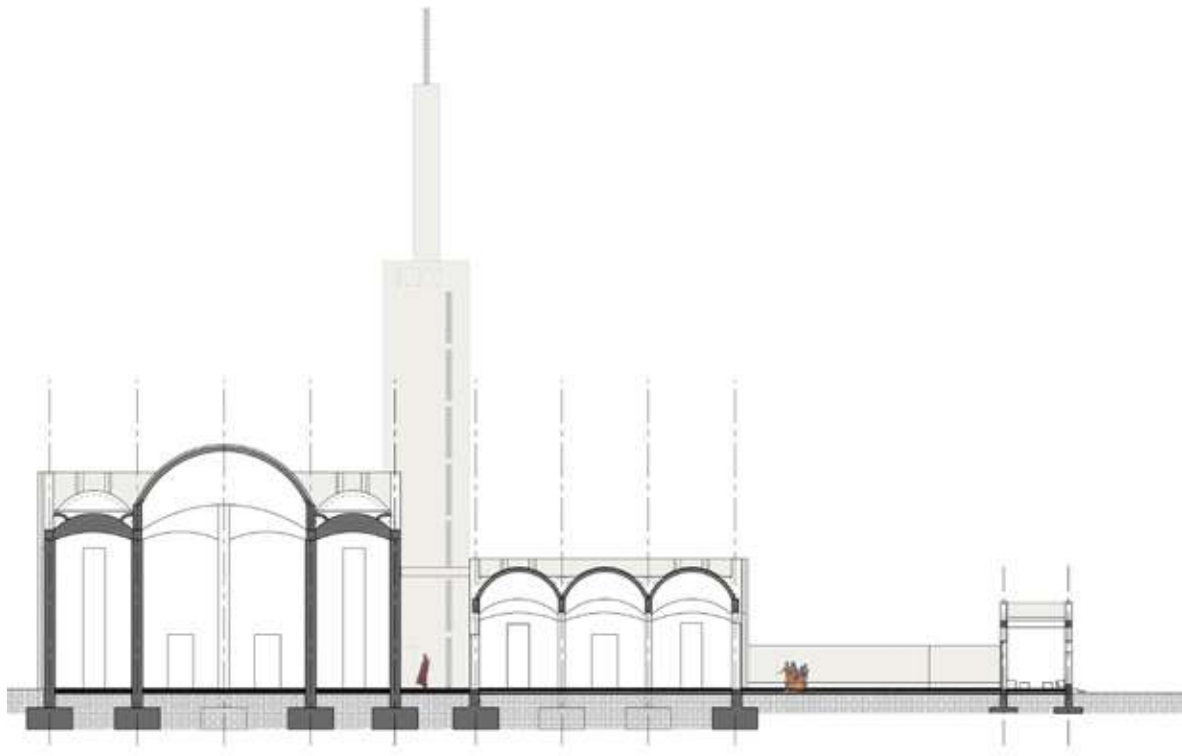
Lighting was also critical. We wanted to avoid direct sunlight, which would have made the interior uncomfortably hot. The solution was to introduce tall thin openings in the walls and minaret for indirect light. This gave the building a distinctive rhythm, reinforced by vertical details in doors and windows and even the metal pinnacle atop the minaret.

Finalmente, proyectamos dos salas principales de oración y, aunque no estaba previsto, las mujeres del pueblo terminaron apropiándose de una de ellas, un cambio social notable en un contexto donde tradicionalmente las mujeres no asistían a la mezquita.

La iluminación también fue una cuestión importante. Queríamos evitar la entrada directa de la luz solar, que habría hecho el interior excesivamente caluroso. La solución consistió en incorporar aberturas altas y estrechas en los muros y en el minarete para permitir una luz indirecta. Esto otorgó al edificio un ritmo característico, reforzado por los elementos verticales de puertas y ventanas, así como por el remate metálico que corona el minarete.

estivesse planeado, as mulheres da aldeia acabaram por apropriar-se de uma delas – uma mudança social notável num contexto em que tradicionalmente as mulheres não frequentavam a mesquita.

A iluminação também foi um elemento crítico. Pretendíamos evitar a luz solar direta, que tornaria o interior desconfortavelmente quente. A solução consistiu em introduzir aberturas altas e estreitas nas paredes e no minarete para permitir luz indireta. Isto conferiu ao edifício um ritmo distintivo, reforçado pelos detalhes verticais em portas e janelas e mesmo pelo pináculo metálico no topo do minarete.



< Plan and section of the new mosque with two prayer halls | Planta y sección de la nueva mezquita con dos salas de oración | **Planta e corte da nova mesquita com duas salas de oração** (Studio Chahar)
> Views of the new mosque from the garden | Vistas de la nueva mezquita desde el jardín | **Vistas da nova mesquita a partir do jardim** (James Wang)



Materials and Techniques

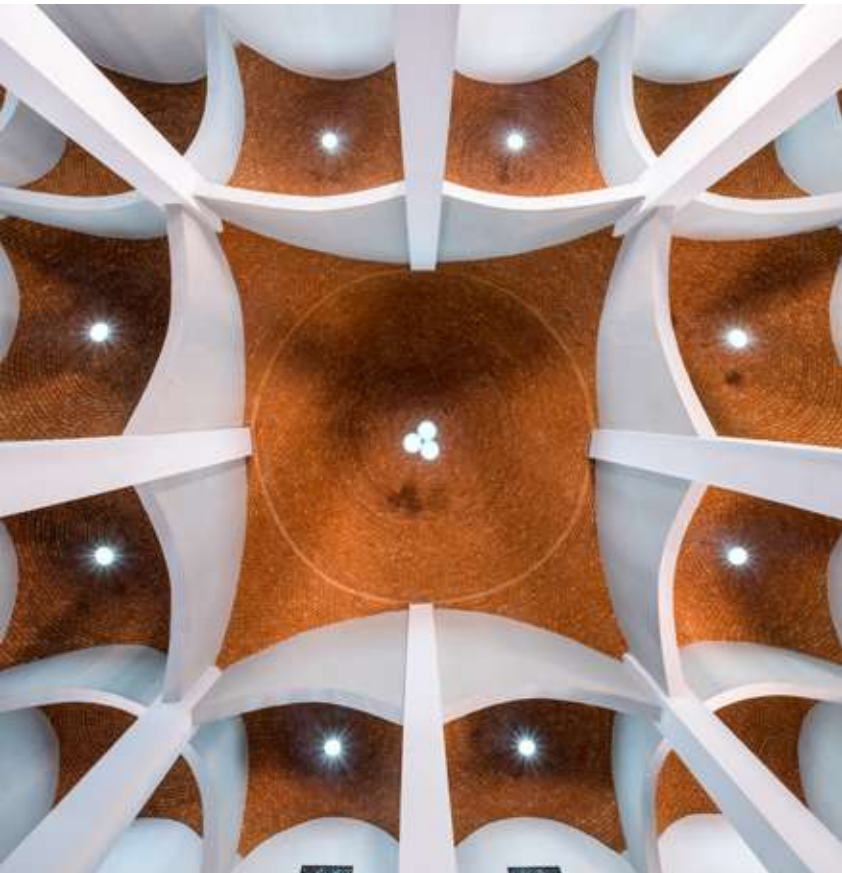
The material palette was drawn almost entirely from within a five-kilometer radius. For the new mosque, we used compressed earth blocks (CEBs), with which I had worked previously on a housing project, and we had a construction team trained in their use. CEBs have several advantages: they

Materiales y técnicas

Los materiales seleccionados procedían casi en su totalidad de un radio de cinco kilómetros. Para la nueva mezquita utilizamos bloques de tierra comprimida (BTC), con los que ya había trabajado en un proyecto de vivienda anterior y para cuyo uso contábamos con un equipo de construcción experto. Los BTC

Materiais e técnicas

A paleta de materiais foi praticamente toda obtida num raio de cinco quilómetros. Para a nova mesquita, utilizámos blocos de terra comprimida (CEBs), com os quais já tinha trabalhado anteriormente num projeto habitacional, contando com uma equipa de construção treinada na sua utilização. Os CEBs oferecem várias



are close in character to traditional adobe but provide greater density, stability, and the possibility of multiple stories. Although adobe can share these qualities, CEBs enabled us to meet the project's timing and structural demands.

ofrecen varias ventajas: su naturaleza es similar a la del adobe tradicional, pero presentan mayor densidad, estabilidad y la posibilidad de levantar edificaciones de varias plantas. Aunque el adobe puede alcanzar cualidades comparables, el empleo de BTC permitió cumplir los plazos y las exigencias estructurales del proyecto.

Interior of the main prayer hall | Interior de la gran sala de oración | Interior da grande sala de oração (James Wang)

vantagens: aproximam-se do caráter do adobe tradicional, mas conferem maior densidade, estabilidade e a possibilidade de construir vários pisos. Embora o adobe pudesse partilhar algumas destas qualidades, os CEBs permitiram-nos cumprir os prazos e exigências estruturais do projeto.

The vaults and domes were also built of compressed earth blocks. To ensure durability, especially against water infiltration, they were reinforced with a thin layer of concrete poured on top. The percentage of cement in the blocks themselves was very low, just enough to give cohesion. This method was inspired by techniques learned from Auroville, India, and Burkina-Faso, where similar updatings of tradition have been tried out.

To renovate the old mosque, we brought back some surviving members of the original team of masons. Their knowledge of adobe and wood construction was irreplaceable. The project thus became an intergenerational exchange: the older team restored the repurposed mosque with adobe while the younger team built the new mosque with CEBs.

Las bóvedas y las cúpulas también se construyeron con bloques de tierra comprimida. Para garantizar su durabilidad, especialmente frente a la infiltración de agua, se reforzaron con una delgada capa de hormigón vertida sobre su superficie. El porcentaje de cemento en los propios bloques era muy bajo, únicamente el necesario para asegurar su cohesión. Este método se inspiraba en técnicas aprendidas en Auroville, India, y en Burkina Faso, donde se han llevado a cabo actualizaciones similares de la tradición constructiva.

Para la rehabilitación de la antigua mezquita trajimos a algunos miembros supervivientes del equipo original de albañiles. Su conocimiento sobre la construcción con adobe y madera resultaba insustituible. El proyecto propició así un intercambio intergeneracional: el equipo veterano restauró la antigua mezquita reutilizada con adobe, mientras que el equipo más joven construyó la nueva con bloques de tierra comprimida.

As abóbadas e cúpulas também foram construídas em blocos de terra comprimida. Para garantir durabilidade, especialmente contra infiltrações de água, foram reforçadas com uma camada fina de betão vertido por cima. A percentagem de cimento nos próprios blocos era muito baixa, suficiente apenas para dar coesão. Este método foi inspirado em técnicas aprendidas em Auroville, na Índia, e no Burkina-Faso, onde atualizações semelhantes da tradição foram experimentadas.

Para renovar a antiga mesquita, trouxemos alguns membros sobreviventes da equipa original de pedreiros. O seu conhecimento de construção em adobe e madeira era insubstituível. O projeto tornou-se, assim, um intercâmbio intergeracional: a equipa mais experiente restaurou a mesquita adaptada com adobe, enquanto a equipa mais jovem construiu a nova mesquita com CEBs.

Interior of the women's prayer hall | Interior de la sala de oración de las mujeres | Interior da sala de oração das mulheres (James Wang)



We also included metal details. In villages across Niger, Iran, and Turkey I have seen how steel and recycled metals are often inserted in traditional contexts, and their availability and adaptability made them valuable in Dandaji. We also used woven fabric elements for shading.

También incorporamos detalles metálicos. En pueblos de Níger, Irán y Turquía he observado cómo el acero y los metales reciclados se integran con frecuencia en contextos tradicionales, y su disponibilidad y versatilidad los convirtieron en materiales valiosos en Dandaji. Además, proyectamos elementos de tejido trenzado para generar sombra.

Incluimos também detalhes metálicos. Em aldeias no Níger, Irão e Turquia, observei como o aço e os metais reciclados são frequentemente inseridos em contextos tradicionais, e a sua disponibilidade e adaptabilidade revelaram-se valiosas em Dandaji. Utilizámos ainda elementos tecidos para sombreamento.

Space between the two prayer halls | Espacio entre las dos salas de oración | Espaço entre as duas salas de oração (James Wang)



Construction Process

Construction of the mosque began in 2015 and was completed in 2018. The library was finished slightly earlier, but the two buildings were inaugurated in a joint community celebration.

Rather than use a large contractor, we assembled teams of local craftspeople

Proceso constructivo

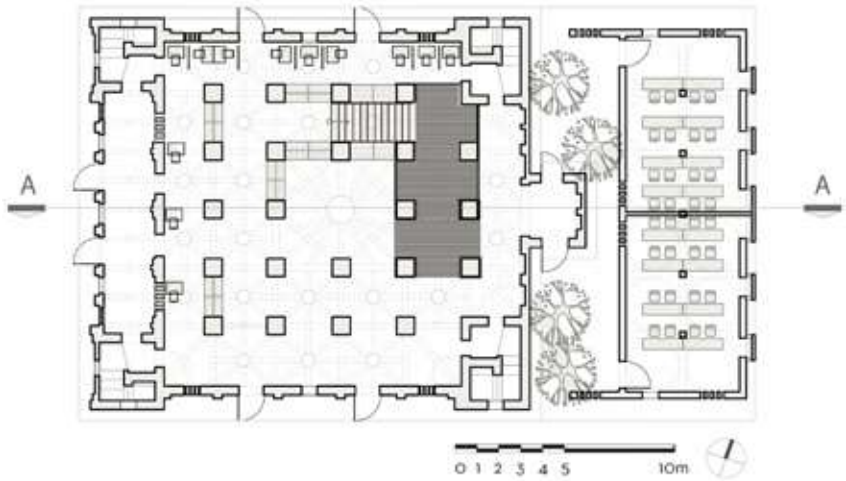
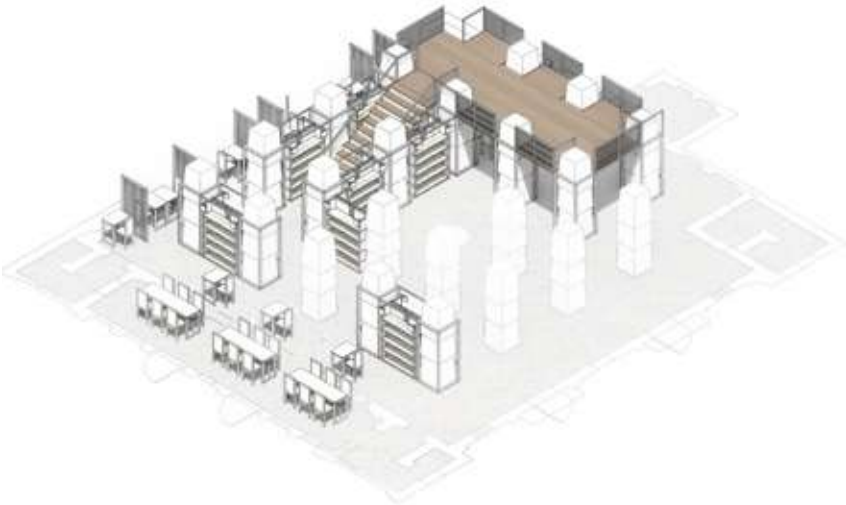
La construcción de la mezquita comenzó en 2015 y concluyó en 2018. La biblioteca se terminó un poco antes, pero ambos edificios se inauguraron conjuntamente durante una celebración comunitaria.

En lugar de recurrir a una gran empresa constructora, organizamos equipos de

Processo de Construção

A construção da mesquita iniciou-se em 2015 e foi concluída em 2018. A biblioteca ficou pronta um pouco antes, mas os dois edifícios foram inaugurados numa celebração comunitária conjunta.

Em vez de recorrer a um grande empreiteiro, reunimos equipas de artesãos



Plan, section, and axonometric view of the old mosque converted into a library | Planta, sección y axonómica de la mezquita antigua reconvertida en biblioteca | Planta, corte e axonometria da antiga mesquita reconvertida em biblioteca (Studio Chahar)

and laborers, selected according to their expertise. This approach ensured quality and also strengthened community ownership of the project. Everyone knew the builders and the site was never fenced off. Villagers visited daily to observe and discuss the work, with gatherings of women and children making the process a shared cultural experience.

artesanos y obreros locales seleccionados según su campo de especialización. Este enfoque garantizó la calidad y, al mismo tiempo, reforzó el sentido de pertenencia de la comunidad hacia el proyecto. Todos conocían a los constructores y el recinto nunca se cerró. Los habitantes acudían cada día para observar y comentar los avances, y las reuniones espontáneas de mujeres y niños convirtieron la obra en una experiencia cultural compartida.

e trabalhadores locais, selecionados de acordo com a sua experiência. Esta abordagem garantiu qualidade e fortaleceu o sentimento de apropriação do projeto pela comunidade. Todos conheciam os construtores e o terreno nunca foi vedado. Os habitantes visitavam diariamente para observar e discutir o trabalho, com encontros de mulheres e crianças tornando o processo numa experiência cultural partilhada.



Exterior and interior of one of the ablution rooms | Exterior e interior de una de las salas de abluciones | Exterior e interior de uma das salas de abluções (James Wang)



1: View of the old mosque from the new one 2, 3: Interior of the library | Vista de la antigua mezquita desde la nueva 2, 3: Interior de la biblioteca | 1: Vista da antiga mesquita a partir da nova 2, 3: Interior da biblioteca (James Wang)

The exchange between the veteran team and the younger workers was particularly meaningful. Adobe restoration techniques were practiced alongside the newer method with compressed earth blocks. Each group learned from the other, embodying our larger goal of bridging tradition and innovation.

El intercambio entre el equipo veterano y los trabajadores jóvenes fue especialmente significativo. Las técnicas de restauración con adobe se aplicaron junto al método más reciente basado en bloques de tierra comprimida. Cada grupo aprendió del otro y materializó así el propósito principal del proyecto: establecer un vínculo entre tradición e innovación.

A troca entre a equipa veterana e os trabalhadores mais jovens foi particularmente significativa. As técnicas de restauração em adobe foram praticadas em paralelo com o método mais recente de blocos de terra comprimida. Cada grupo aprendeu com o outro, concretizando o nosso objetivo mais amplo de unir tradição e inovação.



Adobe and timber structure of the library | Estructura de adobe y madera de la biblioteca | Estrutura de adobe e madeira da biblioteca (James Wang)

The new mosque has two rectangular prayer halls unified by a minaret in the rear and usable separately or together, accommodating up to 1,000 worshippers. Proportioned so as not to be overbearing, the minaret’s vertical stripes echo the lighting details of the prayer halls, creating unity across the ensemble.

The old mosque, now a library, retains its adobe and wood fabric. We added two classrooms for literacy programs and workshops, especially for women and for children from the nearby village school. Between the two buildings is an open public space, landscaped to encourage gathering. This generates a civic campus where religion, education, and community life converge.

La nueva mezquita cuenta con dos salas rectangulares de oración unificadas por un minarete situado en la parte posterior, que pueden utilizarse de forma independiente o conjunta y albergan hasta mil fieles. Proporcionado para no resultar dominante, el minarete presenta franjas verticales que reproducen los detalles de iluminación de las salas de oración y confieren unidad al conjunto arquitectónico.

La antigua mezquita, hoy convertida en biblioteca, conserva su estructura de adobe y madera. Añadimos dos aulas destinadas a programas de alfabetización y a talleres, especialmente para mujeres y para los niños de la escuela del pueblo cercano. Entre ambos edificios se dispuso un espacio público abierto, ajardinado para favorecer el encuentro. Este conjunto configura un ámbito cívico en el que convergen la religión, la educación y la vida comunitaria.

A nova mesquita possui duas salas de oração retangulares unificadas por um minarete na retaguarda, utilizáveis separadamente ou em conjunto, com capacidade para até mil fiéis. Proporcionadas de forma a não se tornarem dominantes, as faixas verticais do minarete ecoam os detalhes de iluminação das salas de oração, criando unidade em todo o conjunto.

A antiga mesquita, agora biblioteca, mantém a sua estrutura de adobe e madeira. Acrescentámos duas salas de aula para programas de alfabetização e oficinas, especialmente para mulheres e crianças da escola da aldeia próxima. Entre os dois edifícios existe um espaço público aberto, concebido de forma a incentivar encontros. Este espaço gera um campus cívico onde religião, educação e vida comunitária convergem.

Reception and Legacy

The community reception has been extremely positive. Because the villagers were involved throughout the process, they never felt the project was imposed. They watched and discussed each stage of construction and witnessed the transformation of their village’s fabric.

The most striking outcome has been the participation of women, traditionally absent from mosques in Niger. The complex has also become a venue for weddings, celebrations, and events. The library, meanwhile, has introduced literacy resources where none existed before, serving children and women and reinforcing social infrastructure.

What I value most is the humility of the architecture. In studying historic mosques—in Niger, Iran, or elsewhere—I was always inspired by those that blend into their environment, simple yet powerful. We sought the same quality—for the mosque not to proclaim itself as the most important building but to exist in harmony with its surroundings, while offering spaces of dignity and meaning.

The project has been well received internationally, but its real success lies in the daily life of Dandaji. The mosque and library are used constantly and belong entirely to the community, not as monuments frozen in time but as living, adaptable spaces.

I do not know if this project has directly influenced others in the region, but I believe it is part of a broader worldwide trend: a renewed attention to local techniques, materials, and traditions as essential to sustainable construction. As architects, we must acknowledge that industrialized building practices cannot solve our environmental crisis. Materials like earth, stone, and timber,

Recepción y legado

La acogida por parte de la comunidad ha sido sumamente positiva. Como los habitantes participaron en todas las fases del proceso, nunca sintieron el proyecto como una imposición. Observaron y comentaron cada etapa de la construcción y fueron testigos de la transformación del tejido urbano de su propio pueblo.

El resultado más notable ha sido la participación de las mujeres, tradicionalmente ausentes de las mezquitas en Níger. El conjunto se ha convertido además en un espacio para bodas, celebraciones y diversos eventos. La biblioteca, por su parte, ha incorporado recursos de alfabetización inexistentes hasta entonces, al servicio de niños y mujeres, y ha reforzado la infraestructura social de la comunidad.

Lo que más valoro es la humildad de la arquitectura. Al estudiar mezquitas históricas – en Níger, Irán y otros lugares – siempre me inspiraron aquellas que se integran en su entorno, sencillas pero con una gran fuerza expresiva. Buscamos esa misma cualidad: que la mezquita no se impusiera como el edificio más importante, sino que coexistiera en armonía con su entorno y ofreciera espacios dotados de dignidad y sentido.

El proyecto ha sido bien recibido a nivel internacional, pero su verdadero éxito reside en la vida cotidiana de Dandaji. La mezquita y la biblioteca se utilizan de forma constante y pertenecen plenamente a la comunidad, no como monumentos detenidos en el tiempo, sino como espacios vivos y adaptables.

No sé si este proyecto ha influido directamente en otros de la región, pero considero que forma parte de una tendencia global más amplia: una atención renovada a las técnicas, los materiales y las tradiciones locales como componentes esenciales de la construcción sostenible. Como

Receção e legado

A receção pela comunidade tem sido extremamente positiva. Como os habitantes participaram em todo o processo, nunca sentiram que o projeto lhes fosse imposto. Acompanharam e discutiram cada etapa da construção e testemunharam a transformação do tecido da sua aldeia.

O resultado mais marcante tem sido a participação das mulheres, tradicionalmente ausentes das mesquitas no Níger. O complexo tornou-se também um espaço para casamentos, celebrações e eventos. A biblioteca, por sua vez, introduziu recursos de literacia onde antes não existiam, servindo crianças e mulheres e reforçando a infraestrutura social.

O que mais valorizo é a humildade da arquitetura. Ao estudar mesquitas históricas – no Níger, Irão ou noutros locais – sempre me inspirei naquelas que se integram no ambiente, simples mas poderosas. Procurámos a mesma qualidade: que a mesquita não se proclamasse como o edifício mais importante, mas existisse em harmonia com a sua envolvente, oferecendo espaços de dignidade e significado.

O projeto foi bem recebido internacionalmente, mas o verdadeiro sucesso reside na vida diária de Dandaji. A mesquita e a biblioteca são utilizadas constantemente e pertencem inteiramente à comunidade, não como monumentos congelados no tempo, mas como espaços vivos e adaptáveis.

Não sei se este projeto influenciou diretamente outros na região, mas acredito que faz parte de uma tendência mundial mais ampla: uma atenção renovada às técnicas, materiais e tradições locais como essenciais para uma construção sustentável. Como arquitetos, devemos reconhecer que as práticas construtivas industrializadas não

Minaret | Minarete | Minarete (1–4: James Wang 5: Studio Chahar)



Minaret | Minarete | Minarete (1–4: James Wang 5: Studio Chahar)

used intelligently and locally, are means of reducing our ecological impact.

For me, the project was an opportunity to learn more about earthen construction and community-based design. We gained invaluable knowledge from the master masons who guided the work, from the villagers who shared their needs and traditions, and from collaboration within our team. Architecture extended beyond the making of buildings to become an interweaving of technical skills, cultural practices, and human relationships.

arquitectos, debemos reconocer que los sistemas constructivos industrializados no pueden resolver la crisis ambiental. Materiales como la tierra, la piedra y la madera, empleados con inteligencia y de manera local, permiten reducir nuestro impacto ecológico.

Para mí, el proyecto representó una oportunidad para profundizar en el conocimiento de la construcción con tierra y en el diseño participativo. Obtuvimos un conocimiento valioso gracias a los maestros albañiles que dirigieron la obra, a los habitantes del pueblo que compartieron sus necesidades y tradiciones, y a la colaboración dentro de nuestro equipo. La arquitectura trascendió la mera edificación para convertirse en una trama de destrezas técnicas, prácticas culturales y vínculos humanos.

podem resolver a nossa crise ambiental. Materiais como terra, pedra e madeira, usados de forma inteligente e local, constituem meios para reduzir o nosso impacto ecológico.

Paramim, o projeto foi uma oportunidade de aprender mais sobre construção em terra e design comunitário. Obtivemos conhecimentos inestimáveis dos mestres pedreiros que orientaram o trabalho, dos habitantes que partilharam as suas necessidades e tradições, e da colaboração dentro da nossa equipa. A arquitetura ultrapassou a construção de edifícios para se tornar uma rede de competências técnicas, práticas culturais e relações humanas.

The Dandaji mosque and library embody how tradition can be reinterpreted rather than allowed to become obsolete, how innovation can grow from within a culture instead of being imposed, and how architecture can connect past and future, the sacred and the civic, the local and the global.

La mezquita y la biblioteca de Dandaji expresan cómo la tradición puede reinterpretarse en lugar de quedar obsoleta, cómo la innovación puede surgir desde el interior de una cultura en lugar de imponerse, y cómo la arquitectura puede establecer un vínculo entre pasado y futuro, entre lo sagrado y lo cívico, entre lo local y lo global.

A mesquita e a biblioteca de Dandaji personificam como a tradição pode ser reinterpretada em vez de deixada tornar-se obsoleta, como a inovação pode emergir dentro de uma cultura em vez de ser imposta, e como a arquitetura pode ligar passado e futuro, o sagrado e o cívico, o local e o global.

Biographies | Biografías | Biografias

Yasaman Esmaili

Yasaman is an Iranian architect, educator, and founder of Studio Chahar, a design and research practice dedicated to cultural heritage, ecological resilience, and community-based design. Her work often originates in fragile contexts and results in architecture that responds to pressing social and environmental challenges. She holds degrees from the University of Tehran (B.Arch), the University of Arizona (M.Arch), and the University of Washington (M.S.). Yasaman has received the 2024 Digital Futures Critical Practice Award, the 2023 University of Washington GOLD Award, and the 2020 Tamayouz Women in Architecture Award. Her projects were shortlisted for the Aga Khan Award for Architecture (2022) and received the Global Silver and Regional Gold LafargeHolcim Awards (2017–2018). Her work has been exhibited internationally, including at the 5th Chicago Architecture Biennial and the 15th Venice Biennale.

Yasaman es arquitecta, profesora y fundadora de Studio Chahar, un estudio de diseño e investigación dedicado al patrimonio cultural, al estudio de la resiliencia ecológica y el diseño comunitario. Su trabajo suele originarse en contextos frágiles y da lugar a una arquitectura que responde a desafíos sociales y medioambientales urgentes. Es licenciada por la Universidad de Teherán (B.Arch), y posee másteres por la Universidad de Arizona (M.Arch) y la Universidad de Washington (M.S.). Yasaman ha recibido el Digital Futures Critical Practice Award (2024), el University of Washington GOLD Award (2023) y el Tamayouz Women in Architecture Award (2020). Sus proyectos fueron finalistas del Premio Aga Khan de Arquitectura (2022) y obtuvieron el Global Silver y el Regional Gold LafargeHolcim Award (2017–2018). Su obra ha sido expuesta internacionalmente, entre otros, en la 5ª Bienal de Arquitectura de Chicago y la 15ª Bienal de Venecia.

Yasaman é arquiteta, professora e fundadora do Studio Chahar, um ateliê de design e pesquisa dedicado ao patrimônio cultural, à resiliência ecológica e ao design comunitário. Seu trabalho frequentemente tem origem em contextos frágeis e resulta em uma arquitetura que responde a urgentes desafios sociais e ambientais. É formada pela Universidade de Teerã (B.Arch) e possui mestrados pela Universidade do Arizona (M.Arch) e pela Universidade de Washington (M.S.). Yasaman recebeu o Digital Futures Critical Practice Award (2024), o University of Washington GOLD Award (2023) e o Tamayouz Women in Architecture Award (2020). Seus projetos foram finalistas do Prêmio Aga Khan de Arquitetura (2022) e receberam o Global Silver e o Regional Gold LafargeHolcim Award (2017–2018). Seu trabalho foi exibido internacionalmente, incluindo na 5ª Bienal de Arquitetura de Chicago e na 15ª Bienal de Veneza.

Mariam Issoufou

Mariam is a Nigerian architect and founder of Mariam Issoufou Architects (2014), a practice spanning public, cultural, residential, commercial, and urban design. Her built works include the award-winning joint project Hikma Community Complex, the Dandaji Market, and the earth-based Yantala Office Building in Niamey. Current projects range from the Bêt-bi Museum in Senegal to Liberia’s Ellen Johnson Sirleaf Presidential Center. Alongside her practice, Issoufou is a professor and leads the Chair of Architecture, Heritage, and Sustainability at ETH Zurich. She received the 2019 Prince Claus Award, was named one of the 15 Creative Women of Our Time by *The New York Times*, and was recognized as the 2025 Champion of the Earth by the United Nations.

Mariam es una arquitecta nigerina y fundadora de Mariam Issoufou Architects (2014), un estudio que realiza proyectos públicos, culturales, residenciales, comerciales y de diseño urbano. Entre sus obras construidas destacan el premiado proyecto Hikma Community Complex, el mercado de Dandaji y el edificio de oficinas Yantala en Niamey, realizado principalmente con tierra. Sus proyectos actuales incluyen el Museo Bêt-bi en Senegal y el Centro Presidencial Ellen Johnson Sirleaf en Liberia. Paralelamente a su práctica profesional, Issoufou es profesora y dirige la Cátedra de Arquitectura, Patrimonio y Sostenibilidad en la ETH de Zúrich. Recibió el Premio Príncipe Claus en 2019, fue nombrada una de las 15 Mujeres Creativas de Nuestro Tiempo por *The New York Times* y reconocida como Campeona de la Tierra 2025 por las Naciones Unidas.

Mariam é uma arquiteta nigerina e fundadora do escritório Mariam Issoufou Architects (2014), uma prática que abrange projetos públicos, culturais, residenciais, comerciais e de design urbano. Entre suas obras construídas destacam-se o premiado projeto Hikma Community Complex, o Mercado de Dandaji e o edifício de escritórios Yantala, em Niamey, construído principalmente com terra. Seus projetos atuais incluem o Museu Bêt-bi, no Senegal, e o Centro Presidencial Ellen Johnson Sirleaf, na Libéria. Paralelamente à sua prática profissional, Issoufou é professora e dirige a Cátedra de Arquitetura, Patrimônio e Sustentabilidade na ETH Zurique. Recebeu o Prêmio Príncipe Claus em 2019, foi nomeada uma das 15 Mulheres Criativas do Nosso Tempo pelo *The New York Times* e reconhecida como Campeã da Terra 2025 pelas Nações Unidas.



Complete Rehabilitation of an Eighteenth-Century Mansion in Fuentes de Andalucía

Rehabilitación integral de una casa palacio del siglo XVIII en Fuentes de Andalucía

Reabilitação integral de uma casa-palácio do século XVIII em Fuentes de Andalucía

Fernando Martín
Sanjuan, José Luis
Pérez Hidalgo

The Ruiz Florindo Family. A Saga of Master Builders from Fuentes de Andalucía

In the eighteenth century the town of Fuentes de Andalucía, a seignorial settlement attached to the dominion of Fuentes, constituted, along with Écija, a center of remarkable architecture in the region of La Campiña east of Seville. Its population at the time was estimated at 1500 residents or households, equivalent to some 6000 inhabitants.

The town already had an emerging middle class as well as civil institutions and a nobility able to have major works of architecture undertaken in the vicinity. They provided most of the clients of the Ruiz Florindo family, a notable saga of architects and builders who created some remarkable stately houses in Fuentes de Andalucía,

Los Ruiz Florindo, saga de alarifes fontaniegos

En el siglo XVIII, la ciudad de Fuentes de Andalucía –villa de rango señorial adscrita al Señorío de Fuentes y situada sobre el Camino Real– constituía, junto con Écija, un enclave de arquitectura singular en esta zona de la campiña sevillana. Por entonces su población se estimaba en 1.500 vecinos u hogares, lo que equivale a unos 6.000 habitantes.

La ciudad contaba ya por entonces con una burguesía emergente, así como con instituciones civiles y una nobleza capaz de promover una arquitectura referencial de entidad en el territorio. Este conjunto social constituía la clientela principal de los Ruiz Florindo, arquitectos y alarifes protagonistas de una destacada saga familiar que construyó sus principales

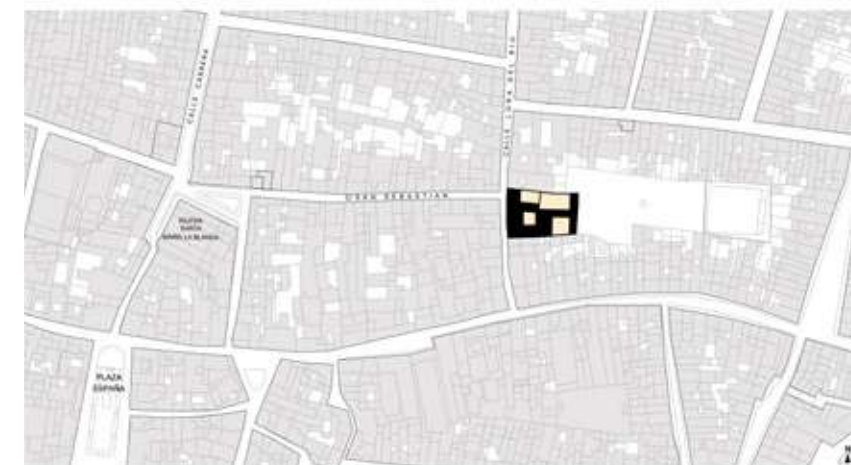
Os Ruiz Florindo. Linhagem de mestres-construtores de Fuentes de Andalucía

No século XVIII, a cidade de Fuentes de Andalucía – vila senhorial pertencente ao Senhorio de Fuentes e situada no Caminho Real – constituía, juntamente com Écija, um enclave de arquitetura singular nesta zona rural de Sevilha. Naquela época, a sua população era estimada em 1.500 vizinhos ou lares, o que equivale a cerca de 6.000 habitantes.

A cidade já contava, naquela época, com uma burguesia emergente, bem como com instituições civis e uma nobreza capaz de promover uma arquitetura de referência no território. Este conjunto social constituía a principal clientela dos Ruiz Florindo, arquitetos e mestres de obras protagonistas de uma notável linhagem familiar que construiu as suas

< Fountain spout in the columned courtyard, with the open carriage porch in the background | Surtidor de fuente en el patio de columnas, con el apeadero descubierto al fondo | Bica da fonte no pátio das colunas, com a cocheira descoberta ao fundo (Fernando Alda)

> Site of the house within the urban plan of Fuentes de Andalucía | Emplazamiento de la casa en el parcelario de Fuentes de Andalucía | Implantação da casa na malha urbana de Fuentes de Andalucía (Urbipac)



although their activity also extended to other locations such as Écija, Osuna, La Luisiana, El Arah​al, Seville, Jerez, or Puerto Real. They also produced significant work for churches, chapels, and processional brotherhoods. The dynasty’s outstanding figure was undoubtedly Alonso Ruiz Florindo, who received major commissions from the archbishopric of Seville, overseen by diocesan architects such as Pedro de Silva and Antonio Matías de Figueroa.

The work of the Ruiz Florindos is notable for its use of brick as a primary material, as may be seen in Écija and environs. This was due to a lack of stone quarries as well as an abundance of clay in the Genil valley, leading to the emergence of countless pottery workshops. In this region bricks were used for both wall-building and ornament, giving rise to a veritable school of “brick carvers and brick carpenters,” as the architect Rafael Manzano has put it, characterized by remarkable expressive forms observable especially in ornate portals and gateways. Whereas in Écija these would be carved in stone and commissioned from outside the town, in Fuentes de Andalucía a characteristic language evolved in brickwork.

The artisan process starts with whole bricks, plain or shaped by template, which are carved with overlaid mixtilinear outlines of curves and counter-curves and molded and sanded for laying *a hueso* (without mortar) or *avitoladas* (with fine head joints and thick mortar bedding). In most cases these pieces are stained with iron oxide and fitted as highlights on facing walls of brickwork with plaster joints applied “with a slanting trowel,” or else on whitewashed backdrops, as in the house at Calle Lora No. 8.

obras de casas solariegas en Fuentes de Andalucía, aunque su actividad se extendió también a otras localidades como Écija, Osuna, La Luisiana, El Arah​al, Sevilla, Jerez o Puerto Real, entre otras. También realizaron encargos para iglesias, ermitas y cofradías, de los que fueron autores destacados. Entre ellos sobresale, sin duda, la figura de Alonso Ruiz Florindo, el más notable de la saga, quien obtuvo encargos relevantes del Arzobispado de Sevilla bajo la dirección de técnicos diocesanos como Pedro de Silva y Antonio Matías de Figueroa.

La obra de los Ruiz Florindo destaca por el uso del ladrillo como material predominante, una constante en el entorno de Écija. Ello se debe, entre otras razones, a la escasez de canteras de piedra y a la abundancia de arcilla en el valle del Genil, lo que propició la aparición de un elevado número de alfarerías. En esta región el ladrillo se emplea tanto en la fábrica muraria como en los elementos ornamentales, dando lugar a una auténtica escuela de “talladores y carpinteros del ladrillo” –como los denomina el arquitecto Rafael Manzano–, caracterizada por una expresión formal muy singular, especialmente en las portadas. Mientras que en Écija éstas se realizaban en piedra y se encargaban fuera de la ciudad, en Fuentes de Andalucía se desarrolló un lenguaje propio en ladrillo.

El proceso constructivo parte de ladrillos enteros, simples o aplantillados, que se tallan posteriormente con siluetas superpuestas mixtilíneas de curvas y contracurvas, molduradas y lijadas, para ser aparejadas “a hueso” o “avitoladas”. En la mayoría de los casos estas piezas se tiñen con almagra y se destacan sobre el paramento de ladrillo labrado, con llagas de estuco aplicadas “a paletín inclinado” o sobre fondos blancos enjalbegados, como puede observarse en la casa de la calle Lora nº 8.

principais casas senhoriais em Fuentes de Andalucía, embora a sua atividade se estendesse também a outras localidades como Écija, Osuna, La Luisiana, El Arah​al, Sevilha, Jerez, Puerto Real, entre outras. Também realizaram obras para igrejas, capelas e confrarias, dos quais foram autores de destaque. Entre eles destaca-se, sem dúvida, a figura de Alonso Ruiz Florindo, o mais notável da linhagem, a quem foram atribuídas obras relevantes pelo Arcebispado de Sevilha sob a direção de técnicos diocesanos como Pedro de Silva e Antonio Matías de Figueroa.

A obra dos Ruiz Florindo destaca-se pelo uso do tijolo como material predominante, uma constante na região de Écija. Isso deve-se, entre outras razões, à escassez de pedreiras e à abundância de argila no vale do Genil, o que favoreceu o surgimento de um grande número de olarias. Nesta região, o tijolo é utilizado tanto na construção de paredes como em elementos ornamentais, dando origem a uma autêntica escola de «escultores e carpinteiros do tijolo» – como os denomina o arquiteto Rafael Manzano –, caracterizada por uma expressão formal muito singular, especialmente nas fachadas principais. Enquanto em Écija estas eram feitas em pedra e encomendadas fora da cidade, em Fuentes de Andalucía desenvolveu-se uma linguagem própria em tijolo.

O processo de construção começa com tijolos inteiros, simples ou moldados, que são posteriormente talhados com silhuetas sobrepostas com linhas mistas de curvas e contra-curvas, moldadas e lixadas, para serem assentadas a seco ou *avitoladas*. Na maioria dos casos, estas peças são tingidas com almagra e destacam-se sobre a fachada de tijolo trabalhado, com juntas verticais de estuque aplicadas *a paletín inclinado* ou sobre fundos brancos caiados, como se pode observar na casa da rua Lora nº 8.



1



2



3

1, 2: Details of the brick-cut and carved doorway 3: Main façade with a double-bay “altarpiece-style” doorway and a three-arched tower seen from San Sebastián Street | 1, 2: Detalles de la portada de ladrillo cortado y tallado 3: Fachada principal con portada de doble tiro (“tipo retablo”) y torreón de tres arcos desde la calle San Sebastián | 1, 2: Detalhes do portal em tijolo cortado e esculpido 3: Fachada principal com portal de duplo vão (“tipo retábulo”) e torre de três arcos vista da rua San Sebastián (1, 2: Alejandro García Hermida 3: Fernando Alda)

House at Calle Lora No. 8. Typological Analysis

This is a stately townhouse originally belonging to the Andrés de León Orbaneja y López Pilares family. It was subsequently bought by José Hermógenes González de la Riva for his son, José Hermógenes, and later owned by María González Herce (Señorita María) and Antonia Prats González. The house is a very particular example of the Andalusian Baroque, built in 1755–1760 by Alonso Ruiz Florindo, the most celebrated figure of a peerless saga of “carved brick” architects in the region of La Campiña.

Casa de la calle Lora nº 8. Análisis tipológico

Se trata de la casa palacio solariega original de la familia de Andrés de León Orbaneja y López de Pilares. Posteriormente fue adquirida por don José Hermógenes González de la Riva para su hijo, don José Hermógenes, y más adelante pasó a ser propiedad de María González Herce (Srta. María) y Antonia Prats González. La casa constituye una tipología muy singular del barroco andaluz, construida entre 1755 y 1760 por Alonso Ruiz Florindo, principal referente de la inigualable saga de arquitectos del “ladrillo tallado” en la campiña sevillana.

Casa na rua Lora nº 8. Análise tipológica

Trata-se da casa-palácio senhorial original da família de Andrés de León Orbaneja e López de Pilares. Posteriormente, foi adquirida por José Hermógenes González de la Riva para o seu filho, José Hermógenes, e mais tarde passou a ser propriedade de María González Herce (Srta. María) e Antonia Prats González. A casa constitui uma tipologia muito singular do barroco andaluz, construída entre 1755 e 1760 por Alonso Ruiz Florindo, principal referência da incomparável linhagem de arquitetos do “tijolo talhado” na zona rural de Sevilha.



Main doorway of the Casa Palacio before and after the intervention | Portada de la Casa Palacio antes y después de la intervención | Portal da Casa Palácio antes e depois da intervenção (1: Urbipac 2: Fernando Alda)

The current owners, Isabel Bermúdez-Coronel Prats and Sebastián Urbán Muñoz, undertook a refurbishment according to the master plan and guidance of the architect Fernando Martín Sanjuán, and the work was directed by the architect José Luis Pérez Hidalgo and the building engineer José Luis Pérez Chamorro.

Exceptional contributions were made by the traditional master builders José Pérez Gamero (“Sillero Padre”) and Sebastián Pérez Gómez (“Sillero Hijo”) and their team, supported by the master craftsmen Miguel Ángel Balmaseda Rosa (woodwork), Rafael Fernández Aguilar (stonemasonry), Alberto Rodríguez Fernández (wrought ironwork), and José Manuel Lora González (painting).

The building has a facade 29.5 m high on Calle Lora, an average depth of 42 m, and a total area, according to a recent survey, of 1100 m². It has three dividing

Los actuales propietarios, Isabel Bermúdez-Coronel Prats y Sebastián Urbán Muñoz, iniciaron las obras de puesta al día según el plan director redactado y con el asesoramiento del arquitecto Fernando Martín Sanjuán, bajo la dirección del arquitecto José Luis Pérez Hidalgo y del aparejador José Luis Pérez Chamorro.

Participaron como colaboradores de excepción en la ejecución de las obras los alarifes José Pérez Gamero (“sillero padre”) y Sebastián Pérez Gómez (“sillero hijo”), junto a su cuadrilla, que contó además con el apoyo de los maestros artesanos Miguel Ángel Balmaseda Rosa (carpintería), Rafael Fernández Aguilar (cantería), Alberto Rodríguez Fernández (forja) y José Manuel Lora González (pintura).

El inmueble presenta una fachada de 29,50 metros a la calle Lora nº 8, con un fondo medio de 42 metros y una

Os atuais proprietários, Isabel Bermúdez-Coronel Prats e Sebastián Urbán Muñoz, iniciaram as obras de modernização de acordo com o plano diretor elaborado e com a consultoria do arquiteto Fernando Martín Sanjuán, sob a direção do arquiteto José Luis Pérez Hidalgo e do engenheiro civil José Luis Pérez Chamorro.

Participaram como colaboradores excepcionais na execução das obras os mestres-construtores José Pérez Gamero (“sillero pai”) e Sebastián Pérez Gómez (“sillero filho”), juntamente com a sua equipa, que contou também com o apoio dos mestres artesãos Miguel Ángel Balmaseda Rosa (carpintaria), Rafael Fernández Aguilar (cantaria), Alberto Rodríguez Fernández (ferro forjado) e José Manuel Lora González (pintura).

O imóvel apresenta uma fachada de 29,50 metros na rua Lora nº 8, com uma profundidade média de 42 metros e uma superfície total, de acordo com medições



1: Support corbels for the eaves made by Miguel Ángel Balmaseda 2: Restoration of the brickwork in the spandrel 3: Process of cobbling and paving the open carriage porch | 1: Ménsulas de apoyo del tejazoz realizadas por Miguel Ángel Balmaseda 2: Restauración del ladrillo de la enjuta 3: Proceso de empedrado y enchinado del apeadero descubierto | 1: Mísulas de suporte do beiral executadas por Miguel Ángel Balmaseda 2: Restauo do tijolo na enjuta 3: Processo de empedramento e calçada da cocheira descoberta (1: Miguel Ángel Balmaseda 2: Sebastián Pérez Gómez 3: Urbipac)

walls, with two consolidated easement openings to the adjoining property on the south side. It is accessed by a grand gateway at the north of the plot, aligned with Calle San Sebastián, through a tower with a three-by-two arrangement of arches. This leads to an entrance yard originally for mounting and dismounting, with open and covered portions.

superficie total, según medición reciente, de 1100 m². Limita con tres medianeras, en las que hay dos huecos de servidumbre consolidados desde la propiedad hacia el predio colindante en su medianera sur. El acceso se realiza a través de una portada principal situada en el extremo norte de la parcela –alineada con la calle San Sebastián–, sobre la que se eleva un torreón con disposición de tres arcos por

recentes, de 1100 m². É delimitado por três paredes divisórias, nas quais existem duas aberturas de servidão da propriedade para o terreno adjacente na sua parede divisória sul. O acesso é feito através de uma porta principal situada na extremidade norte do terreno – alinhada com a rua San Sebastián –, sobre a qual se ergue uma torre com uma disposição de três por dois arcos. A entrada dá acesso

The northeast corner of the columned courtyard, the overgrown rear patio, and the second flight of the main staircase before intervention | Estado previo a la intervención del vértice noreste del patio de columnas, del patio trasero asilvestrado y del segundo tramo de la escalera principal | Estado anterior à intervenção do vértice nordeste do pátio das colunas, do pátio posterior silvestre e do segundo lanço da escada principal (Urbipac)



The remarkable gateway is unusually off-center relative to the tower—63 cm to the south of the centerline. This position allows the gate to be aligned with Calle San Sebastián, the perpendicular street, so that the portal may be viewed with greater perspective. This is an unusual architectural device reflecting Alonso Ruiz Florindo’s constant concern for composition and for the overall perception of the ensemble.

dos. La entrada da paso a un apeadero parcialmente cubierto y descubierto.

Esta singular portada de acceso se encuentra, curiosamente, descentrada respecto al eje del mirador descrito, con un desplazamiento de 63 cm hacia el sur. Esta disposición busca alinearse con el eje perpendicular de la calle San Sebastián, de modo que la portada pueda ser vista desde una perspectiva lejana. Se trata de un recurso arquitectónico poco habitual que revela la constante preocupación compositiva de Alonso Ruiz Florindo y su atención a la percepción global del conjunto.

a um patamar parcialmente coberto e descoberto.

Curiosamente, esta singular porta de entrada encontra-se descentrada em relação ao eixo do miradouro descrito, com um desvio de 63 cm para sul. Esta disposição procura alinhar-se com o eixo perpendicular da rua San Sebastián, de modo a que a porta possa ser vista de uma perspetiva distante. Trata-se de um recurso arquitetónico pouco habitual que revela a constante preocupação compositiva de Alonso Ruiz Florindo e a sua atenção à perceção global do conjunto.

The house is organized around a central courtyard with previously unbuilt areas at the back, once containing livestock enclosures and henhouses and which were overgrown through neglect.

La planta del edificio se organiza en torno a un patio central y quedaban en la parte posterior los espacios no edificados. Estos estaban asilvestrados debido al abandono y originalmente albergaban los antiguos corrales y gallineros.

A planta do edifício está organizada em torno de um pátio central, com os espaços não construídos na parte traseira, que estavam bravios antes da intervenção devido ao abandono, e que originalmente abrigavam os antigos currais e galinheiros.

Architectural Intervention

The owners’ brief was for six double bedrooms with ensuite bathrooms (one for each family member plus a guestroom), along with a series of ancillary rooms including an office, a

Intervención arquitectónica

El programa requerido contempla, además de seis dormitorios dobles con baño en suite (uno para cada miembro de la familia y uno adicional para invitados), una serie de espacios servidores, que

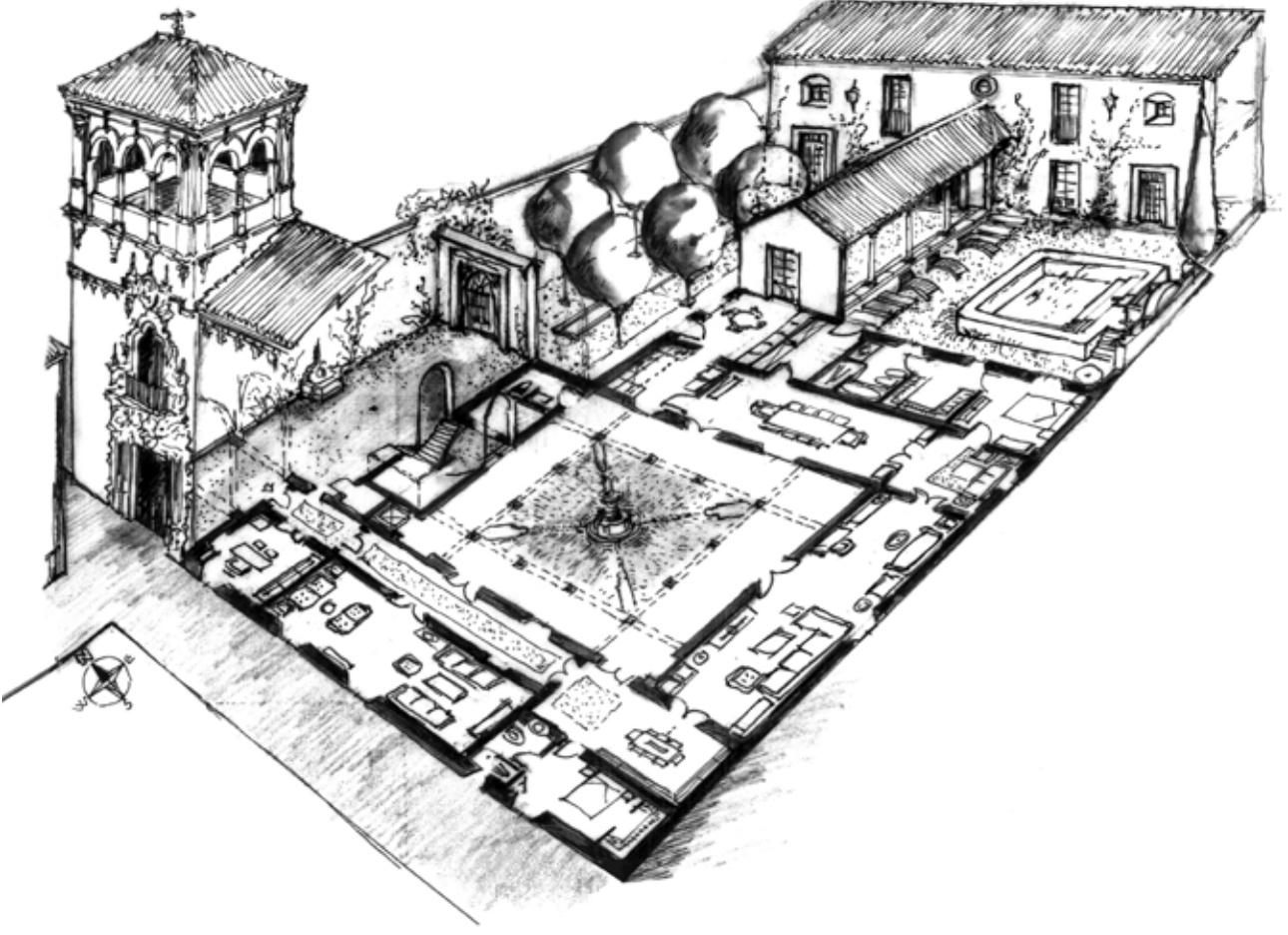
Intervenção arquitetónica

O projeto requerido prevê, além de seis quartos duplos com casa de banho privativa (um para cada membro da família e um adicional para convidados), uma série de espaços de serviço, que

1: Aerial view of the overall state of the palace before its rehabilitation 2: Roof plan after the intervention | 1: Imagen aérea del estado general del palacio antes de la intervención 2: Imagen de la planta de cubiertas tras la intervención | 1: Vista aérea do estado geral do palácio antes da reabilitação 2: Planta das coberturas após a intervenção (1: Urbipac 2: Fernando Alda)



Perspective sketch of the project | Boceto en perspectiva del proyecto | Esboço em perspetiva do projeto (Fernando Martín)





Evolution of the house's floor plans throughout the 18th, 20th and 21st centuries | Evolución de la planimetría de la vivienda en los siglos XVIII, XX y XXI | *Evolução da planimetria da habitação nos séculos XVIII, XX e XXI (Urbipac)*

parlor, a living room, television and reading rooms, a bedroom vestibule, a dining room, and a kitchen, supplemented by auxiliary spaces for circulation.

Despite the plot area of over 1000 m², in the program of the original building just two bedrooms and one bathroom were identifiable, with the other spaces being devoted to living or circulation areas. The brief for renewing the program involved using the two existing bedrooms—one in the double west bay,

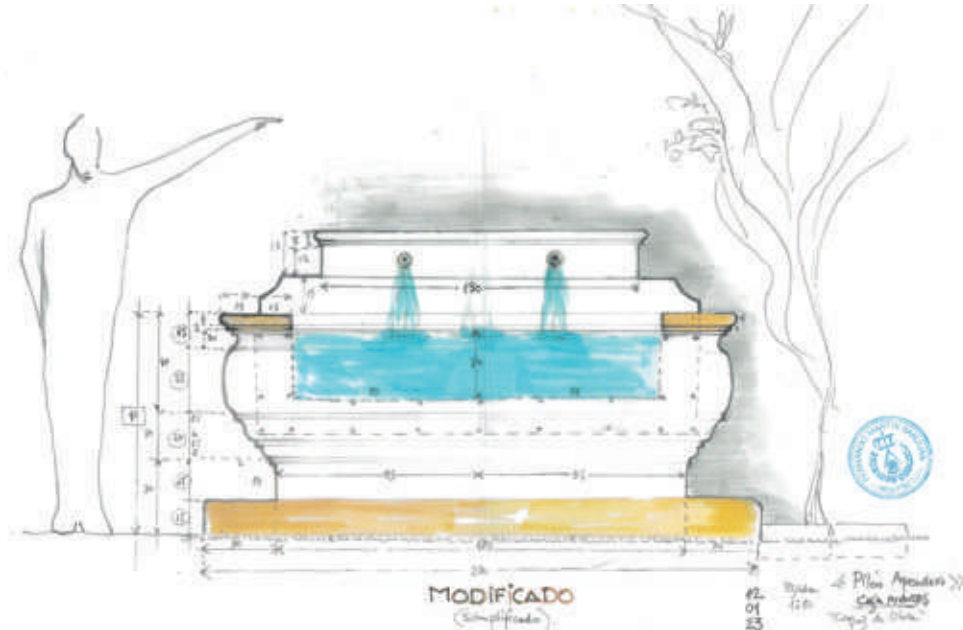
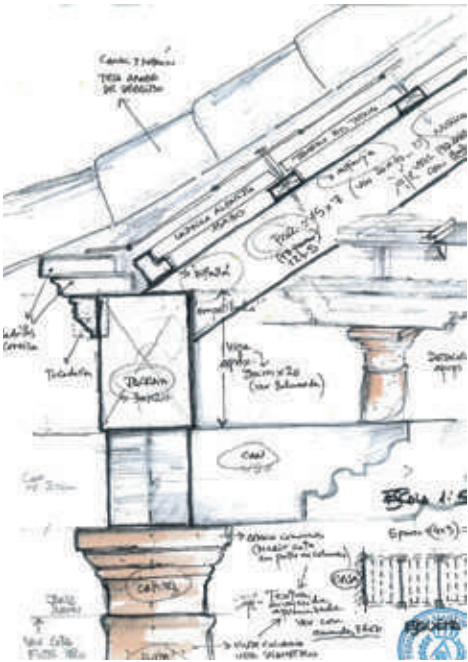
incluye despacho, salón de recibo, sala de estar, espacios para televisión y lectura, antesala de dormitorio, comedor y cocina. El programa se completa con los espacios servidores destinados a la circulación y el tránsito.

Si bien la parcela cuenta con una superficie superior a 1000 m², en la edificación primitiva sólo podían identificarse, dentro del programa original, dos dormitorios y un baño. El resto de los espacios estaban destinados a estancias, alcobas y, en algunos casos, zonas de paso.

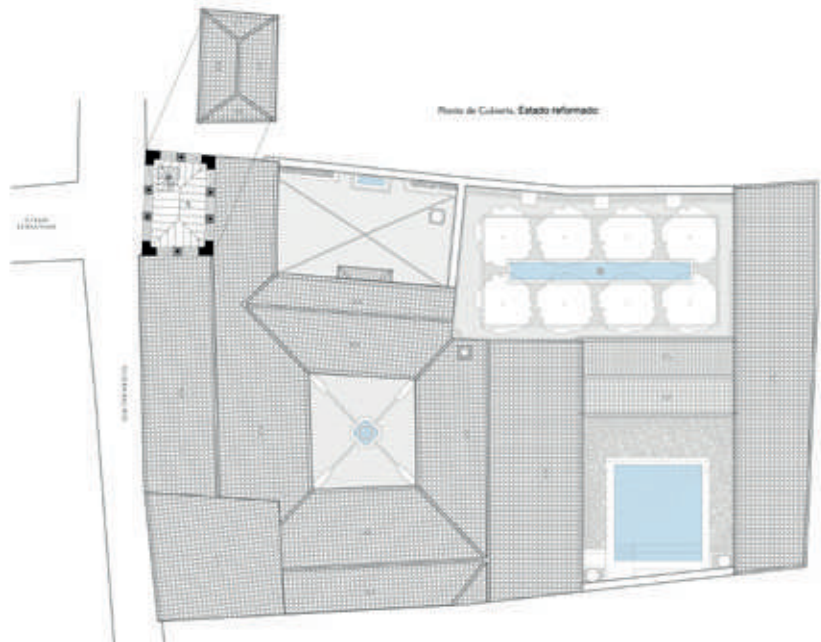
incluem escritório, salão de visitas, sala de estar, espaços para televisão e leitura, antesala do quarto, sala de jantar e cozinha. O projeto é concluído com os espaços de serviço destinados à circulação.

Embora o terreno tenha uma superfície superior a 1000 m², na construção original só era possível identificar, dentro do projeto original, dois quartos e uma casa de banho, ficando o resto dos espaços destinados a salas, alcovas e, em alguns casos, zonas de passagem. O critério seguido para a atualização do

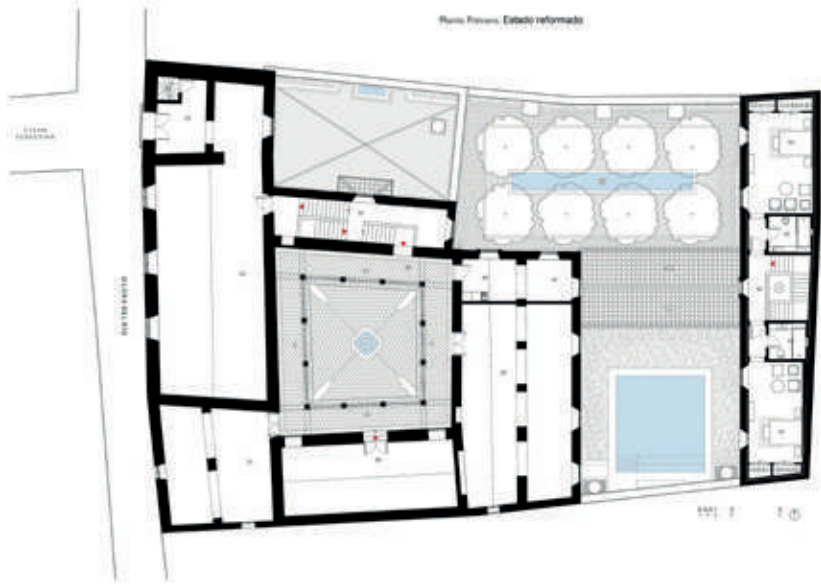
Work sketch showing a detail of the “par y nudillo” roof of the connecting porch and the attached double-spout basin | Croquis de obra con un detalle de la cubierta “par y nudillo” del porche de comunicación y del pilón adosado de dos surtidores | *Esboço de obra com um detalhe da cobertura “par e nó” do alpendre de ligação e do tanque adossado com dois bicos (Fernando Martín Sanjuán)*



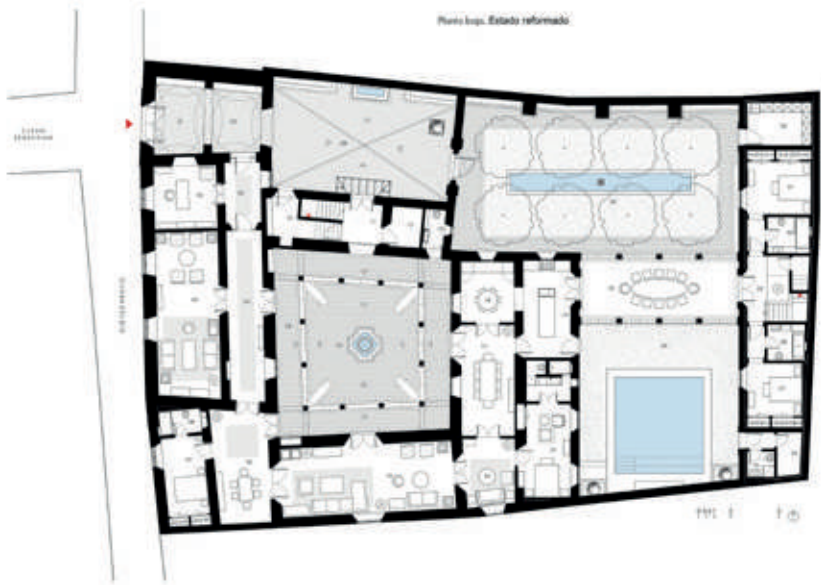
Roof plan after the intervention | Planta de cubiertas tras la intervención | *Planta de coberturas após a intervenção (Urbipac)*

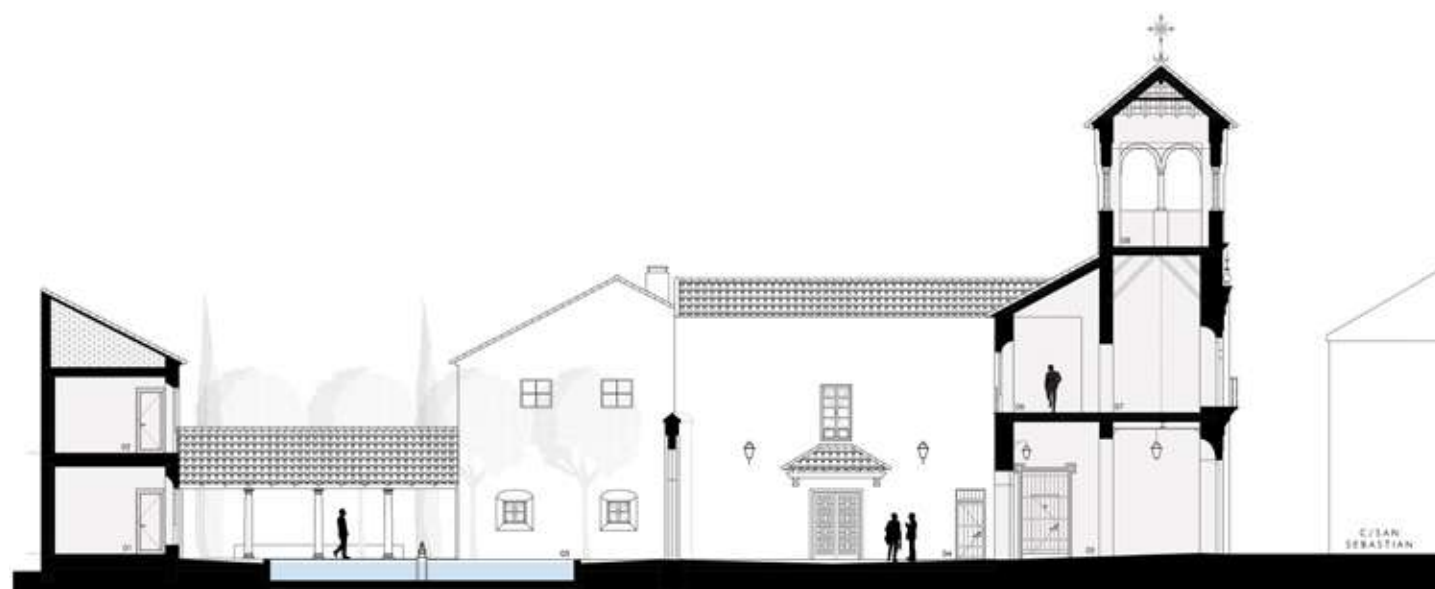


Upper floor plan after the intervention | Planta alta tras la intervención | *Planta do piso superior após a intervenção (Urbipac)*



Ground floor plan after the intervention | Planta baja tras la intervención | *Planta do piso térreo após a intervenção (Urbipac)*





toward the facade, and the other in the double east bay, toward the interior—as suites for the couple and their guests. The four remaining bedrooms, for the children, were to be provided in a new annex, with two rooms per floor, in the area of scant architectural value formerly occupied by sheds and henhouses by the east dividing wall. This solution serves the desired functional program, with new plumbing and sanitation facilities, while reinstating and dignifying the derelict rear of the plot. The new annexed volume, designed in keeping

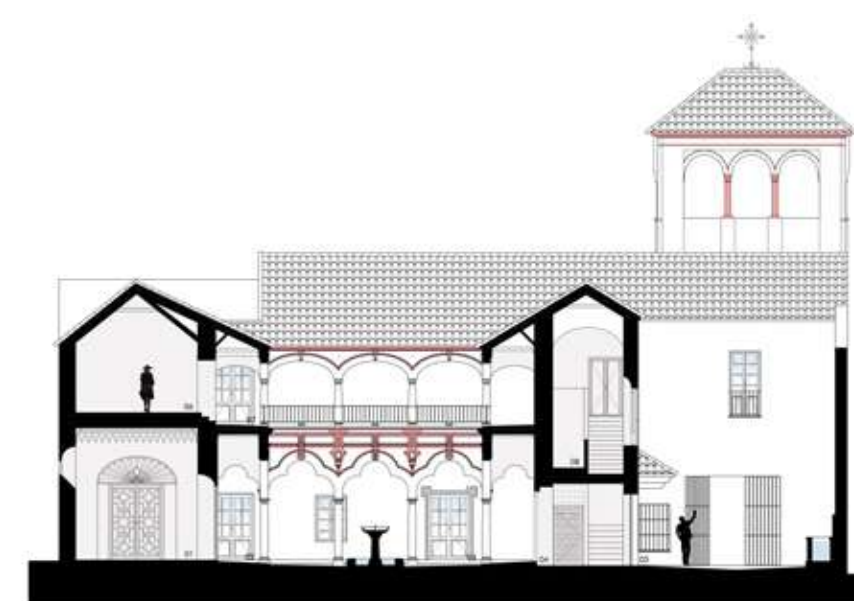
El criterio seguido para la actualización del programa ha consistido en destinar los dos dormitorios existentes –uno en la doble crujía oeste, hacia fachada, y otro en la doble crujía este, hacia el interior– a los espacios del matrimonio y los invitados. Los cuatro dormitorios restantes, destinados a los hijos, se han resuelto mediante la construcción de un pabellón anexo de nueva planta, con dos habitaciones por nivel, ubicado en el área que anteriormente ocupaban los antiguos cobertizos de gallineros, sin apenas valor arquitectónico, junto a la medianera este.

projeto consistiu em destinar os dois quartos existentes – um na ala dupla oeste, voltado para a fachada, e outro na ala dupla leste, voltado para o interior – aos espaços do casal e dos convidados. Os quatro quartos restantes, destinados aos filhos, foram solucionados através da construção de um pavilhão anexo, com dois quartos por piso, localizado na área anteriormente ocupada pelos antigos galinheiros, sem praticamente nenhum valor arquitetónico, junto à parede divisória leste. Com esta solução, por um lado, responde-se ao programa

with the overall style of the stately ensemble, serves also as a new partition for the divisions likely to be exposed by future construction in the adjoining municipal plot.

Con esta solución se da respuesta, por un lado, al programa funcional requerido, que incorpora nuevas instalaciones de fontanería y saneamiento; y, por otro, se recupera y dignifica el fondo de la parcela, asilvestrado y en estado de abandono. El nuevo volumen del pabellón actúa como una “piel” renovada que, gracias a un diseño respetuoso con el conjunto palaciego, resuelve con eficacia la relación con las medianeras que previsiblemente quedarán expuestas por las futuras edificaciones en la parcela municipal colindante.

funcional exigido, que incorpora novas instalações de canalização e saneamento; e, por outro, recupera-se e dignifica-se o fundo do terreno, que se encontrava num estado brávio e de abandono. O novo volume do pavilhão funciona como uma «pele» renovada que, graças a um design respeitador do conjunto palaciano, resolve eficazmente a relação com as paredes divisórias que ficarão previsivelmente expostas pelas futuras construções no terreno municipal adjacente.



< Longitudinal sections after the intervention |
Secciones longitudinales tras la intervención |
Cortes longitudinais após a intervenção (Urbipac)
> Transverse sections after the intervention |
Secciones transversales tras la intervención |
Cortes transversais após a intervenção (Urbipac)



1



2

1: Entrance corridor parallel to the columned courtyard 2: Antechamber to the grand hall | 1: Corredor de ingreso paralelo al patio de columnas 2: Antesala de la gran sala | 1: Corredor de entrada paralelo ao pátio das colunas 2: Antessala do grande salão (Fernando Alda)

Taking a tour from the main entrance—the grand gateway on Calle Lora—one enters the partially covered entrance yard, paved with traditional pebbling and leading to the hall approaching the double west bay. Here the program contains the office, living room or parlor, dining room, reading room, and guestroom, with ensuite bathroom. From the yard, through a magnificent example of an Écija door—with a direct frame, earlike corner ornaments with a central crest and richly carved twin panels—one reaches the main living room, connected with the vestibule of the master bedroom, also ensuite, with a dressing closet and views to the garden. The east bay is mostly given over to the dining room and kitchen. The whole functional layout is organized around a fine central courtyard with three arches, trefoil on the lower level and basket-handle above, with notable carved-brick ornaments. The paving in the middle combines limestone slabs laid diagonally from the corners with a central fountain also of limestone.

A través de un recorrido que comienza en el acceso principal, en la regia portada de la calle Lora, se entra en el apeadero cubierto, pavimentado con enchinado tradicional, que conduce al vestíbulo de ingreso a la doble crujía oeste. En esta se desarrolla el programa de despacho, sala de estar o recibo, comedor, antesala de lectura y dormitorio de invitados, este último en suite con baño incorporado. Desde este punto, y a través de un magnífico ejemplo de puerta ecijana – con bastidor directo, orejeras, copete y doble hoja ricamente tallada– se accede al gran salón de estar, que comunica con la antesala del dormitorio principal, también en suite, con vestidor y vistas al jardín. La crujía este se destina en su mayor parte a comedor y cocina. Todo el esquema funcional se organiza en torno al magnífico patio central de tres arcos: trilobulados en planta baja y carpaneles en planta alta, con un destacado tratamiento ornamental en ladrillo tallado. El pavimento del espacio a cielo abierto combina piezas pétreas de caliza colocadas en diagonal en las esquinas con una fuente central también de piedra caliza.

Através de um percurso que começa na entrada principal, na imponente fachada da rua Lora, entra-se no átrio coberto, pavimentado com pedras tradicionais, que conduz ao vestíbulo de entrada para o corredor duplo oeste. Neste espaço encontra-se o escritório, sala de estar ou recepção, sala de jantar, ante-sala de leitura e quarto de hóspedes, este último em suite e com casa de banho incorporada. A partir deste ponto, e através de um magnífico exemplo de porta Ecijana – com moldura direta, “orelhas decorativas”, lintel e folha dupla ricamente esculpida – acede-se à grande sala de estar, que comunica com a antecâmara do quarto principal, também em suite, com vestiário e vista para o jardim. A ala leste é destinada principalmente à sala de jantar e cozinha. Todo o esquema funcional está organizado em torno do magnífico pátio central de três arcos: trilobados no piso térreo e arcos do tipo sarapanel no piso superior, com um tratamento ornamental de destaque em tijolo esculpido. O pavimento do espaço ao ar livre combina peças de pedra calcária colocadas diagonalmente nos cantos, com uma fonte central também em pedra calcária.

Underfloor heating was installed throughout the ground floor with an air-source heat pump so as to efficiently and sustainably air-condition the ample, lofty rooms. The floors were paved with rustic bricks of 16 x 32 cm, laid in running strips at the perimeter and herringbone pattern in the middle. Passages and larger spaces will be laid with mats of natural sisal and esparto fiber on which furniture will be placed. The materials used are generally natural and local and none are mass-produced.

The facing walls were rendered and plastered with lime mortar, with a smooth finish also of lime. The existing doors were restored and their fittings and fastenings returned to working order. They were also given a coat of gray-green matt paint consistent with the previous colors, with the double door of the living room being taken as a reference. The new doors and all the

Se ha instalado suelo radiante en toda la superficie de la planta baja, alimentado mediante un sistema de aerotermia, con el objetivo de climatizar de forma eficiente y sostenible las grandes estancias de techos altos. La solería se ha ejecutado con ladrillo taco de tejar de 16 x 32 cm, colocado con encintado a soga en el perímetro y a la palma en las zonas centrales. En las zonas de tránsito de los corredores y en los espacios de mayores dimensiones se colocarán esteras de fibra natural de sisal y esparto, sobre las que irá dispuesto el mobiliario. En términos generales todos los materiales empleados son naturales y autóctonos, sin recurrir a piezas de catálogo.

Los paramentos se han enfoscado y enlucido con mortero de cal, lo que incluye una terminación final igualmente de enlucido de cal. Las puertas existentes han sido restauradas. Se ha intervenido en sus elementos de cuelgue y cierre para

Foi instalado piso radiante em toda a superfície do piso térreo, alimentado por um sistema de aerotermia, com o objetivo de climatizar de forma eficiente e sustentável as salas grandes com tetos altos. O pavimento foi executado com tijolos rústicos cozido de 16 x 32 cm, colocados com uma disposição dos tijolos de fiada longa no perímetro e de fiada à cabeça nas zonas centrais. Nas zonas de circulação dos corredores e nos espaços de maiores dimensões serão colocados tapetes de fibra natural de sisal e esparto, sobre os quais será disposto o mobiliário. De uma forma geral, todos os materiais utilizados são naturais e autóctones, não tendo sido utilizadas peças de catálogo.

Foi aplicado às paredes um emboço com argamassa de cal e um acabamento final igualmente com reboco de cal. As portas existentes foram restauradas, tendo-se intervindo nos seus elementos de suspensão e fecho para garantir o

Traditional 18th-century Écija-style door carved “a la chinesca”, leading to the grand hall. On the exterior it features a frame with “orejeras” and “copete”, while the interior side displays a plaster scallop shell above it | Puerta tradicional ecijana tallada a la chinesca del siglo XVIII que da acceso a la gran sala. En el extradós tiene un marco con “orejeras” y “copete” y en el intradós cuenta con una venera de yesería sobre ella | Porta tradicional de Écija, entalhada ao gosto chinês do século XVIII, que dá acesso ao grande salão. No extradós apresenta uma moldura com “orelhas” e “frontão” e no intradós uma vieira em estuque sobre ela (Fernando Alda)





1: View of the triple-arched columned courtyard with central fountain 2, 3: Details of the gargyle and the corner paving of the courtyard 4: Sebastián Pérez during the cleaning and restoration of the frescoes | 1: Vista del patio de columnas de triple arquería con fuente central 2, 3: Detalles de la gárgola y del pavimento de una esquina del patio de columnas 4: Sebastián Pérez durante el proceso de limpieza y restauración de los frescos | 1: Vista do pátio das colunas de tripla arcaria com fonte central 2, 3: Detalhes da gárgula e do pavimento de um canto do pátio 4: Sebastián Pérez durante o processo de limpeza e restauro dos frescos (1: Fernando Alda 2, 3: Alejandro García Hermida 4: Sebastián Pérez)



Connection between the main building and the new annex | Comunicación entre el edificio matriz y el edificio de nueva planta | Ligaçao entre o edificio principal e o novo anexo (Fernando Alda)

windows were closely modeled on the existing ones. New joinery was made in a woodshop using smooth whole molded planks.

As mentioned, the rest of the program, consisting of four bedrooms with ensuite bathrooms, was located in the new annex, accessed through a bridging space conceived in the manner of a gallery. This has four twin spans formed by six limestone columns supporting wooden beams under a collar-tie roof, with flat bricks laid on slats. This gallery, on a single level, is intended to serve as a summer dining place and a relational, articulatory space, transparent with the garden area, which has likewise been highlighted by the restoration.

garantizar su correcto funcionamiento. Igualmente, han recibido un acabado de pintura mate en tono gris verdoso, en consonancia con las ya presentes. Se ha tomado como referencia, en particular, la puerta de doble hoja del salón-estar. Las nuevas puertas, así como todas las ventanas, han seguido fielmente los modelos existentes. Las carpinterías de nueva ejecución han sido realizadas en taller, con tableros lisos enterizos y moldurados.

Como se ha señalado, el resto del programa, compuesto por cuatro dormitorios en suite con baño incorporado, se ubica en el pabellón de nueva planta, al que se accede a través de un “espacio-puente” concebido a modo de logia adintelada. Esta se compone de cuatro vanos dobles ejecutados con seis columnas de piedra caliza sobre las que descansan jácenas de madera, rematadas con una cubierta de par y nudillo, con ladrillos tendidos sobre tablas. La logia, de una sola planta, se ha diseñado con la intención de funcionar como “comedor de verano” y como espacio de relación, articulación y transparencia con el área ajardinada, que adquiere un nuevo protagonismo tras su recuperación.

seu correto funcionamento. Receberam também um acabamento de tinta mate em tom cinza esverdeado, em consonância com as já existentes, tendo como referência, em particular, a porta dupla da sala de estar. As novas portas, assim como todas as janelas, seguiram fielmente os modelos existentes. As novas peças de carpintaria foram realizadas em oficina, com painéis lisos de uma só peça e moldados.

Como já foi referido, o resto do plano, composto por quatro quartos em suite com casa de banho incorporada, está localizado no novo pavilhão, ao qual se acede através de um “espaço-ponte” concebido como uma lógia com lintel. Este é composto por quatro vãos duplos executados com seis colunas de pedra calcária sobre as quais repousam vigas de madeira, rematadas com uma cobertura de *par y nudillo*, com tijolos assentes sobre tábuas. A lógia, de um único piso, foi concebida com a intenção de funcionar como “sala de jantar de verão” e como espaço de relacionamento, articulação e transparência com a área ajardinada, que adquire um novo protagonismo após a sua recuperação.



1



2



3



4



5

1: View from the open carriage porch towards the garden 2: View from the porch towards the entrance 3: View from the entrance towards the porch 4: Wrought-iron gate between the porch and the garden 5: View from the vestibule towards the porch | 1: Vista del apeadero descubierto hacia el jardín 2: Vista del apeadero descubierto hacia la entrada 3: Vista de la entrada hacia el apeadero 4: Cancela de paso entre el apeadero y el jardín 5: Vista desde el vestíbulo hacia el apeadero | 1: Vista da cocheira descoberta em direção ao jardim 2: Vista da cocheira em direção à entrada 3: Vista da entrada em direção à cocheira 4: Grade de ferro entre a cocheira e o jardim 5: Vista do vestíbulo em direção à cocheira (1: Fernando Alda 2 a 5: Alejandro García Hermida)

The open spaces (the overgrown former livestock enclosures) were reorganized, starting from the entrance yard. This was paved with Cordoban pebbling and has a white limestone water trough against the left wall, opposite a canopy over a door leading to the stairs on the right, connected in turn with the courtyard of columns. From this yard, via the salvaged and restored original wrought-

Los espacios libres, que originalmente fueron corrales y áreas asilvestradas, se han reorganizado en un recorrido que se inicia en el apeadero descubierto. Este se ha pavimentado con empedrado cordobés de morrillo y cuenta con un pilón pétreo de caliza blanca adosado al muro de la izquierda, frente a un tejeroz que cobija la puerta de acceso a la escalera, situada a la derecha y comunicada, a su

Os espaços livres, que originalmente eram currais e áreas bravias, foram reorganizados num percurso que começa no átrio descoberto. Este foi pavimentado com pedra cordovesa de “morrillo” (pedra grande e arredondada do rio ou campo) e tem um pilar de pedra calcária branca encostado à parede da esquerda, em frente a um beiral que cobre a porta de acesso à escada, situada à direita, e que comunica,

iron gate crowned with a semi-circular arch, we reach what is known as the Water Canal Courtyard, reminiscent of the Generalife gardens in Granada. This is surfaced with ocher earth sifted and compacted with lime and edged with Cordoban pebble paving, and planted with eight bitter orange trees.

The north wall, with southerly exposure, is to be covered with *Plumbago auriculata* (blue jasmine). On the other side of the gallery is a courtyard centered around a pool conceived as an ornamental vernacular water feature. It has two jets and a shallow vessel for bathing, in the manner of a stepped *natatio*. The pool’s limewashed walls emerge from grassy turf with contrasting edging, as does the facade of the annex housing the four children’s rooms. This volume closes off the garden and gives visual continuity

vez, con el patio de columnas. Desde este apeadero, y tras atravesar el muro donde se instala la cancela original de medio punto, recuperada y restaurada, se accede al denominado Patio de la Acequia. Este cuenta con un pavimento de albero maestrante, cernido y compactado con cal, rodeado por un encintado y plantado con ocho naranjos amargos.

El paramento norte, expuesto al soleamiento del sur, se cubrirá con *Plumbago auriculata* (jazmín azul). Al otro lado de la logia se proyecta el patio de la alberca, concebido como un elemento hidráulico de raíz vernácula con carácter ornamental. Se ha diseñado con doble surtidor y un vaso de poca profundidad, apto para el baño, a modo de *natatio* escalonada. La alberca se emplaza en una superficie de grama, de la que emergen sus paramentos encalados,

por sua vez, com o pátio de colunas. A partir deste átrio, e depois de atravessar a parede onde se encontra o portão original em arco de meio ponto, recuperado e restaurado, chega-se ao chamado Pátio da Acequia. Este tem um pavimento de *albero maestrante* (pavimento tradicional de terra batida e cal) peneirado e compactado com cal, rodeado por um rebordo de pedra cordovesa e plantado com oito laranjeiras amargas.

A parede norte, exposta ao sol do sul, será coberta com *Plumbago auriculata* (jasmim azul). Do outro lado da lógia projeta-se o pátio da piscina, concebido como um elemento hidráulico de origem vernácula com caráter ornamental. Foi projetado com duas fontes e um tanque de pouca profundidade, adequado para o banho, como uma *natatio* escalonada. A piscina está localizada numa superfície

Courtyard of the irrigation channel and pool courtyard | Patio de la acequia y patio de la alberca | Pátio da levada e pátio da alberca (Alejandro García Hermida)



by filling in the existing dividing walls on the east side.

Typological analysis shows that the upper floor of the eighteenth-century edifice was not originally designed for residential use. This is evidenced chiefly by the vernacular character of the staircase, such as may be found in a *cortijo* farmstead, clearly set apart from the more “manorial” quarters. Its function was solely to allow sacks of grain to be carried up and down to and from the granaries and stores on the upper floor, which explains its proximity to and direct access from the exterior through the entrance yard.

con encintado de “cintas”, al igual que el plano de fachada del pabellón que alberga los cuatro dormitorios destinados a los hijos. Este volumen cierra el jardín y proporciona continuidad visual mediante un “empaste” con las medianeras existentes en la tapia este.

Del análisis tipológico se deduce que la planta alta del edificio del siglo XVIII no fue concebida originalmente como un espacio destinado a uso residencial. Esta conclusión se evidencia, principalmente, en el carácter vernáculo de la escalera, propia de un “cortijo” y claramente desvinculada de la zona noble del “señorío”. Su función era exclusivamente la de permitir el tránsito vertical necesario para transportar sacos de grano

relvada, da qual emergem as suas paredes caiadas, com alvenaria com faixas de cal, tal como a fachada do pavilhão que alberga os quatro quartos destinados aos filhos. Este volume fecha o jardim e proporciona continuidade visual através de um «preenchimento» com as paredes divisórias existentes no muro leste.

Da análise tipológica conclui-se que o andar superior do edifício do século XVIII não foi originalmente concebido como um espaço destinado a uso residencial. Esta conclusão é evidenciada, principalmente, pelo caráter vernáculo da escada, típico de um *cortijo* (moradia rural tradicional) e claramente desvinculada da zona nobre do “senhorio”. A sua função era exclusivamente permitir o trânsito

Courtyard of the irrigation channel with the new pavilion in the background and the connecting gallery between buildings on the right | Patio de la acequia con el nuevo pabellón al fondo y la galería de comunicación entre edificios a la derecha | Pátio da levada com o novo pavilhão ao fundo e a galeria de ligação entre edifícios à direita (Alejandro García Hermida)



Analysis of the premises used as granaries on the east, west, and south sides as well as of the staircase led to the conclusion that their large volumes (with traditional collar-beam roofs), along with their lack of insulation and distance from the main suites, made it advisable merely to consolidate their structure. This involved repairing the tiled roofs, once waterproofed and insulated, plastering the walls, restoring the flooring, and installing basic water, electricity, and sanitation facilities. These spaces may then be fitted out for occasional private uses—library, gym, meeting room, showroom, etc.—in a second project phase.

hasta los graneros y almacenes ubicados en la planta superior, lo que explica su proximidad y acceso directo desde el exterior, a través del apeadero.

A partir del análisis de los espacios destinados a graneros, ubicados al este, oeste y sur, y del estudio de la escalera, se concluye que tanto la gran volumetría de estos ámbitos (con cubiertas tradicionales de par y nudillo), como sus limitadas condiciones de confort térmico y la considerable distancia hasta sus accesos, aconsejan realizar en ellos una intervención de consolidación estructural de manera exclusiva. Esta actuación comprende la reparación de las cubiertas de teja, tras haber sido impermeabilizadas y aisladas, el enfoscado de paramentos, el resanado de la solería y la dotación de las infraestructuras básicas de agua, electricidad y saneamiento. De este modo se posibilitará en el futuro su acondicionamiento como espacios complementarios destinados a usos esporádicos y de carácter privado, tales como biblioteca, sala de ejercicios, reuniones o *showroom*, en una segunda fase de intervención.

vertical necessário para transportar sacos de grão até aos celeiros e armazéns localizados no piso superior, o que explica a sua proximidade e acesso direto a partir do exterior, através do átrio.

A partir da análise dos espaços destinados a celeiros, localizados a leste, oeste e sul, e do estudo da escada, conclui-se que tanto o grande volume destas áreas (com coberturas tradicionais de *par y nudillo*), como as suas condições limitadas de conforto térmico e a distância considerável até aos seus acessos, aconselham a realização de uma intervenção de consolidação estrutural exclusiva. Esta intervenção incluiu a reparação dos telhados, após terem sido impermeabilizados e isolados, o reboco das paredes, a reparação do pavimento e a instalação das infraestruturas básicas de água, eletricidade e saneamento. Desta forma, será possível no futuro o seu acondicionamento como espaços complementares destinados a usos esporádicos e de caráter privado, tais como biblioteca, sala de exercícios, reuniões ou *showroom*, numa segunda fase de intervenção.

1: Staircase with brick treads and nosings 2: Intermediate landing with a double arch to prevent head clearance issues 3: Section of the stairway leading to the granary | 1: Escalera con huellas de ladrillo y mampelanes 2: Meseta intermedia de la escalera con doble arco para evitar “cabezada” 3: Tramo de subida a granero | 1: Escada com degraus em tijolo e bocais 2: Patamar intermédio com duplo arco para evitar “cabezada” 3: Lanço de subida ao celeiro (Fernando Alda)





Granary with tie-beam trusses and “brick laid flat” roofing, with adjoining circulation spaces | Granero con cubierta de cerchas atirantadas y “ladrillos tendidos por tabla” y tránsitos anexos | Celeiro com cobertura de asnas atirantadas e “tijolos colocados por prancha” e circulações anexas (Fernando Alda)

In summary, the new residential program was implemented on the ground floor after a refurbishment involving the removal of unsuitable alterations and the repair of damage in the original walls. A new annex was built at the rear of the plot to house bedrooms. The rehabilitation of the upper floor, originally intended for granaries, has been left for a second phase, which will preserve the distinctive spatial character of these rooms, to be given over to special uses following structural consolidation and installation of the necessary facilities.

En síntesis, el nuevo programa habitacional se desarrolla íntegramente en planta baja, tras un proceso de puesta en valor que incluye la eliminación de adulteraciones y la solución de patologías presentes en la arquitectura muraria original. También se ha construido un pabellón de nueva planta en el fondo este de la parcela, destinado a albergar dormitorios. La intervención en la planta alta, concebida originalmente como espacio de graneros, se ha reservado para una segunda fase. En ella se conservará la singularidad espacial de estos ámbitos, que serán destinados a usos específicos una vez se complete su consolidación estructural y se incorporen las infraestructuras necesarias.

Em resumo, o novo programa habitacional desenvolve-se inteiramente no piso térreo, após um processo de valorização que inclui a eliminação de adulterações e a resolução de patologias presentes na arquitetura original das paredes. Também foi construído um pavilhão novo na parte posterior leste do terreno, destinado a abrigar quartos. A intervenção no piso superior, originalmente concebido como espaço para celeiros, foi reservada para uma segunda fase. Nela será preservada a singularidade espacial destas áreas, que serão destinadas a usos específicos assim que a sua consolidação estrutural estiver concluída e as infraestruturas necessárias forem incorporadas.

Biographies | Biografías | Biografias

Fernando Martín Sanjuán

After studying at the Barcelona School of Architecture, Fernando took a master’s course in architectural design at the Center for Advanced Architecture in the Camuñas Foundation (Madrid). He practiced initially in La Coruña, in partnership with Arturo López de la Osa, and then returned to his hometown, Écija, where he founded a firm with Javier Madero and José Oliva, with whom he designed many projects. Later he worked as advisory architect to the Seville Institute of Architects and was editor and cofounder together with Pedro Gorgolas of the Institute’s journal *Neutra*. He also directed the Historic Center Department and served as rapporteur on the Écija Town Council Heritage Committee. He is a member of the Écija Vélez de Guevara Royal Academy of Sciences, Fine Arts, and Literature, of which he is also currently deputy chair. His most notable projects on Spanish listed cultural heritage sites (BIC) include the remodeling and adaptation of the eighteenth-century Benamejí Palace for use as a museum and a master plan for the Royal Alcazar parade ground, both in Écija, along with a master plan for El Hierro Castle in Fuentes de Andalucía. He is recognized for his ability to integrate new buildings into historic contexts. In 2020 he was awarded the 9th Rafael Manzano Prize.

Estudió Arquitectura en la Escuela de Arquitectura de Barcelona y cursó el Máster en Proyectos Arquitectónicos en el Centro Superior de Arquitectura de la Fundación Camuñas, en Madrid. Tras su primera experiencia profesional en La Coruña, asociado con Arturo López de la Osa, regresó a su ciudad natal, Écija. Allí fundó un estudio junto a Javier Madero y José Oliva, con quienes realizó numerosas obras. Más adelante trabajó como arquitecto asesor del Colegio de Arquitectos de Sevilla y fue director y cofundador, junto con Pedro Gorgolas, de la revista colegial *Neutra*. Ejerció también como director del Departamento de Casco Histórico y fue ponente en la Comisión de Patrimonio del Excmo. Ayuntamiento de Écija. Es miembro de número de la Real Academia de Ciencias, Bellas Artes y Buenas Letras “Vélez de Guevara” de Écija, institución de la que actualmente es vicepresidente. Entre sus obras más destacadas figuran proyectos con catalogación BIC, como la remodelación y adaptación del Palacio de Benamejí (siglo XVIII) para uso museístico, y el Plan Director de la Plaza de Armas del Alcázar, ambos en Écija, así como el Plan Director del Castillo del Hierro en Fuentes de Andalucía. Es reconocido por su capacidad para integrar nuevas edificaciones en contextos históricos. En 2020 fue galardonado con el IX Premio Rafael Manzano de Nueva Arquitectura Tradicional.

Estudou Arquitetura na Escola de Arquitetura de Barcelona e fez o Mestrado em Projetos Arqitetónicos no Centro Superior de Arquitetura da Fundação Camuñas, em Madrid. Após a sua primeira experiência profissional na Corunha, juntamente com Arturo López de la Osa, regressou à sua cidade natal, Écija. Lá, fundou um estúdio com Javier Madero e José Oliva, com quem realizou inúmeras obras. Mais tarde, trabalhou como arquiteto consultor do Colégio de Arquitetos de Sevilha e foi diretor e cofundador, juntamente com Pedro Gorgolas, da revista colegial *Neutra*. Foi também diretor do Departamento do Centro Histórico e foi relator na Comissão do Património da Câmara Municipal de Écija. É membro titular da Real Academia de Ciências, Belas Artes e Letras “Vélez de Guevara” de Écija, instituição da qual é atualmente vice-presidente. Entre as suas obras mais destacadas figuram projetos com classificação BIC, como a remodelação e adaptação do Palácio de Benamejí (século XVIII) para uso museológico e o Plano Diretor da Praça de Armas do Alcázar, ambos em Écija, bem como o Plano Diretor do Castillo del Hierro em Fuentes de Andalucía. É reconhecido pela sua capacidade de integrar novas construções em contextos históricos. Em 2020 foi galardoado com o IX Prémio Rafael Manzano de Nova Arquitetura Tradicional.

José Luis Pérez Hidalgo

Born in Écija (Seville province) in 1991, José Luis graduated in architecture at Seville University in 2017, specializing in architecture and heritage. He began practicing in his hometown, leading a studio with a multidisciplinary team in partnership with his mentor, the architect Fernando Martín Sanjuán, winner of the 9th Rafael Manzano Prize for Traditional Architecture. His most notable projects include the rehabilitation and restoration of a stately house in Fuentes de Andalucía and the restoration of the Bernabé y Madero Mansion in El Puerto de Santa María, both exemplars of traditional eighteenth-century Andalusian urban architecture. He contributed to the master plan for El Hierro Castle in Fuentes de Andalucía, rewarded in a competition in 2018. Currently his professional practice focuses largely on projects concerning built heritage, ranging from houses (public and private) to buildings for public use.

Nacido en Écija (Sevilla) en 1991, es arquitecto por la Universidad de Sevilla desde 2017, con especialidad en Arquitectura y Patrimonio. Inició su actividad profesional en su ciudad natal, al frente de un estudio acompañado por un equipo técnico multidisciplinar y en colaboración con su mentor, el arquitecto Fernando Martín Sanjuán, IX Premio Rafael Manzano de Nueva Arquitectura Tradicional. Entre sus obras más destacadas figuran la rehabilitación y restauración de una casa señorial del siglo XVIII en Fuentes de Andalucía y la restauración de la Casa-Palacio Bernabé Madero (siglo XVIII) en El Puerto de Santa María, ambas representativas de la arquitectura urbana tradicional andaluza. Colaboró en la redacción del Plan Director del Castillo del Hierro, en Fuentes de Andalucía, proyecto galardonado en concurso en 2018. En la actualidad su práctica profesional se centra mayoritariamente en intervenciones sobre el patrimonio construido, lo que abarca tanto viviendas –públicas y privadas– como edificios de carácter dotacional.

Nascido em Écija (Sevilha) em 1991, é arquiteto pela Universidade de Sevilha desde 2017, com especialização em Arquitetura e Património. Iniciou a sua atividade profissional na sua cidade natal, à frente de um estúdio acompanhado por uma equipa técnica multidisciplinar e em colaboração com o seu mentor, o arquiteto Fernando Martín Sanjuán, IX Prémio Rafael Manzano de Nova Arquitetura Tradicional. Entre as suas obras mais destacadas estão a reabilitação e restauração de uma casa senhorial do século XVIII em Fuentes de Andalucía e a restauração da Casa-Palácio Bernabé Madero (século XVIII) em El Puerto de Santa María, ambas representativas da arquitetura urbana tradicional andaluza. Colaborou na elaboração do Plano Diretor do Castillo del Hierro, em Fuentes de Andalucía, projeto premiado em 2018. Atualmente, a sua prática profissional centra-se principalmente em intervenções no património construído, o que abrange tanto habitações – públicas e privadas – como edifícios de cariz dotacional.

Vanderbilt University's West End Residential Colleges

Los colegios mayores del West End
de la Universidad de Vanderbilt

Os colégios residenciais de West End da
Universidade Vanderbilt

Gregory Hoss,
Steve Knight,
David M. Schwarz
Architects

Vanderbilt University Residential
College Master Plan & E. Bronson
Ingram College

Masterplan de los colegios mayores
de la Universidad de Vanderbilt y E.
Bronson Ingram College

Master plan dos Residential Colleges da
Universidade Vanderbilt e E. Bronson
Ingram College

Mission

When Vanderbilt University commissioned David M. Schwarz Architects (DMSAS) to undertake a residential master plan in 2003, the institution was in flux. Nashville was emerging as one of America's fastest growing cities and Vanderbilt's educational and research reputation was attracting students and faculty from around the world. The university was seeking to create a more diverse, engaging, and scholarly community and its leadership saw that the campus's

Propósito

Cuando la Universidad de Vanderbilt encargó a David M. Schwarz Architects (DMSAS) la elaboración de un masterplan residencial en 2003, la institución se encontraba en un momento de transformación. Nashville empezaba a consolidarse como una de las ciudades de mayor crecimiento de Estados Unidos, y el prestigio académico e investigador de Vanderbilt atraía a estudiantes y profesores de todo el mundo. La universidad aspiraba a crear una comunidad más diversa, estimulante

Propósito

Quando a Universidade Vanderbilt contratou a David M. Schwarz Architects (DMSAS) para elaborar um plano diretor residencial em 2003, a instituição estava em plena transformação. Nashville estava a emergir como uma das cidades que mais cresciam nos Estados Unidos, e a reputação da Vanderbilt em educação e investigação atraía estudantes e professores de todo o mundo. A universidade procurava criar uma comunidade mais diversificada, atrativa e erudita, e a sua direção percebeu que



< Tower of E. Bronson Ingram College | Torre de E. Bronson Ingram College | Torre do E. Bronson Ingram College (Steve Hall)

> Masterplan for the Vanderbilt University's residential colleges | Masterplan para los colegios mayores de la Universidad Vanderbilt | Masterplan para os colégios residenciais da Universidade Vanderbilt

utilitarian post-war dormitories were no longer an appropriate setting for their ambitious mission. Over a year-long dialogue, we and the university explored designs for living-learning environments that might nurture new generations of leaders.

Vision

While Vanderbilt was competing with the nation's top-tier schools, it also faced a surge of market-rate multifamily developments throughout Nashville. The university needed a competitive residential offering. Among the precedents for undergraduate housing, it became clear that a more holistic environment such as those at Oxford and many Ivy League institutions—“residential colleges”—was the right model. A typical residential college houses diverse students (including graduates), faculty, classrooms, formal and informal study/lounge spaces, and often dining halls and courtyard gathering/recreation spaces. The college system allows students to stay in one residential community for the length of their undergraduate career and its configuration generates smaller groups that foster valuable lifelong friendships.

y comprometida con el estudio, y su dirección reconocía que las residencias utilitarias de posguerra ya no ofrecían un marco adecuado para esa misión ambiciosa. A lo largo de un año nuestro equipo y la universidad estudiaron diseños de entornos residenciales y académicos que favorecieran la formación de una nueva generación de líderes.

Enfoque

Mientras la Universidad de Vanderbilt competía con las instituciones más prestigiosas del país, también enfrentaba el auge de nuevas promociones residenciales privadas en Nashville. La universidad necesitaba ofrecer un modelo de alojamiento competitivo. Entre los precedentes de residencias universitarias, resultó evidente que un entorno uniforme, como los de Oxford o varias universidades de la Ivy League – los llamados *residential colleges* –, representaba el modelo adecuado. Un colegio mayor de este tipo acoge a estudiantes diversos (incluidos posgraduados), profesorado, aulas, espacios formales e informales de estudio o descanso, y con frecuencia comedores y patios concebidos para la convivencia y el esparcimiento. Este sistema permite que los estudiantes permanezcan en una misma comunidad residencial durante toda su formación universitaria, y su configuración propicia grupos reducidos que facilitan la creación de vínculos personales duraderos.

os dormitórios utilitários do campus, construídos no pós-guerra, já não eram um ambiente adequado para a sua ambiciosa missão. Ao longo de um diálogo que durou mais de um ano, nós e a universidade explorámos designs para ambientes de vida-aprendizagem que pudessem formar novas gerações de líderes.

Visão

Enquanto a Vanderbilt competia com as melhores escolas do país, também enfrentava um aumento repentino de empreendimentos multifamiliares a preço de mercado em toda a cidade de Nashville. A universidade precisava de uma oferta residencial competitiva. Entre os precedentes para alojamento de estudantes universitários, tornou-se claro que um ambiente mais holístico, como o de Oxford e de muitas instituições da Ivy League – os “colégios residenciais” – era o modelo certo. Um colégio residencial típico abriga diversos alunos (incluindo graduados), professores, salas de aula, espaços formais e informais de estudo/lazer e, muitas vezes, refeitórios e pátios para reuniões/entretenimento. O sistema universitário permite que os alunos permaneçam em uma comunidade residencial durante todo o seu percurso de graduação, e sua configuração permite o surgimento de grupos menores que promovem amizades valiosas para toda a vida.

The 2003 master plan envisioned up to twenty new colleges across the campus for upward of 6,400 students. As students’ success in college is often determined by their freshman experience, the Peabody site, previously a teachers’ college, was chosen for one large freshman college housing 1,600 students and a dining hall. We developed a plan for it combining eight new residential buildings with six existing dormitories, configured around three courtyards. A further fourteen colleges for sophomores, juniors, and seniors were planned for the main campus in place of existing dormitories and on underutilized campus sites.

El masterplan de 2003 preveía la construcción de hasta veinte nuevos colegios mayores en el campus, destinados a más de 6.400 estudiantes. Dado que el éxito académico suele depender de la experiencia del primer año, se eligió el emplazamiento de Peabody – antiguo colegio de formación del profesorado – para albergar un gran colegio mayor de estudiantes de primer curso, con capacidad para 1.600 alumnos y un comedor. Diseñamos una propuesta que combinaba ocho nuevos edificios residenciales con seis residencias existentes, organizados en torno a tres patios. Además, se planificaron otros catorce colegios mayores para estudiantes de segundo, tercer y cuarto año, situados en el campus principal, en sustitución de residencias previas y en terrenos escasamente aprovechados.

O plano diretor de 2003 previa até vinte novos colégios em todo o campus para mais de 6.400 alunos. Como o sucesso dos alunos no colégio é frequentemente determinado pela sua experiência no primeiro ano, o local onde se situava o colégio Peabody para a formação de professores foi escolhido para a criação de um grande colégio destinado ao primeiro ano com capacidade para 1.600 alunos e um refeitório. Desenvolvemos o seu plano combinando oito novos edifícios residenciais com seis dormitórios pré-existent, configurados em torno de três pátios. Outros catorze colégios para alunos do segundo, terceiro e quarto anos foram projetados para o campus principal, no lugar dos dormitórios pré-existent e em locais subutilizados do campus.

Elevation of the different residential colleges | Alzado de los distintos colegios mayores | Alçado dos diferentes colégios residenciais



Axonomic view of the residential colleges along West End Avenue | Vista axonométrica de los colegios mayores a lo largo de West End Avenue | Vista axonométrica dos colégios residenciais ao longo da West End Avenue



Ingram Commons, the freshman college on the Peabody campus, was built in 2005-2012, along with the first two main campus colleges, Moore and Warren, designed by other architects. By 2013 the university was able to expand its vision as Chancellor Nick Zeppos had built a consensus for the residential college plan (with a premium cost per bed, given their associated amenities, over that of a normal dormitory) and his Board Chair, Martha Ingram, offered to lead the philanthropic effort to fund these projects. Her one stipulation was that she be able to work with David M. Schwarz Architects, whom she had commissioned to design concert halls for the Nashville Symphony and the City of Charleston.

Ingram Commons, el colegio mayor para estudiantes de primer curso en el campus de Peabody, se construyó entre 2005 y 2012, junto con los dos primeros colegios del campus principal, Moore y Warren, diseñados por otros arquitectos. En 2013 la universidad pudo ampliar su proyecto gracias a que el rector Nick Zeppos había conseguido consensuar un plan para los colegios mayores – con un coste por plaza superior al de una residencia convencional, debido a los servicios y espacios comunes asociados –, y a que la presidenta del consejo, Martha Ingram, se ofreció a liderar la campaña filantrópica destinada a financiar las nuevas construcciones. Su única condición fue poder colaborar con David M. Schwarz Architects, el mismo estudio al que había encargado el diseño de las salas de conciertos de la Sinfónica de Nashville y de la ciudad de Charleston.

O Ingram Commons College para alunos do primeiro ano no campus Peabody, foi construído entre 2005 e 2012, juntamente com os dois primeiros colégios do campus principal, Moore e Warren, projetados por outros arquitetos. Em 2013, a universidade conseguiu expandir a sua visão, uma vez que o reitor Nick Zeppos conseguiu um consenso para o plano do colégio residencial (com um custo premium por cama, devido aos serviços associados, superior ao de um dormitório normal) e a presidente do conselho, Martha Ingram, ofereceu-se para liderar o esforço filantrópico para financiar esses projetos. A sua única condição era poder trabalhar com a David M. Schwarz Architects, que tinha contratado para projetar salas de concerto para a Nashville Symphony e a cidade de Charleston.

Planning Goals

DMSAS was asked to design a conceptual plan for ten new residential colleges along West End Avenue. The initial idea was to raze several underutilized plots, relocating suburban-style Greek houses to denser rowhouses and creating a series of colleges configured around quadrangles. This proved a bit too ambitious, particularly for alumni from the fraternities and sororities, so a modified plan was developed to meet the university’s most pressing needs, including the demolition of four brutalist 1960s towers.

The 2013 DMSAS residential college master plan places new colleges along the western edge of the Vanderbilt campus. The four new colleges facing West End Avenue communicate a more earnest and timeless message about the university, while their visually rich architecture gives the campus new character.

Objetivos

DMSAS recibió el encargo de elaborar un plan conceptual para diez nuevos colegios mayores a lo largo de West End Avenue. La idea inicial consistía en demoler las construcciones de varios solares poco aprovechados, reubicar las casas de las fraternidades en edificios adosados de mayor densidad y crear una serie de colegios organizados en torno a patios cuadrangulares. Este planteamiento resultó algo excesivo, especialmente para los antiguos miembros de las fraternidades y hermandades universitarias, por lo que se desarrolló una versión modificada destinada a atender las necesidades más urgentes de la universidad, incluida la demolición de cuatro torres brutalistas de la década de 1960.

El masterplan de colegios mayores elaborado por DMSAS en 2013 sitúa los nuevos edificios a lo largo del límite occidental del campus de Vanderbilt. Los cuatro colegios que se orientan hacia West End Avenue expresan una imagen más seria y perdurable de la universidad, mientras que su arquitectura, rica en matices, aporta un carácter renovado al campus.

Objetivos de planeamento

A DMSAS foi convidada a delinear um plano concetual para dez novos colégios residenciais ao longo da West End Avenue. A ideia inicial era demolir vários terrenos subutilizados, transferindo as casas das fraternidades suburbanas para casas geminadas mais densas e criando uma série de colégios organizados em torno de pátios quadriláteros. Isso revelou-se um pouco ambicioso demais, especialmente para os antigos alunos das fraternidades e irmandades, tendo-se então desenvolvido um plano modificado que fosse de encontro às necessidades mais urgentes da universidade, incluindo a demolição de quatro torres brutalistas da década de 1960.

O plano diretor do colégio residencial DMSAS para 2013 prevê a construção de novos colégios ao longo da extremidade oeste do campus da Vanderbilt. Os quatro novos colégios que dão para a West End Avenue transmitem uma mensagem mais séria e atemporal sobre a universidade, enquanto a sua arquitetura visualmente rica confere um novo caráter ao campus.

Pencil and coloured sketches of E. Bronson Ingram College | Bocetos a lápiz y a color de E. Bronson Ingram College | Esboços a lápis e a cores de E. Bronson Ingram College



Architecture

The Vanderbilt campus has a plethora of architectural styles, which prompted earnest discussion about what language might best represent these aspirations. To consider how other universities had used architecture to communicate their ideals and to generate a common language with the client, we organized campus tours around the United States for the Chancellor and his board. Afterward the Chancellor commented, “I was continuously struck by the prevalence of traditional architecture in these storied institutions. Many of the buildings appeared old and weathered. Even if they were relatively new, they seemed rooted in the early history

Arquitetura

El campus de Vanderbilt presenta una gran diversidad de estilos arquitectónicos, lo que suscitó un debate profundo sobre cuál sería el lenguaje más adecuado para expresar las aspiraciones del proyecto. Con el propósito de analizar cómo otras universidades habían utilizado la arquitectura para comunicar sus ideales y establecer un lenguaje común con el cliente, organizamos visitas a distintos campus universitarios de Estados Unidos para el rector y su consejo. Después de esas visitas, el rector comentó: “Me impresionó la presencia constante de la arquitectura tradicional en esas instituciones con tanta historia. Muchos edificios parecían antiguos y

Arquitetura

O campus da Vanderbilt possui uma grande variedade de estilos arquitetônicos, o que suscitou uma discussão séria sobre qual linguagem poderia melhor representar essas aspirações. Para analisar como outras universidades utilizaram a arquitetura para comunicar os seus ideais e criar uma linguagem comum com o cliente, organizamos visitas a campi pelos Estados Unidos, para o reitor e o seu conselho. Como resultado, o reitor comentou: “Fiquei continuamente impressionado com a prevalência da arquitetura tradicional nessas instituições históricas. Muitos dos edifícios pareciam antigos e desgastados. Mesmo que fossem relativamente novos, pareciam enraizados



E. Bronson Ingram College from the exterior | E. Bronson Ingram College visto desde el exterior | E. Bronson Ingram College visto do exterior (Steve Hall)



Inner courtyard of E. Bronson Ingram College | Patio interior de E. Bronson Ingram College | Pátio interno de E. Bronson Ingram College (Steve Hall)

of higher education”. He and Martha Ingram knew the power of a good story and were captivated by the history of Gothic architecture developed from the Cistercian monasteries to the early English secular colleges and then to the most respected American universities. This style, known as Collegiate Gothic, of which Vanderbilt already had good examples, was chosen for the new colleges.

E. Bronson Ingram College

“EBI,” as it is commonly referred to by students, is the first of the four colleges and significantly located. The north side anchors the historical campus entrance; the east side faces two of the campus’s most historic buildings, leaving space for a north-south pedestrian thoroughfare; the south side gives onto Alumni Lawn, a treasured space where graduation is held every May; and the west side fronts the neighborhood on West End Avenue.

The design was conceived to subdivide the population of 340 undergraduates into more intimate groups. The college contains two “houses,” and the plan and aesthetic configure what appears

erosionados por el tiempo; incluso los más recientes daban la impresión de estar arraigados en los orígenes de la educación superior”. Tanto él como Martha Ingram comprendían el poder de una buena narrativa y se sintieron atraídos por la historia de la arquitectura gótica, desde los monasterios cistercienses hasta los primeros colegios seculares ingleses y, más tarde, las universidades más prestigiosas de Estados Unidos. Ese estilo, conocido como *Collegiate Gothic*, del que Vanderbilt ya contaba con buenos ejemplos, fue el elegido para los nuevos colegios.

E. Bronson Ingram College

“EBI,” como lo llaman habitualmente los estudiantes, es el primero de los cuatro colegios y ocupa un emplazamiento de gran relevancia. Su lado norte marca el acceso histórico al campus; el lado este se orienta hacia dos de los edificios más antiguos de la universidad, lo que deja un espacio libre para un eje peatonal norte-sur; el lado sur se abre al Alumni Lawn, un espacio emblemático donde cada mes de mayo se celebra la ceremonia de graduación; y el lado oeste da frente al barrio situado junto a West End Avenue.

El diseño se concibió con el propósito de dividir a los 340 estudiantes de grado en grupos más reducidos e íntimos. El

na história inicial do ensino superior”. Ele e Martha Ingram conheciam o poder de uma boa história e ficaram fascinados pela história da arquitetura gótica que se tinha desenvolvido a partir dos mosteiros Cistercienses e chegou até aos primeiros colégios seculares Ingleses e, depois, às universidades Americanas mais respeitadas. Esse estilo, conhecido como *Collegiate Gothic*, do qual a Vanderbilt já tinha bons exemplos, foi escolhido para os novos colégios.

E. Bronson Ingram College

O “EBI,” como é habitualmente chamado pelos estudantes, é o primeiro dos quatro colégios e ocupa um local de grande relevância. O lado norte fica na entrada histórica do campus; o lado leste fica de frente para dois dos edifícios mais históricos do campus, deixando espaço para uma via pedonal norte-sul; o lado sul dá para o Alumni Lawn, um espaço precioso onde a graduação é realizada todos os meses de Maio; e o lado oeste fica de frente para o bairro na West End Avenue.

O design tinha em vista a subdivisão da população de 340 estudantes universitários em grupos mais íntimos.



1: View of the two buildings in Victorian Gothic and Collegiate Gothic styles 2: Elevation of the Victorian Gothic building | 1: Vista de los dos edificios en los estilos neogótico victoriano y Collegiate Gothic 2: Alzado del edificio de estilo neogótico victoriano | 1: Vista dos dois edificios nos estilos neogótico vitoriano e Collegiate Gothic 2: Alçado do edifício de estilo neogótico vitoriano (Steve Hall)

> Courtyard and details of the Victorian Gothic building at E. Bronson Ingram College | Patio y detalles del edificio de estilo neogótico victoriano de E. Bronson Ingram College | Pátio e detalhes do edifício neogótico vitoriano de E. Bronson Ingram College (Steve Hall)



to be two buildings with distinct architectures—Victorian Gothic, in line with Kirkland Hall, the university’s main historic building, and Collegiate Gothic, inspired by the adjacent Alumni Hall. From the foyer, students navigate a courtyard laid out to encourage them to walk through exterior portals into their house quadrangle and up one of the six light-filled stairs directly to their tier. Thus the 340 students become groups

colegio se organiza en dos “casas”, y tanto la planta como el lenguaje arquitectónico crean la apariencia de dos edificios con estilos diferenciados: uno de inspiración neogótica victoriana, en sintonía con Kirkland Hall, el edificio histórico principal de la universidad, y otro de estilo Collegiate Gothic, inspirado en el vecino Alumni Hall. Desde el vestíbulo los estudiantes acceden a un patio que los invita a atravesar pórticos exteriores

O colégio inclui duas “casas”, e o traçado e estética fazem parecer que se tratam de dois edifícios com arquiteturas distintas – Gótico Vitoriano, em consonância com o Kirkland Hall, o principal edifício histórico da universidade, e Collegiate Gothic, inspirado no Alumni Hall adjacente. A partir do foyer, os estudantes deslocam-se por um pátio cuja disposição os encoraja a atravessar portais exteriores rumo ao pátio da sua residência, e a subir

of about twelve by the time they arrive at their room cluster.

DMSAS studied Collegiate Gothic buildings around the world to consider how a combination of massing, window placement, materials, and details might be recombined to create a “Vanderbilt Gothic.” A local sandstone (*Crab Orchard*) was used in the facades to give a handcrafted feel. Architectural

hacia el claustro de su casa y subir por una de las seis escaleras iluminadas hasta su nivel. De este modo los 340 residentes se agrupan finalmente en núcleos de unas doce personas al llegar a sus habitaciones.

DMSAS estudió edificios de estilo Collegiate Gothic en distintos lugares del mundo para analizar cómo la combinación de volúmenes, la disposición de ventanas, los materiales y los detalles podían

uma das seis escadarias luminosas, com acesso direto ao seu andar. Assim, ao chegar ao seu bloco residencial, os 340 alunos organizam-se em grupos de cerca de 12.

A DMSAS estudou edifícios em estilo Collegiate Gothic por todo o mundo para considerar como uma combinação de volumetria, posicionamento das janelas, materiais e detalhes poderia



the dining room gives prominently onto Alumni Lawn.

The EBI interior was designed to create a timeless and inviting series of public and private gathering spaces. The mahogany-lined dining hall and voluminous Great Room evoke the venerable libraries that fostered scholarship in times past. The building also houses several graduate students, faculty, a classroom, and a dance studio. Student lounges, study rooms, and small kitchens are sprinkled through the upper floors as quieter spaces for study or gathering.

entorno: un amplio retranqueo en la fachada norte permitió conservar un árbol histórico y mantener la vista hacia Kirkland Hall desde la entrada al campus, mientras que una torre octogonal en la esquina del comedor se orienta de forma destacada hacia el Alumni Lawn.

El interior de EBI se concibió para ofrecer una secuencia de espacios públicos y privados acogedores y de carácter atemporal. El comedor, revestido en caoba, y el gran salón principal evocan las antiguas bibliotecas que en el pasado promovían la vida académica. El edificio también alberga a varios estudiantes de posgrado, miembros del profesorado, un aula y un estudio de danza. En las plantas superiores se distribuyen salas de estar, espacios de estudio y pequeñas cocinas que proporcionan ámbitos más tranquilos para el trabajo o la convivencia.

um grande degrau na fachada norte protege uma árvore histórica e preserva a vista para o Kirkland Hall a partir da entrada do campus, enquanto uma torre octogonal que sublinha a esquina da sala de jantar, tem uma vista de destaque sobre o Alumni Lawn.

O interior do EBI foi projetado para criar uma série de espaços públicos e privados de convívio intemporais e acolhedores. O refeitório revestido a mogno e a volumosa Grande Sala evocam as veneráveis bibliotecas que fomentavam o conhecimento académico no passado. O edifício também abriga vários estudantes de pós-graduação, professores, uma sala de aula e um estúdio de dança. Salas de estar para estudantes, salas de estudo e pequenas cozinhas estão espalhadas pelos andares superiores como espaços mais tranquilos para estudo ou convívio.



elements (towers, gables, oriels, etc.) were integrated for an idiosyncratic exterior character. The architecture responds to its setting: a large step in the north facade saves a heritage tree and preserves a vista to Kirkland Hall from the campus entry, while an octagonal tower anchoring the corner of

reinterpretarse y dar lugar a un “gótico de Vanderbilt”. En las fachadas se empleó una arenisca local (*Crab Orchard*) con el fin de transmitir una sensación artesanal. Se integraron elementos arquitectónicos como torres, frontones y miradores para dotar al conjunto de un carácter exterior singular. La arquitectura responde a su

ser recombinada para criar um “Gótico Vanderbilt”. Um arenito local (*Crab Orchard*) foi usado nas fachadas para dar uma sensação artesanal. Elementos arquitetónicos (torres, empenas, janelas salientes, etc.) foram integrados para criar um aspeto exterior idiossincrático. A arquitetura responde ao seu ambiente:

< Passage, corridor, great room, and dining hall of E. Bronson Ingram College | Pasaje, corredor, gran salón y comedor de E. Bronson Ingram College | Passagem, corredor, grande sala e refeitório de E. Bronson Ingram College (Steve Hall)

> View of Zeppos College from the southeast | Vista de Zeppos College desde el sureste | Vista de Zeppos College a partir do sudeste (Steve Hall)



Zeppos College

After completing EBI, we were commissioned to design the next three colleges along West End Avenue from the south side of Alumni Lawn to the campus’s southwestern tip. During the master-planning process, the tallest edifice on campus—the power plant chimney—was demolished. The loss of this landmark was noted by many students and faculty, prompting us to envisage including a tower, in part as a new guidepost. A tower would also serve the university’s aim of creating a landmark to orient all of Nashville to the Vanderbilt campus on the city’s growing skyline.

Zeppos College

Tras finalizar EBI recibimos el encargo de diseñar los tres siguientes colegios a lo largo de West End Avenue, desde el extremo sur del Alumni Lawn hasta el límite suroccidental del campus. Durante el proceso de planificación se demolió la chimenea de la central térmica, el edificio más alto del campus. La pérdida de ese hito fue señalada por numerosos estudiantes y profesores, lo que nos llevó a considerar la incorporación de una torre como nuevo punto de referencia. Esta estructura también respondía al propósito de la universidad de crear un elemento emblemático que orientara visualmente a la ciudad de Nashville hacia el campus de Vanderbilt dentro de su horizonte urbano en expansión.

Zeppos College

Após concluir o EBI, fomos contratados para projetar os três colégios seguintes ao longo da West End Avenue, desde o lado sul do Alumni Lawn até a ponta sudoeste do campus. Durante o processo de planeamento geral, o edifício mais alto do campus – a chaminé da central elétrica – foi demolido. A perda deste marco foi notada por muitos estudantes e professores, o que nos levou a considerar a inclusão de uma torre, em parte como um novo ponto de referência. Uma torre também serviria o objetivo da universidade de criar, no horizonte da cidade, um marco para orientar toda a cidade de Nashville rumo ao campus da Vanderbilt.

View of Zeppos College from the southwest | Vista de Zeppos College desde el suroeste | Vista de Zeppos College a partir do sudoeste (Steve Hall)



Functional Ingenuity

Because the campus side of the three new colleges was planned as pedestrian-only, all service to the buildings needed to be from West End Avenue, a highly trafficked thoroughfare. We opted to combine loading and trash access in a single underground dock serving all three buildings and giving direct access to an elevator under the 20-story tower. The ramp is neatly tucked between Zeppos and Rothschild Colleges and disappears into the base of the tower, so it is never seen from the campus side.

Plan

Positive feedback from students at EBI confirmed our inclination to continue using the quadrangle format for Zeppos. The footprint available was smaller than for EBI, so the density of accommodation needed to be greater, which required careful manipulation of the massing to maintain a scale

Lógica funcional

Dado que el lado del campus donde se ubican los tres nuevos colegios se destinó exclusivamente al tránsito peatonal, todos los servicios de los edificios debían resolverse desde West End Avenue, una vía con un tráfico intenso. Optamos por un muelle subterráneo único para la carga y la gestión de residuos que da servicio a los tres edificios y conecta directamente con un ascensor situado bajo la torre de veinte plantas. La rampa de acceso se integra discretamente entre los colegios Zeppos y Rothschild y se oculta en la base de la torre, de modo que resulta invisible desde el interior del campus.

Plan

Las valoraciones positivas de los estudiantes de EBI confirmaron nuestra intención de mantener el esquema de patio cuadrangular en Zeppos. La superficie disponible era menor que en EBI, por lo que fue necesario aumentar la densidad residencial, lo cual exigió un estudio minucioso de los volúmenes

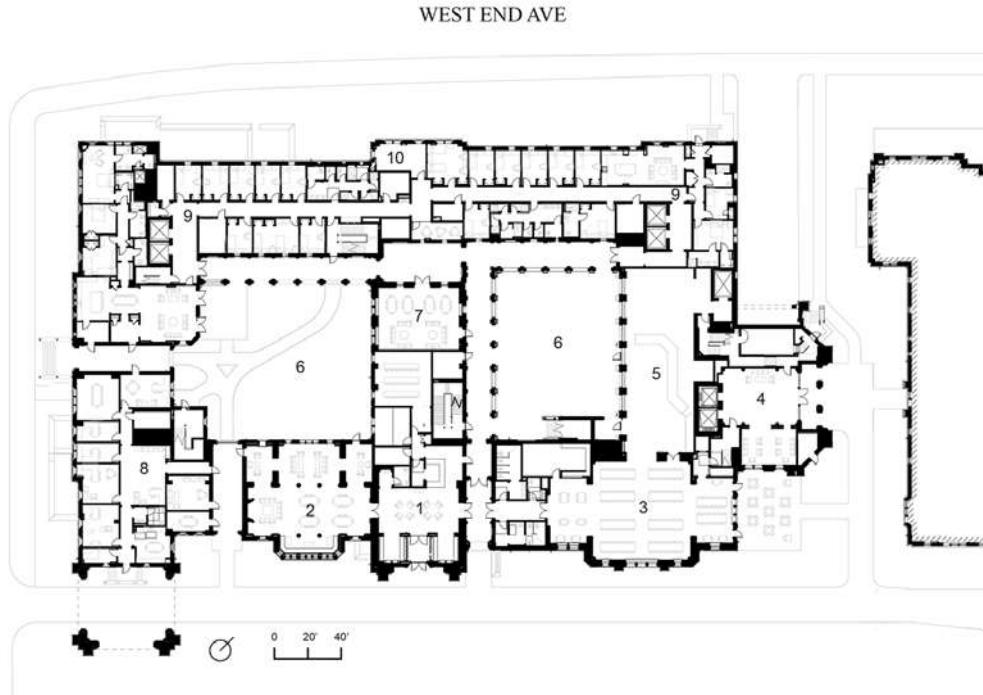
Engenho funcional

Como o lado do campus onde estavam situadas os três novos colégios foi planeado para ser exclusivamente pedonal, todos os serviços aos edifícios tinham de ser prestados a partir da West End Avenue, uma via de tráfego intenso. Optámos por combinar o acesso para carga e descarga e lixo numa única doca subterrânea que serve os três edifícios e dá acesso direto a um elevador sob a torre de 20 andares. A rampa está bem escondida entre os colégios Zeppos e Rothschild e desaparece na base da torre, por isso nunca é vista a partir do campus.

Plano

O feedback positivo dos alunos do EBI confirmou a nossa inclinação para reutilizar o formato de pátio quadrangular para a Zeppos. A área disponível era menor do que a do EBI, por isso as acomodações teriam de ter uma maior densidade, o que exigiu uma manipulação cuidadosa da volumetria

Level 1 plan of Zeppos College. Legend: 1–Main lobby 2–Great room 3–Dining room 4–Tower lobby 5–Kitchen 6–Courtyard 7–Shared living room 8–Offices 9–Sleeping quarters 10–Group music room | Planta del nivel 1 de Zeppos College. Leyenda: 1–Vestíbulo principal 2–Gran salón 3–Comedor 4–Vestíbulo de la torre 5–Cocina 6–Patio 7–Sala común 8–Oficinas 9–Dormitorios 10–Sala de música para grupos | Planta do nível 1 de Zeppos College. Legenda: 1–Átrio principal 2–Grande sala 3–Refeitório 4–Átrio da torre 5–Cozinha 6–Pátio 7–Sala comum 8–Escritórios 9–Dormitórios 10–Sala de música em grupo



inside the courtyards that would feel comfortable to students for gathering and let in ample sunlight in winter. Thus the residential floors along West End Avenue step down toward the campus.

The college’s plan and three-dimensional layout are again configured to continually subdivide the residents into smaller groups, based on research that suggests that more intimate settings support the development of close and lasting relationships. Past the lobby, students walk under open arcades and are separated left and right to their “hall,” dividing the population in half. Circulation encourages students to participate in public-focused courtyard spaces, after which they are invited into the stairway or elevator closest to their room tier.

para conservar una escala adecuada en los patios, capaz de generar espacios de encuentro confortables y permitir una buena entrada de luz solar durante el invierno. Por esta razón los niveles residenciales situados a lo largo de West End Avenue descienden progresivamente hacia el interior del campus.

La planta y la organización volumétrica del colegio se conciben nuevamente para subdividir de manera continua a los residentes en grupos más pequeños, según estudios que indican que los entornos más íntimos favorecen la formación de vínculos personales estrechos y duraderos. Tras atravesar el vestíbulo los estudiantes pasan bajo arcadas abiertas y se dirigen a la izquierda o a la derecha hacia su “hall”, lo que divide a los residentes en dos mitades. El sistema

para manter uma escala dentro dos pátios que fosse confortável para os alunos se reunirem e que permitisse a entrada de luz solar abundante no inverno. Assim, os pisos residenciais ao longo da West End Avenue rebaixam-se em direção ao campus.

O plano e o layout tridimensional do colégio foram novamente configurados para subdividir continuamente os residentes em grupos menores, com base em pesquisas que sugerem que ambientes mais íntimos favorecem o desenvolvimento de relacionamentos próximos e duradouros. Ao atravessar o átrio, os estudantes caminham sob arcadas abertas e são separados à esquerda e à direita rumo ao seu «corredor», dividindo a população ao meio. A circulação incentiva os estudantes a



Courtyard | Patio | Pátio (Steve Hall)

1: Entry pavilion of Zeppos College at the southeast corner 2: Southwest entrance with the smaller corner tower of Zeppos College | 1: Pabellón de acceso de Zeppos College en la esquina sureste 2: Entrada suroeste con la torre menor en esquina de Zeppos College | 1: Pavilhão de entrada de Zeppos College na esquina sudeste 2: Entrada sudoeste com a torre menor de esquina de Zeppos College (Steve Hall)



1



2

de circulación incentiva la participación en los espacios de los patios, concebidos como áreas de convivencia, y desde allí los estudiantes acceden a la escalera o al ascensor más próximo a su planta de habitaciones.

participar em espaços públicos centrados no pátio, após o que são convidados a subir a escada ou entrar no elevador mais próximo do seu andar.

Architecture

Two Collegiate Gothic styles were used for EBI, responding to adjacent historic buildings. Zeppos sits at a corner of the campus with limited context of value—suburban modern hotels and ranch houses—so here there was less to be guided by. It was decided that a departure from Collegiate Gothic would weaken the goal of unifying the campus architecturally from north to south, whereas developing a series of stylistic “cousins” along West End Avenue might create the distinct identity that the Vanderbilt campus lacked.

Arquitectura

En EBI se emplearon dos variantes del estilo *Collegiate Gothic*, en respuesta a los edificios históricos contiguos. Zeppos, en cambio, se sitúa en una esquina del campus con un entorno de escaso valor arquitectónico – compuesto por hoteles modernos de carácter suburbano y viviendas tipo rancho –, por lo que las referencias inmediatas eran limitadas. Se concluyó que apartarse del estilo *Collegiate Gothic* habría debilitado el objetivo de unificar el campus desde el punto de vista arquitectónico de norte a sur, mientras que desarrollar una serie de “parientes estilísticos” a lo largo de West End Avenue podía contribuir a dotar al conjunto universitario de la identidad distintiva que hasta entonces le faltaba.

Arquitetura

Dois estilos *Collegiate Gothic* foram usados para o EBI, em resposta aos edifícios históricos adjacentes. O Zeppos fica numa zona do campus com um contexto de valor limitado – hotéis modernos suburbanos e casas de fazenda –, portanto, havia menos referências a seguir. Decidiu-se que um afastamento do estilo *Collegiate Gothic* enfraqueceria o objetivo de unificar arquitetonicamente o campus de norte a sul, enquanto que o desenvolvimento de uma série de estilos “primos” ao longo da West End Avenue poderia criar a identidade distinta que faltava ao campus da Vanderbilt.

Notable Architectural Elements

In addition to its role as a waymark on campus and a highlight on the Nashville skyline, the 90-meter tall, 20-story tower houses international scholars in 22 apartments on floors six through thirteen, with the top six floors containing a suite of panoramic meeting rooms. The architectural challenge was to configure usable space on each floor while keeping the floorplate small enough for the tower to have elegance. We transitioned the mostly brick shaft to a highly decorated top with numerous limestone patterns, eight types of brick, and *Crab Orchard* sandstone, with a

Elementos arquitectónicos destacados

Además de funcionar como punto de referencia en el campus y como hito visible en el horizonte urbano de Nashville, la torre de 90 metros y veinte plantas alberga a investigadores internacionales en veintidós apartamentos distribuidos entre las plantas sexta y decimotercera, mientras que las seis superiores contienen un conjunto de salas panorámicas para reuniones. El desafío arquitectónico consistió en organizar espacios útiles en cada nivel sin que la planta resultara demasiado amplia, con el fin de preservar la esbeltez de la torre. La transición del cuerpo principal, ejecutado

Elementos arquitetônicos notáveis

Além de ser um marco no campus e um destaque no horizonte de Nashville, a torre de 90 metros de altura e 20 andares abriga acadêmicos internacionais em 22 apartamentos, do sexto ao décimo terceiro andar, com os seis andares superiores a incluir um conjunto de salas de reuniões panorâmicas. O desafio arquitetônico foi configurar o espaço útil em cada andar, mantendo a área dos pisos suficientemente pequena para que a torre tivesse elegância. Transformámos o eixo do edifício, em grande parte de tijolo, numa parte superior altamente decorada com vários padrões de calcário, oito tipos

< Watercoloured elevation rendering and photograph of the decorated top of the main tower | Alzado en acuarela y fotografía de la parte superior de la torre principal decorada | Renderização em aquarela do alçado e fotografia da parte superior decorada da torre principal (2: Steve Hall)
> Study and meeting spaces at Zeppos College | Espacios de estudio y reunión en Zeppos College | Espaços de estudo e reunião em Zeppos College (Steve Hall)



1



2



chamfered rectangular base sculpted into a fully octagonal limestone crown.

The smaller corner tower at Zeppos College marks the southwest entrance to the Vanderbilt campus, building up with *Crab Orchard* stone to a cupola. A pavilion was added at the southeast corner as a gateway to the campus, its lower two levels opening onto a new walkway and its top three floors containing additional beds. Rather than interrupting the dining room, the stair is exterior in the courtyard, creating a memorable feature that differentiates this college from the others.

mayoritariamente en ladrillo, hacia el remate superior se resolvió mediante una rica ornamentación que combina múltiples motivos en piedra caliza, ocho tipos distintos de ladrillo y arenisca *Crab Orchard*, que corona el conjunto con una base rectangular achaflanada que se transforma en una corona octogonal de piedra caliza.

La torre menor situada en la esquina del Zeppos College señala el acceso suroccidental al campus de Vanderbilt y, construida con piedra *Crab Orchard*, se eleva hasta culminar en una cúpula. En la esquina sureste se añadió un pabellón que actúa como puerta de entrada al campus; sus dos niveles inferiores se abren a un nuevo paseo peatonal, mientras que los tres superiores albergan dormitorios adicionales. Para no interrumpir el espacio del comedor, la escalera se dispuso en el patio exterior, lo que configura un elemento distintivo que otorga al edificio una identidad propia dentro del conjunto de colegios.

de tijolo e arenito *Crab Orchard*, com uma base retangular chanfrada esculpida numa coroa de calcário totalmente octogonal.

A torre de canto mais pequena do Zeppos College marca a entrada sudoeste do campus da Vanderbilt, construída com pedra *Crab Orchard* até à cúpula. Um pavilhão foi adicionado no canto sudeste como porta de entrada para o campus, com os dois andares inferiores abrindo para uma novo passeio e os três andares superiores contendo camas adicionais. Em vez de interromper o refeitório, a escada situa-se no pátio exterior, criando um elemento marcante que diferencia este colégio dos demais.



Rothschild College from West End Avenue | Rothschild College desde West End Avenue | Rothschild College visto a partir de West End Avenue (Steve Hall)

Rothschild College

Rothschild College is home to 330 students, several resident advisors, and a resident faculty head. It is organized around three courtyards, one accessible to the public and two for residents only, affording sequestered outdoor space and natural light. A path or promenade runs through the public courtyard and connects Rothschild with Zeppos College to the west and Carmichael College (the core of the historic campus) and EBI College to the east.

Rothschild has a full complement of public interior spaces, including a two-story wood-paneled Great Room, a dining room and servery, an active learning classroom, and a 100-seat studio theater. In addition to student housing, it contains an apartment for the Faculty Advisor including family accommodations.

Rothschild College

Rothschild College alberga a 330 estudiantes, varios asesores residentes y un profesor residente. Su organización gira en torno a tres patios: uno de acceso público y dos reservados a los residentes, que proporcionan espacios exteriores protegidos y una adecuada iluminación natural. Un paseo atraviesa el patio público y enlaza Rothschild con el Zeppos College hacia el oeste y con el Carmichael College (núcleo del campus histórico) y el EBI College hacia el este.

Rothschild dispone de un conjunto completo de espacios interiores comunes, entre ellos un gran salón de dos alturas revestido en madera, un comedor con zona de autoservicio, un aula para el aprendizaje activo y un teatro-estudio con un aforo de cien personas. Además de las residencias estudiantiles el edificio incluye un apartamento para el profesor asesor con espacio de alojamiento para su familia.

Rothschild College

O Rothschild College alberga 330 estudantes, vários conselheiros residentes e um chefe residente do corpo docente. Está organizado em torno de três pátios, um acessível ao público e dois apenas para residentes, proporcionando um espaço exterior isolado e luz natural. Um caminho ou passeio atravessa o pátio público e liga o Rothschild ao Zeppos College a oeste e ao Carmichael College (o núcleo do campus histórico) e ao EBI College a leste.

O Rothschild dispõe de uma variedade de espaços interiores públicos, incluindo uma Grande Sala de dois andares com painéis de madeira, uma sala de jantar e copa, uma sala de aula de aprendizagem ativa e um teatro estúdio com capacidade para 100 lugares. Além do alojamento para estudantes, inclui um apartamento para o Orientador Educacional, incluindo acomodações familiares.

Promenade and Queens Gate

Given the way the promenade interacts with Rothschild’s primary points of entry, we looked to English gateway precedents such as the Tudor Great Gatehouse at Hampton Court for inspiration. The promenade begins at the adjacent Zeppos College and passes through the base of the four-story Rothschild Gate and into the public courtyard, with the dining suite to the south and the Great Room to the north. Given its prominent location and abundant detail, the gateway marks a distinct identity.

Great Room

The double-height Great Room features oak flooring, mahogany wainscoting, a coffered ceiling, and lofty windows on two sides that flood it with natural light. The space is punctuated at both ends

Paseo y puerta de Queens

Por la manera en que el paseo se articula con los principales accesos del Rothschild College, tomamos como referencia portadas inglesas históricas, como la Gran Puerta Tudor de Hampton Court. El recorrido comienza en el vecino Zeppos College, atraviesa la base de la puerta Rothschild – de cuatro plantas – y desemboca en el patio público, con el comedor al sur y el gran salón al norte. Por su posición destacada y la riqueza de sus detalles esta puerta confiere al conjunto una identidad singular.

Gran salón

El gran salón, de doble altura, presenta suelos de roble, zócalos de caoba, un techo artesonado y amplios ventanales en dos de sus fachadas que inundan el espacio de luz natural. En sus extremos

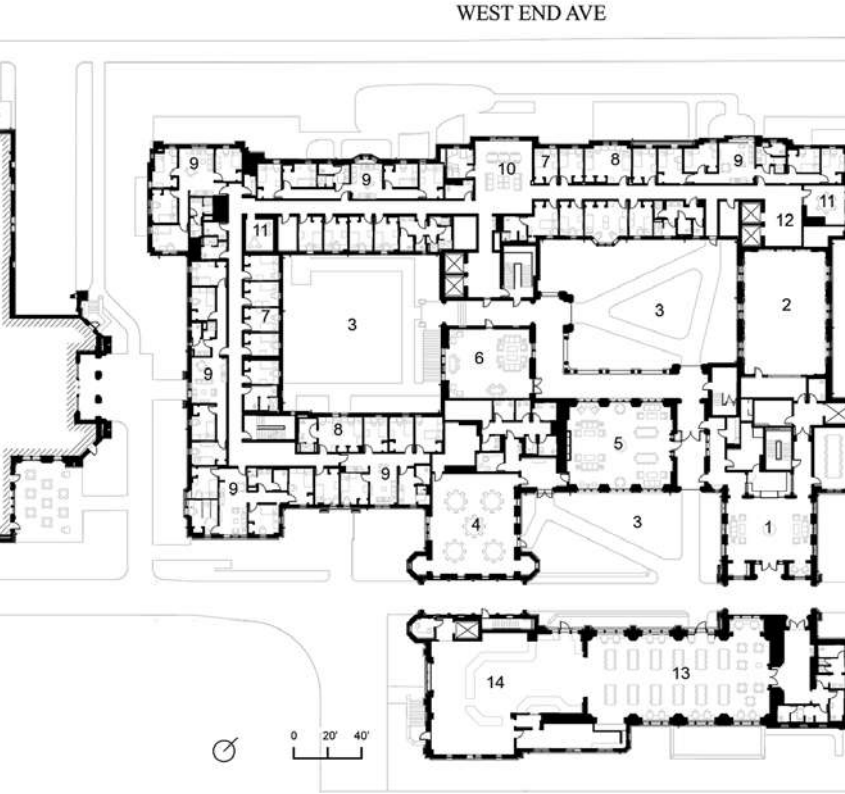
Passeio e Queens Gate

Dada a forma como o passeio interage com os principais pontos de entrada do Rothschild, procurámos inspiração em precedentes de portaria Ingleses, como a Grande Portaria Tudor em Hampton Court. O passeio começa no Zeppos College adjacente e atravessa a base do Portão Rothschild, de quatro andares, entrando no pátio público, com o conjunto de salas de jantar a sul e a Grande Sala a norte. Dada a sua localização proeminente e a riqueza de detalhes, a portaria possui uma identidade distinta.

Grande sala

A Grande Sala de dois andares tem pavimento de carvalho, lambris de mogno, um teto de caixotões e janelas altas em dois dos lados que a inundam de luz natural. O espaço é pontuado

Ground floor plan of Rothschild College. Legend: 1–RC lobby 2–Black box theater 3–Courtyard 4–Active learning room 5–Great hall 6–Shared living room 7–Single room 8–Double room 9–Bed suite 10–Lounge 11–Study room 12–Elevator lobby 13–Dining room 14–Servery | Planta baja de Rothschild College. Leyenda: 1–Vestíbulo RC 2–Sala de teatro “black box” 3–Patio 4–Aula de aprendizaje activo 5–Gran salón 6–Sala común 7–Habitación individual 8–Habitación doble 9–Suite 10–Sala de estar 11–Sala de estudio 12–Vestíbulo de ascensores 13–Comedor 14–Office de servicio | Planta térrea de Rothschild College. Legenda: 1–Átrio RC 2–Teatro “black box” 3–Pátio 4–Sala de aprendizagem ativa 5–Grande sala 6–Sala comum 7–Quarto individual 8–Quarto duplo 9–Suíte 10–Sala de estar 11–Sala de estudo 12–Átrio dos elevadores 13–Refeitório 14–Copa de serviço





1, 2: Facade details facing West End Avenue 3: Entrance to the public courtyard from the east 4: Rothschild Gate toward Zeppos College | 1, 2: Detalles de la fachada hacia West End Avenue 3: Acceso al patio público desde el este 4: Puerta Rothschild hacia Zeppos College | 1, 2: Detalhes da fachada voltada para West End Avenue 3: Acesso ao pátio público desde o leste 4: Portão Rothschild em direção a Zeppos College (Steve Hall)



5, 6: Public courtyard of Rothschild College 7-9: Passage details along the public walkway through the courtyard | 5, 6: Patio público de Rothschild College 7-9: Detalles de los pasajes a lo largo del recorrido público por el patio | 5, 6: Pátio público de Rothschild College 7-9: Detalhes das passagens ao longo do percurso público através do pátio (Steve Hall)

by two-story pointed arches and has second-story overlooks.

se abren arcos apuntados de dos niveles, y una galería en la planta superior permite contemplar el espacio desde lo alto.

em ambas as extremidades por arcos quebrados de dois andares e tem varandas no segundo piso.

Dining Room and Servery

Comedor y zona de autoservicio

Sala de jantar e copa

Similar to the Great Room, the Dining Room is a double-height space occupying the full width of a wing, with high arched windows on either side. The floor has deep red porcelain tiles laid in a diamond pattern with contrasting gray and white bands. The walls feature high mahogany wainscoting topped with a warm beige plaster frieze, and the

Al igual que el gran salón, el comedor es un espacio de doble altura que ocupa todo el ancho de una de las alas, con altos ventanales arqueados en ambos lados. El pavimento está formado por baldosas de porcelana rojo oscuro dispuestas en patrón de rombos, con bandas grises y blancas que producen contraste. Las paredes presentan un zócalo alto de caoba

À semelhança da Grande Sala, a Sala de Jantar é um espaço de pé-direito duplo que ocupa toda a largura de uma ala, com janelas altas em arco em ambos os lados. O chão tem ladrilhos de porcelana em vermelho escuro dispostos em padrão de losango, com faixas de cinzento e branco a contrastar. As paredes apresentam lambris altos de mogno, encimados por



1



2



3



4

1: Inner courtyard with arcade 2: Servery 3–4: Great room | 1: Pátio interior con arquería 2: Office de servicio 3–4: Gran salón | 1: Pátio interno com arcada 2: Copa de serviço 3–4: Grande sala (Steve Hall)

coffered ceiling grid of wood battens disguises suspended acoustic tiles to attenuate mealtime noise.

rematado por un friso de estuco beige cálido, mientras que el techo artesonado, compuesto por listones de madera, oculta paneles acústicos suspendidos que reducen el ruido durante las comidas.

um friso de gesso de um bege quente, e a grelha do teto de caixotões, de ripas de madeira, disfarça as placas acústicas suspensas destinadas a atenuar o ruído das refeições.

Studio Theater

The studio theater is designed to host extracurricular student-led dramatic productions. We leveraged the site's grade change to fit the nearly three-story venue into the lower level. Amenities include retractable seating and a walkable mesh technical grid.

Teatro-estudio

El teatro-estudio está concebido para acoger representaciones teatrales extracurriculares organizadas por los propios estudiantes. Se aprovechó el desnivel del terreno para encajar en la planta inferior un espacio de casi tres alturas. El equipamiento incluye gradas retráctiles y una estructura técnica de malla transitable.

Teatro-estúdio

O teatro estúdio foi concebido para acolher produções dramáticas extracurriculares organizadas pelos estudantes. Aproveitámos a diferença de nível do terreno para integrar este espaço de quase três andares no piso inferior. As instalações incluem assentos retráteis e uma grelha técnica por onde se pode caminhar.

Active Learning Classroom

This is another unique aspect of the Rothschild College program. Different from traditional lecture or

Aula para el aprendizaje activo

Este espacio constituye otro de los aspectos singulares del programa del Rothschild College. A diferencia de

Sala de aprendizagem ativa

Este é outro aspeto único do programa do Rothschild College. Diferente das tradicionais salas de aula ou

even seminar rooms, active learning environments are intended to foster more collaborative learning between student peers. Accordingly, the space is outfitted with movable tables, chairs, and marker boards to allow for a variety of configurations.

las aulas tradicionales o incluso de las salas de seminarios, los entornos de aprendizaje activo están concebidos para favorecer la colaboración entre los propios estudiantes. Por ello, el aula cuenta con mesas, sillas y paneles móviles que permiten organizar distintas configuraciones según las necesidades de cada actividad.

até de seminários, os ambientes de aprendizagem ativa destinam-se a promover uma aprendizagem mais colaborativa entre os estudantes. Desta forma, o espaço está equipado com mesas, cadeiras e quadros brancos para escrita móveis para permitir uma variedade de configurações.

Materiality and Art

Although the four colleges share the Collegiate Gothic aesthetic, we varied the material palette and ornamental detailing from one to another to give each a distinct character within a coherent, identifiable precinct. Each one employs Indiana limestone trim and a subtly different reddish brick blend for its primary exterior palette, with further variations contributing to the desired contrast between colleges. Rothschild also features public art with a full complement of exterior carved stone panels.

Materialidad y arte

Aunque los cuatro colegios comparten la estética del estilo Collegiate Gothic, se introdujeron variaciones en la elección de materiales y en los detalles ornamentales para otorgar a cada edificio un carácter propio dentro de un conjunto coherente y reconocible. Todos utilizan molduras de piedra caliza de Indiana y una mezcla de ladrillos rojizos con matices diferentes como base de la composición exterior, a lo que se añaden otras variaciones que refuerzan el contraste buscado entre los colegios. Rothschild incorpora además obras de arte público y un conjunto completo de paneles exteriores tallados en piedra.

Materialidade e arte

Embora os quatro colégios partilhem a estética do estilo Collegiate Gothic, diversificamos a paleta de materiais e os pormenores ornamentais em cada caso, de modo a conferir a cada um um caráter distinto dentro de uma área coerente e identificável. Em cada um utilizam-se acabamentos em calcário Indiana e uma combinação de tijolo avermelhado ligeiramente diferente para a sua paleta exterior principal, com variações adicionais que contribuem para o contraste desejado entre os colégios. O Rothschild também exhibe arte pública com uma ampla variedade de painéis de pedra esculpida no exterior.

Reconciling Modern Construction Realities with the Desired Aesthetic

The project's scope, scale, and quality expectations called for a building that would stand the test of time, so many tried and tested materials and techniques were used both inside and out. The exterior palette includes brick and carved limestone masonry, steel sash windows, and clay-tile roofing. Yet the traditional appearance had to be reconciled with modern cavity walls for moisture protection, thermal comfort, and energy efficiency, along with other modern realities.

Conciliar las exigencias de la construcción moderna con la estética deseada

Por su alcance, escala y nivel de calidad, el proyecto requería un edificio capaz de resistir el paso del tiempo. Por ello se emplearon tanto en el interior como en el exterior materiales y técnicas ampliamente contrastados. La selección exterior incluye fábricas de ladrillo y piedra caliza tallada, carpinterías metálicas y cubiertas de teja cerámica. Sin embargo, la apariencia tradicional debía conciliarse con los sistemas constructivos contemporáneos de muros de doble hoja con cámara de aire, necesarios para garantizar la protección frente a la humedad, el confort térmico y la eficiencia energética, junto con otras exigencias propias de la edificación actual.

Reconciliação das realidades da construção moderna com a estética desejada

O âmbito, a escala e as expectativas de qualidade do projeto exigiram um edifício que resistisse à passagem do tempo, pelo que foram utilizados muitos materiais e técnicas testados e comprovados, tanto no interior como no exterior. A paleta exterior inclui alvenaria de tijolo e calcário esculpido, janelas de guilhotina de aço e telhas de barro. No entanto, o aspeto tradicional teve de ser conciliado com paredes duplas modernas para proteção contra a humidade, conforto térmico e eficiência energética, juntamente com outras realidades modernas.

Carmichael College

The 305-student Carmichael College is the latest of the four DMSAS-designed residential colleges. As such, it needed to support the image established with the preceding Zeppos and Rothschild Colleges to the west, relate to the established campus fabric to the south and east, and make a referential connection with EBI College across Alumni Lawn.

At the exterior, the east entry tower bay marks the end of the college promenade linking Zeppos, Rothschild, and Carmichael. This college has two courtyards, one public and the other residents-only. Between the courtyards

Carmichael College

El Carmichael College, con capacidad para 305 estudiantes, es el más reciente de los cuatro colegios mayores diseñados por DMSAS. Por ello debía mantener la imagen establecida por los colegios Zeppos y Rothschild al oeste, integrarse con el tejido consolidado del campus al sur y al este, y estar conectado con el EBI College al otro lado del Alumni Lawn.

En el exterior, la torre del acceso oriental señala el final del paseo que conecta los colegios Zeppos, Rothschild y Carmichael. Este colegio cuenta con dos patios, uno público y otro reservado a los residentes. Entre ambos, y con ventanas orientadas a los dos espacios, se sitúa el

Carmichael College

O Carmichael College, com 305 estudantes, é o mais recente dos quatro colégios residenciais projetados pela DMSAS. Como tal, precisava de integrar-se com a imagem estabelecida pelos Zeppos e Rothschild Colleges, a oeste, estabelecer uma relação com a estrutura existente do campus a sul e leste, e fazer uma ligação referencial com o EBI College do outro lado do Alumni Lawn.

No exterior, a baía da torre de entrada leste marca o fim do passeio do colégio que liga o Zeppos, Rothschild e Carmichael. Este colégio possui dois pátios, um público e outro apenas para residentes. Entre os pátios e com janelas

Carmichael College from West End Avenue | Carmichael College desde West End Avenue | Carmichael College visto a partir de West End Avenue (Steve Hall)



Passages and entrances along the promenade | Pasajes y accesos a lo largo del paseo | Passagens e acessos ao longo do passeio (Steve Hall)

and with windows opening onto both, the dining room is unusually finished in brick. Carmichael is the terminus of the promenade, through the public courtyard accessed via arched portals, as well as of a whole distinctive residential precinct.

Addressing Context and Being Good Neighbors

While the adjoining DMSAS-designed Zeppos, Rothschild, and Carmichael Colleges form a unified sequence with shared uses, each needed to respond to unique surroundings.

These colleges are relatively large, tall buildings, typically of four or five stories. The five identical West End Row Cottages, by contrast, are each only 12 meters square and one story and a half tall. They have brick bearing walls and complex intersecting hip and jerkinhead roofs with wood trim and expressive chimneys, all indicative of their late Victorian vintage. They are highly regarded by the university and

comedor, terminado de manera poco habitual en ladrillo visto. Carmichael constituye el punto final del recorrido, que atraviesa el patio público mediante pórticos abovedados, y también el cierre de un conjunto residencial con identidad propia.

Responder al contexto y ser buenos vecinos

Aunque los colegios Zeppos, Rothschild y Carmichael, diseñados por DMSAS, forman una secuencia unificada con usos comunes, cada uno debía responder a las particularidades de su entorno inmediato.

Estos colegios son edificios de considerable tamaño y altura, normalmente de cuatro o cinco plantas. En cambio, las cinco West End Row Cottages, idénticas entre sí, miden solo doce metros de lado y una planta y media de altura. Presentan muros portantes de ladrillo, cubiertas a cuatro aguas con faldones entrecruzados y limas mixtas, carpinterías de madera y chimeneas expresivas, todos ellos rasgos característicos de su origen

que se abrem para ambos, a sala de jantar tem um acabamento invulgar em tijolo. O Carmichael é o término do passeio, através do pátio público acedido por portais em arco, bem como de todo um distinto complexo residencial.

Abordagem ao contexto e a ser bons vizinhos

Embora os Zeppos, Rothschild e Carmichael Colleges, projetados pela DMSAS, formem uma sequência unificada com instalações partilhadas, cada um teve de responder a envolventes únicas.

Estes colégios são edifícios relativamente grandes e altos, tipicamente com quatro ou cinco andares. Os cinco chalés idênticos da West End Row, por outro lado, têm apenas 12 metros quadrados e um andar e meio de altura cada. Têm paredes portantes de tijolo e telhados complexos que combinam telhados de quatro águas com telhados com empena truncada, com remates de madeira e

figure prominently in the campus fabric, so Carmichael College, a mere 9 meters distant, had to be deferential in their regard. Thus we stepped its massing down on the east side and added complexity with appropriately scaled projecting bays and a varied roof line.

To the south, the relatively small structure housing the neighboring Fraternal House also needed to be respected. Accordingly, the college footprint is held back to provide a comfortable breathing space between house and college. A happy byproduct of this is the relatively wide-open vista Carmichael has from the south, making this facade highly visible, while the rest of it is largely hemmed in. The massing, roof line, fenestration, and deployment of masonry details give this side of the college particular interest.

victoriano tardío. La universidad las valora especialmente y ocupan un lugar destacado dentro del tejido del campus, por lo que el Carmichael College, situado a apenas nueve metros de distancia, debía mantener una actitud respetuosa hacia ellas. Por esta razón, el volumen del edificio se redujo progresivamente en su lado oriental y la complejidad fue mayor al incorporar cuerpos salientes bien proporcionados y una cubierta de líneas variadas.

Hacia el sur el edificio relativamente pequeño que alberga la Fraternal House vecina también requería un trato respetuoso. Por ello, la planta del colegio se retranqueó para dejar un espacio intermedio que garantizara una distancia cómoda entre ambos edificios. Como resultado afortunado el Carmichael dispone de una vista relativamente abierta

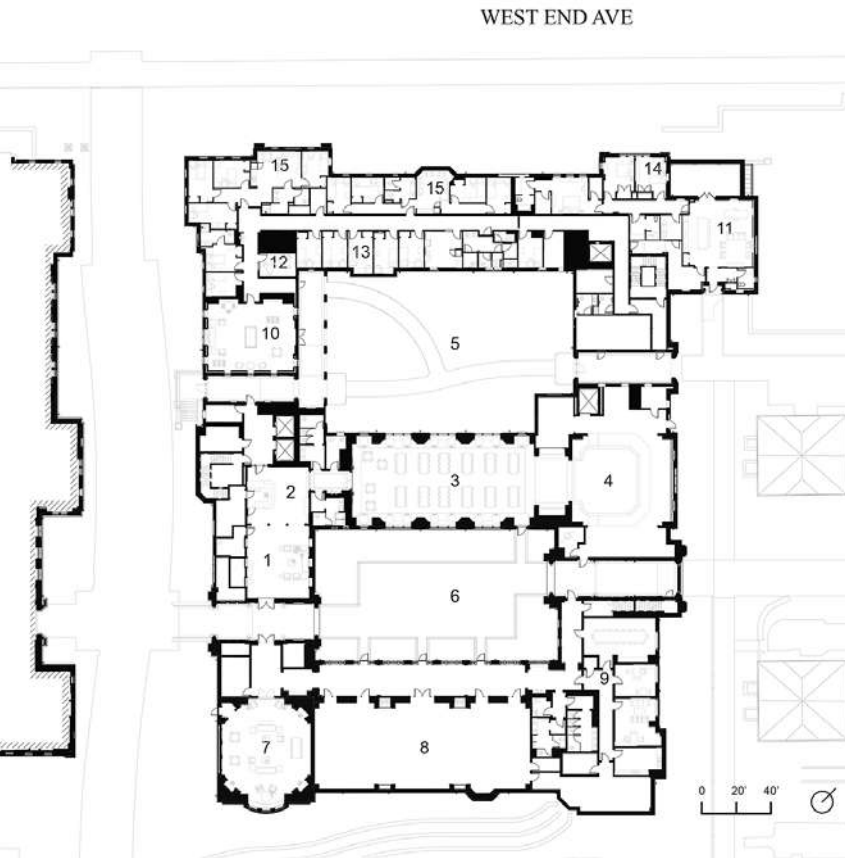
chaminés expressivas, tudo indicativo da sua época vitoriana tardia. São muito valorizados pela universidade e ocupam um lugar de destaque na estrutura do campus, por isso o Carmichael College, a apenas 9 metros de distância, teve de ser respeitoso para com eles. Assim, reduzimos o seu volume no lado leste e adicionámos complexidade através baías salientes de escala apropriada e uma linha de telhado variada.

Para o sul, a estrutura relativamente pequena que alberga a vizinha Fraternal House também precisou de ser respeitada. Consequentemente, a planta baixa do colégio foi recuada para proporcionar um espaço confortável entre a casa e o colégio. Um feliz resultado disso é a vista relativamente desafogada que o Carmichael tem a partir do sul, tornando esta fachada muito visível, enquanto o

North courtyard for residents only | Patio norte de uso exclusivo para residentes | Pátio norte de uso exclusivo para residentes (Steve Hall)



Ground floor plan of Carmichael College. Legend: 1-Lobby 2-Security 3-Dining hall 4-Servery 5-North courtyard 6-South courtyard 7-Great room 8-Multipurpose room 9-Offices 10-Shared living room 11-Living/dining/kitchen 12-Study 13-Single room 14-Double room 15-Four-bed suite | Planta baja de Carmichael College. Leyenda: 1-Vestíbulo 2-Control de seguridad 3-Comedor 4-Office de servicio 5-Patio norte 6-Patio sur 7-Gran salón 8-Sala polivalente 9-Oficinas 10-Sala común 11-Salón/comedor/cocina 12-Sala de estudio 13-Habitación individual 14-Habitación doble 15-Suite de cuatro camas | Planta térrea de Carmichael College. Legenda: 1-Átrio 2-Segurança 3-Refeitório 4-Copa de serviço 5-Pátio norte 6-Pátio sul 7-Grande sala 8-Sala polivalente 9-Escritórios 10-Sala comum 11-Sala/jantar/cozinha 12-Sala de estudo 13-Quarto individual 14-Quarto duplo 15-Suite de quatro camas



desde el sur, lo que convierte esta fachada en la más visible del conjunto, mientras que el resto del edificio permanece en gran parte encajado entre construcciones. La composición volumétrica, la línea de cubierta, la disposición de los huecos y el tratamiento de la fábrica de ladrillo otorgan a este frente un interés arquitectónico particular.

resto é em grande parte confinado. A volumetria, a linha do telhado, o arranjo das janelas e dos detalhes de alvenaria dão a este lado do colégio um interesse particular.



Dining room and servery | Comedor y office de servicio | Refeitório e copa de serviço (Steve Hall)

Dining Room & Servery

In the interior, the Carmichael dining room is one of a kind. Its walls are clad in smooth ironspot brick laid in polychromatic decorative patterns complemented with limestone details including window mullions, horizontal bands, keystones, and brackets supporting large stained-wood ceiling trusses. A network of wooden coffer beams and battens completes a sloped cathedral ceiling between the trusses. The room has custom ornamental light fixtures, including large circular chandeliers and single and double wall sconces.

Great Room

This biaxially symmetrical room has rounded clipped corners with arched

Comedor y zona de autoservicio

En el interior, el comedor del Carmichael es un espacio verdaderamente singular. Sus paredes están revestidas con ladrillos lisos de tipo *ironspot*, dispuestos en motivos decorativos policromos y complementados con elementos de piedra caliza: maineles, bandas horizontales, claves y ménsulas que sostienen las grandes cerchas de madera teñida del techo. Un entramado de vigas artesonadas y listones de madera completa la cubierta inclinada de carácter catedralicio situada entre las cerchas. El espacio se ilumina mediante luminarias ornamentales diseñadas a medida, entre ellas grandes lámparas suspendidas circulares y apliques murales simples y dobles.

Gran salón

Este espacio, de planta simétrica en dos ejes, presenta esquinas redondeadas

Sala de jantar e copa

No interior, a sala de jantar do Carmichael é única. As suas paredes estão revestidas com tijolo *ironspot* liso disposto em padrões decorativos policromáticos, complementados com detalhes em calcário, incluindo maineis, faixas horizontais, chaves de arco e mísulas que suportam grandes tesouras de madeira tingida. Uma rede de caixotões de madeira e ripas conclui um teto inclinado de catedral entre as tesouras. A sala dispõe de iluminação ornamental personalizada, incluindo grandes lustres circulares e arandelas de parede simples e duplas.

Grande sala

Esta sala com simetria biaxial tem cantos arredondados com alcovas



Great room | Gran salón | Grande sala (Steve Hall)

alcoves and built-in study desks. The corners culminate in a simple shallow dome ceiling. The walls are clad with a tall wood wainscot, with slender arch-top windows on two sides. The shallow dome is fashioned from acoustic plaster and has subtle stepping accentuated by paint shades over a circular double-tier custom chandelier. Stained and natural hickory flooring is laid in an octagonal pattern coordinated with the room's circular geometry.

y recortadas que albergan nichos abovedados con escritorios de estudio empotrados. Las esquinas culminan en un techo en forma de cúpula poco profundo de gran sencillez. Las paredes están revestidas con un zócalo alto de madera, y en dos de sus lados se abren esbeltas ventanas rematadas en arco. La cúpula, enlucida con un yeso con propiedades fonoabsorbentes, presenta una leve gradación de niveles realizada por matices de color y por una lámpara circular de dos coronas diseñada a medida. El pavimento combina madera teñida y natural de nogal americano (*hickory*), dispuesta en un patrón octogonal que se coordina con la geometría circular del espacio.

em arco e secretárias embutidas. Os cantos culminam num teto em cúpula simples e pouco profundo. As paredes estão revestidas com um lambril alto de madeira, com janelas arqueadas delgadas em dois dos lados. A cúpula rasa é feita de gesso acústico e tem uma gradação subtil, acentuada pelos tons de tinta sobre um candelabro circular personalizado de dois níveis. O piso de nogueira tingida e natural está disposto num padrão octogonal, em harmonia com a geometria circular da sala.

Multi-Purpose Room

This room is unique to Carmichael, and is available for use by the broader university community for seminars, banquets, etc. It is a large subdividable space reached by a long naturally lit gallery antechamber opening onto the public courtyard. The room has natural wood wainscoting and trim, a coffered ceiling, and movable partitions that fold neatly away into storage pockets.

Thus, with these four collegiate edifices, the Vanderbilt campus has been renewed, and new life given to traditional university architecture.

Sala polivalente

Esta sala, exclusiva del Carmichael, está disponible para toda la comunidad universitaria y se utiliza para seminarios, banquetes y otros eventos. Se trata de un amplio espacio divisible, al que se accede a través de una galería longitudinal iluminada de forma natural que se abre al patio público. La sala presenta zócalos y molduras de madera natural, un techo artesonado y tabiques móviles que se repliegan ordenadamente en nichos de almacenamiento.

Con estos cuatro edificios universitarios, el campus de Vanderbilt se ha renovado y la arquitectura académica tradicional ha adquirido una nueva vitalidad.

Sala multi-usos

Esta sala é exclusiva do Carmichael e está disponível para utilização por toda a comunidade universitária para seminários, banquetes, etc. É um grande espaço subdivisível, acessível através de uma longa galeria-antecâmara com luz natural que dá para o pátio público. A sala tem lambris e acabamentos de madeira natural, um teto de caixotões e paredes divisórias móveis que se dobram e arrumam em compartimentos próprios.

Assim, com estes quatro edifícios colegiais, o campus da Vanderbilt foi renovado e foi dada uma nova vida à arquitetura universitária tradicional.

Biographies | Biografías | Biografias

Gregory Hoss

Gregory is a Principal and Managing Director at David M. Schwarz Architects, where he has overseen the design of E. Bronson Ingram and Zeppos Colleges. He has been with the firm since 1997 and has been a registered architect since 1994. A graduate of The Catholic University of America, he now serves on the School of Architecture's Board of Visitors and as an Adjunct Professor. Gregory is a member of the American Institute of Architects and the Royal Institute of British Architects. He has been Principal-in-Charge for many of the firm's high-profile projects, including Dickies Arena, The Smith Center for the Performing Arts, Sundance Square, Cook Children's Medical Center, the American Airlines Center, and the Vanderbilt University residential colleges. His expertise in designing academic and campus facilities has made him a trusted leader in creating innovative and contextually sensitive environments for institutions of higher learning.

Gregory es socio y director general en el estudio David M. Schwarz Architects, donde ha supervisado el diseño de E. Bronson Ingram y Zeppos Colleges. Graduado por la Catholic University of America, actualmente forma parte del consejo asesor de su Escuela de Arquitectura y ejerce como profesor adjunto. Gregory es miembro del American Institute of Architects (AIA) y del Royal Institute of British Architects (RIBA). Ha sido arquitecto principal (*Principal-in-Charge*) en numerosos proyectos de relevancia del estudio, entre ellos Dickies Arena, The Smith Center for the Performing Arts, Sundance Square, Cook Children's Medical Center, American Airlines Center y los colegios mayores de la Universidad de Vanderbilt. Su experiencia en el diseño de espacios académicos y universitarios lo ha consolidado como un referente en la creación de entornos innovadores y sensibles a su contexto para instituciones de educación superior.

Gregory é sócio e diretor-geral na David M. Schwarz Architects, onde supervisionou o projeto dos Colleges E. Bronson Ingram e Zeppos. Está na empresa desde 1997 e é arquiteto registado desde 1994. Formou-se na The Catholic University of America, onde agora faz parte do Conselho Consultivo da Escola de Arquitetura e é Professor Adjunto. Gregory é membro do American Institute of Architects e do Royal Institute of British Architects. Foi Coordenador Principal de muitos dos projeto de grande visibilidade da empresa, incluindo a Dickies Arena, o The Smith Center for the Performing Arts, a Sundance Square, o Cook Children's Medical Center, o American Airlines Center e os colégios residenciais da Vanderbilt University. A sua experiência na conceção de instalações académicas e de campus fez dele um líder de confiança na criação de ambientes inovadores e contextualmente sensíveis para instituições de ensino superior.

Steve Knight

Steve is a Principal and Managing Director at David M. Schwarz Architects, where he has overseen the design of Rothschild and Carmichael Colleges. He joined the firm in 1997 after receiving his Master of Architecture from North Carolina State University. He has served as Principal-in-Charge (PIC) on many signature projects in the firm's higher education, arts, and commercial portfolios. As PIC, Steve recently completed design development on a new residence hall at Florida A&M University and oversaw the completion of two residential colleges at Vanderbilt University with a gross area of some 190,000 m2. He was also Project Manager on a feasibility study for a new School of Music at Longwood University. In addition to his education portfolio, Steve has served as PIC on many of the firm's recent arts and entertainment projects and just completed the first two phases of Chevy Chase Lake, a 530-unit mixed-use district in Chevy Chase, Maryland.

Steve es socio y director general en el estudio David M. Schwarz Architects, donde ha supervisado el diseño de Rothschild y Carmichael Colleges. Se incorporó al estudio en 1997, tras obtener el título de Máster en Arquitectura por la North Carolina State University. Ha sido arquitecto principal (*Principal-in-Charge*, PIC) en numerosos proyectos emblemáticos del estudio en los ámbitos de la educación superior, las artes y la arquitectura comercial. Como PIC, Steve finalizó recientemente el desarrollo del diseño de una nueva residencia universitaria en la Florida A&M University y supervisó la ejecución de los dos colegios mayores en la Universidad de Vanderbilt, con una superficie total de unos 190.000 m². También ejerció como jefe de proyecto en el estudio de viabilidad para una nueva Escuela de Música en la Longwood University. Además de su trabajo en el ámbito educativo Steve ha sido PIC en varios de los proyectos más recientes del estudio y acaba de completar las dos primeras fases de Chevy Chase Lake, un distrito de uso mixto con 530 unidades residenciales en Chevy Chase, Maryland.

Steve é sócio e diretor-geral na David M. Schwarz Architects, onde supervisionou o projeto dos Colleges Rothschild e Carmichael. Juntou-se à empresa em 1997 depois de ter recebido o seu Mestrado em Arquitetura pela Universidade Estadual da Carolina do Norte. Atuou como Coordenador Principal em muitos projetos de referência no portefólio da empresa nas áreas de ensino superior, artes e comércio. Como Coordenador Principal, Steve concluiu recentemente o desenvolvimento do projeto de um novo dormitório na Florida A&M University e supervisionou a conclusão dos dois colégios residenciais na Vanderbilt University, com uma área bruta de cerca de 190.000 m². Foi também Gestor de Projeto num estudo de viabilidade para uma nova Escola de Música na Longwood University. Além do seu portefólio de educação, Steve serviu como Coordenador Principal em muitos dos projetos recentes de artes e entretenimento da empresa e acaba de concluir as duas primeiras fases de Chevy Chase Lake, um bairro de uso misto com 530 unidades em Chevy Chase, Maryland.

David M. Schwarz Architects

David M. Schwarz Architects (DMSAS) is a Washington, D.C.-based multi-specialty architecture firm with a portfolio that includes higher education, mixed-use, sports and entertainment, performing arts, and master-planning commissions. Its team believes in designing places for people through careful attention to scale, materials, and detail, remaining responsive to the needs of the client, the inherent nature of the site, and appropriate architectural themes. DMSAS is a collaboration between Founder and Design Director David Schwarz, five Managing Directors (two of whom, Gregory Hoss and Steve Knight, contributed to this article in their capacities as Project Managers on the Vanderbilt residential colleges), a team of Associates, and design staff.

David M. Schwarz Architects (DMSAS) es un estudio de arquitectura con sede en Washington D.C., especializado en proyectos de diversa índole que abarcan centros de educación superior, desarrollos de uso mixto, instalaciones deportivas y de entretenimiento, artes escénicas y planes directores. Su equipo concibe la arquitectura como el arte de crear lugares para las personas, mediante una atención cuidadosa a la escala, los materiales y el detalle. El trabajo del estudio se caracteriza por dar una respuesta sensible a las necesidades del cliente, a las condiciones del lugar y a los temas arquitectónicos apropiados. DMSAS está formado por su fundador y director de diseño, David Schwarz, cinco directores generales – dos de los cuales, Gregory Hoss y Steve Knight, han contribuido a este artículo como jefes de proyecto de los colegios mayores de la Universidad de Vanderbilt –, además de un equipo de asociados y personal de diseño.

David M. Schwarz Architects (DMSAS) é um gabinete de arquitetura multi-especializado, com sede em Washington, D.C., cujo portefólio inclui projetos de ensino superior, uso misto, desporto e entretenimento, artes performativas e comissões para a elaboração de planos diretores. A sua equipa acredita na conceção de espaços para as pessoas, através de uma atenção cuidadosa à escala, aos materiais e aos detalhes, mantendo-se atenta às necessidades do cliente, à natureza inerente do local e aos temas arquitetónicos apropriados. A DMSAS resulta da colaboração entre o Fundador e Diretor de Design David Schwarz, cinco Administradores (dos quais, Gregory Hoss e Steve Knight, contribuíram para este artigo no seu papel de Gestores de Projeto nos colégios residenciais da Vanderbilt), uma equipa de Associados e a equipa de design.



The Red Pepper House in Lamu: An Exploration of the Limits of Makuti

La Casa de la Pimienta Roja en Lamu: Una exploración de los límites del makuti

A Casa da Pimenta Vermelha em Lamu: Uma exploração dos limites do makuti

Urko Sánchez

Introduction

The Red Pepper House is a project that takes the possibilities of *makuti*—traditional thatched roofing of palm leaves—to the limit, while proposing a reflection on the boundaries between architecture and nature. Where does a house end and where does its setting begin? This is a dwelling conceived as an inhabited wood, in which interior and exterior spaces merge to the point of catering for a lifestyle fully integrated into the natural environment.

Introducción

La Casa de la Pimienta Roja es un proyecto que lleva al extremo las posibilidades del *makuti*, como es conocida la tradicional cubierta de hojas de palma, y que plantea una reflexión sobre los límites entre arquitectura y naturaleza. ¿Dónde empieza la casa y dónde termina el entorno? Se trata de una vivienda concebida como un bosque habitado, en la que los espacios interiores y exteriores se funden hasta ofrecer una forma de vida plenamente integrada en el entorno natural.

Introdução

A Casa da Pimenta Vermelha é um projeto que leva ao extremo as possibilidades do *makuti*, como é conhecida a cobertura tradicional de folhas de palmeira, e que propõe uma reflexão sobre os limites entre arquitetura e natureza. Onde começa a casa e onde termina o ambiente? Trata-se de uma habitação concebida como uma floresta habitada, na qual os espaços interiores e exteriores se fundem para oferecer um modo de vida plenamente integrado no ambiente natural.

< Semi-open central gathering space | Espacio central semiabierto de reunión | Espaço central semiabierto de convívio (Fernando Torres)

> Aerial photo of the complex | Foto aérea del conjunto | Fotografia aérea do conjunto (Alberto Heras)



The project encompassed both the design and the building of the house, enabling a thorough exploration of traditional materials along with their limits and possibilities. The client wished for an abode in Lamu, Kenya away from the bustle of the town and yet in touch with its community. His interest in architecture and nature gave us the opportunity to draw up an organic proposal combining traditional techniques with contemporary requirements.

Preserving the woods, using local materials, and spatial flexibility were all key design considerations. The house was to be built on a single floor for reasons of accessibility and to include versatile areas adaptable to various levels

El proyecto abarcó tanto el diseño como la construcción de la vivienda, lo que permitió una exploración a fondo de los materiales tradicionales, sus límites y sus posibilidades. El cliente deseaba una residencia en Lamu, alejada del bullicio del pueblo pero vinculada a su comunidad. Su interés por la arquitectura y la naturaleza ofreció la oportunidad de desarrollar una propuesta orgánica, capaz de combinar técnicas tradicionales con las exigencias contemporáneas.

La conservación del bosque, el uso de materiales autóctonos y la flexibilidad espacial constituyeron elementos clave en el desarrollo del diseño. La vivienda debía resolverse en una sola planta por razones de accesibilidad e incluir áreas versátiles que pudieran adaptarse a distintos

O projeto abrangeu tanto o design como a construção da habitação, o que permitiu uma exploração aprofundada dos materiais tradicionais, dos seus limites e das suas possibilidades. O cliente desejava uma residência em Lamu, afastada da agitação da cidade, mas ligada à sua comunidade. O seu interesse pela arquitectura e pela natureza ofereceu a oportunidade de desenvolver uma proposta orgânica, capaz de combinar técnicas tradicionais com as exigências contemporâneas.

A conservação da floresta, o uso de materiais autóctones e a flexibilidade espacial foram elementos-chave no desenvolvimento do projeto. A habitação deveria ser construída num único piso por razões de acessibilidade e incluir



Location plan | Plano de situación | Planta de localização



Aerial photos of the complex | Fotos aéreas del conjunto | Fotografias aéreas do conjunto (Alberto Heras)

of occupation. These requirements gave rise to a reinterpretation of Swahili architecture, adapted to particular needs but intact in its essence.

The project was conducted by Urko Sánchez Architects in 2007–2009, with the collaboration of Iñaki Alonso and Fernando Navadijos. It has a built area of 1,500 m².

Location

Situated at the northernmost point of Lamu, the house is surrounded by dense woodland of acacias, and borders the beach on its southeast side. Luxuriant vegetation, birdsong, and the sea breeze make up a setting conducive to architecture in close contact with nature.

niveles de ocupación. Estas condiciones impulsaron una reinterpretación de la arquitectura suajili, adaptada a necesidades concretas sin perder su esencia.

El proyecto fue realizado por Urko Sánchez Architects entre 2007 y 2009. Contó con la colaboración de Iñaki Alonso y Fernando Navadijos. La superficie construida es de 1.500 m².

Ubicación

Situada en el extremo norte de Lamu, la casa se encuentra rodeada por un denso bosque de acacias y limita con la playa en su ladera sureste. La espesura de la vegetación, el canto de las aves y la brisa marina ofrecían un entorno propicio para una arquitectura en estrecho contacto con la naturaleza.

áreas versáteis que pudessem adaptar-se a diferentes níveis de ocupação. Estas condições impulsionaram uma reinterpretação da arquitectura suaili, adaptada a necessidades concretas e sem perder a sua essência.

O projeto foi realizado por Urko Sánchez Architects entre 2007 e 2009. Contou com a colaboração de Iñaki Alonso e Fernando Navadijos. A área construída é de 1.500 m².

Localização

Localizada no extremo norte de Lamu, a casa está rodeada por uma densa floresta de acácias e faz fronteira com a praia na sua encosta sudeste. A vegetação densa, o canto dos pássaros e a brisa marinha proporcionavam um ambiente propício para uma arquitectura em estreito contacto com a natureza.

Inhabiting the Shade

In the warm climate of Lamu, shading and cross ventilation are essential to assuring habitability. The design caters for an open-air lifestyle, with a *makuti* roof allowing the occupants to enjoy the setting without suffering from the region’s scorching sun or torrential rain. This roof, inspired by local traditional architecture, is interlaced with the treetops, rising to the same height and representing a continuity between building and landscape.

The house’s floor, continuous and raised 50–100 cm above the sand, covers the whole area under the roof and extends to include exterior spaces such as terraces, swimming pools, and meeting places. Executed with lime, the flooring offers a cool surface inviting one to walk barefoot and enhancing the connection with the setting, blurring the boundary between interior and exterior.

Habitar la sombra

En el clima cálido de Lamu, la sombra y la ventilación cruzada son condiciones esenciales para garantizar la habitabilidad. La propuesta parte de un estilo de vida al aire libre, donde una cubierta de *makuti* permite disfrutar del entorno sin sufrir los efectos del sol abrasador ni de las lluvias torrenciales. Esta cubierta, inspirada en la arquitectura tradicional del lugar, se entrelaza con las copas de los árboles, alzándose a su misma altura y reforzando la continuidad entre la construcción y el paisaje.

El pavimento de la casa, continuo y elevado entre 50 cm y un metro sobre la arena, cubre toda la huella de la cubierta y se prolonga para acoger espacios exteriores como terrazas, piscinas y áreas de encuentro. Ejecutado con cal, este pavimento ofrece una superficie fresca que invita a caminar descalzo y refuerza la conexión con el entorno, al disolver el límite entre interior y exterior.

Habitar a sombra

No clima quente de Lamu, sombra e ventilação cruzada são condições essenciais para garantir a habitabilidade. A proposta parte de um estilo de vida ao ar livre, onde uma cobertura de *makuti* permite desfrutar do ambiente sem sofrer os efeitos do sol escaldante ou das chuvas torrenciais. Esta cobertura, inspirada na arquitetura tradicional do local, entrelaça-se com as copas das árvores, elevando-se à mesma altura e reforçando a continuidade entre a construção e a paisagem.

O pavimento da casa, contínuo e elevado entre 50 cm e um metro acima da areia, cobre toda a área da cobertura e prolonga-se para abrigar espaços exteriores como terraços, piscinas e áreas de encontro. Executado com cal, este pavimento oferece uma superfície fresca que convida a andar descalço e reforça a conexão com o ambiente, ao dissolver a fronteira entre o interior e o exterior.

In Clearings in the Woods

The design of the house set out from the principle of preserving all of the existing vegetation, so there was no need to fell a single tree. It was set out in natural woodland clearings, in line with the positions of the tall trees, which define both the open and enclosed spaces and the areas of sun and shade. The house’s footprint coincides with the shade cast by its roof, allowing delimiting walls to be dispensed with.

Ocupar los claros del bosque

El diseño de la casa se basó en la conservación íntegra de la vegetación preexistente, de modo que no fue necesario talar un solo árbol. La implantación se realizó aprovechando los claros naturales del bosque, respetando la ubicación de los árboles de gran porte, que definen tanto los espacios abiertos y cerrados como las zonas de sol y sombra. La huella de la construcción coincide con la proyección de sombra de la cubierta, lo que permite prescindir de muros que delimiten la casa.

Ocupar as clareiras da floresta

O design da casa baseou-se na conservação integral da vegetação pré-existente, de modo que não foi necessário cortar uma única árvore. A implantação foi feita aproveitando as clareiras naturais da floresta, respeitando a localização das árvores de grande porte, que definem tanto os espaços abertos e fechados quanto as zonas de sol e sombra. A implantação da construção coincide com a projeção da sombra do telhado, o que permite dispensar paredes que delimitem a casa.

The House’s Geometry

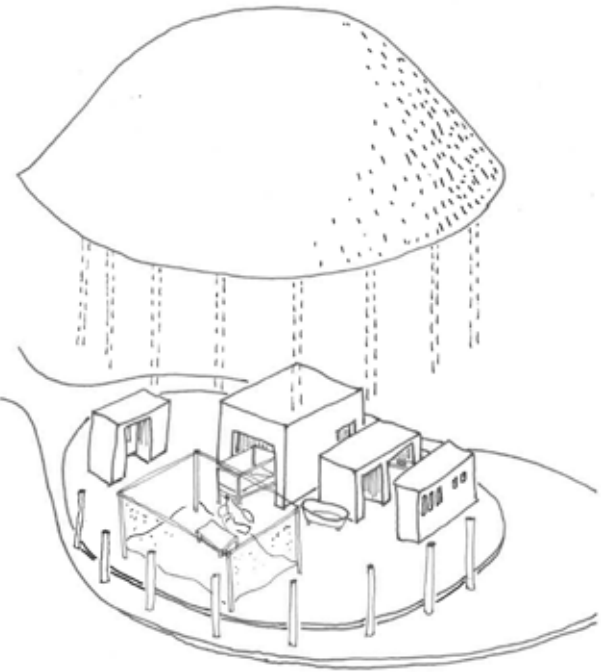
The geometry of the house is defined by the clearance between the trees and the 45° roof pitch required to shed rainwater efficiently. Thus, where the clearing is narrower, the elevation is higher, and where the former is wider, the latter is lower. As all the spaces are

La geometría de la casa

La geometría de la casa se define por la relación entre la distancia libre entre los árboles y la pendiente de 45° necesaria para garantizar un drenaje eficiente de la lluvia. Así, cuanto más estrecho es el claro, menor es la altura; cuanto más ancho, mayor es la elevación. Como

A geometria da casa

A geometria da casa é definida pela relação entre a distância livre entre as árvores e a inclinação de 45° necessária para garantir uma drenagem eficiente da chuva. Assim, quanto mais estreita é a clareira, menor é a altura; quanto mais larga, maior é a elevação. Como todos os espaços estão



< Axonometric view of the structure of a room
| Vista axonométrica de la estructura de una habitación
| Vista axonométrica da estrutura de uma sala
> Aerial image of the site layout occupying the clearings in the forest
| Imagen aérea del replanteo ocupando los claros del bosque
| Imagem aérea da implantação ocupando as clareiras da floresta





Ground floor plan | Planta baja | Planta do rés-do-chão

connected so as to encourage fluid, cool circulation between the various rooms, the outcome is a continuous, organic volume. Its outline makes one think of a strange recumbent creature or, as we imagined while designing it, the snake that swallowed an elephant in *The Little Prince*.

Architectural Language

The various degrees of privacy are articulated through a gradual transition between interior and exterior. The layout of the bedrooms and bathrooms, the only wholly enclosed spaces, is inspired by the little coral-stone structures scattered about the beaches of Lamu. These volumes, covered by mangrove-beam ceilings, contribute to the Swahili identity of the ensemble.

todos los espacios están conectados para favorecer una circulación fluida y fresca entre las distintas estancias, el resultado es un volumen continuo y orgánico. Su silueta recuerda a la forma de un extraño animal recostado o, como solíamos imaginar durante el proceso de diseño, a la serpiente que se había tragado al elefante en *El Principito*.

Lenguaje arquitectónico

Los distintos grados de privacidad se articulan a través de una transición gradual entre el interior y el exterior. La disposición de los dormitorios y los baños, los únicos espacios completamente cerrados, se inspira en las pequeñas construcciones de piedra de coral que salpican la playa de Lamu. Estos volúmenes, cubiertos con forjados de vigas de manglar, refuerzan la identidad suajili del conjunto.

conectados para favorecer uma circulação fluida e fresca entre as diferentes divisões, o resultado é um volume contínuo e orgânico. A sua silhueta lembra a forma de um animal estranho deitado ou, como costumávamos imaginar durante o processo de design, a cobra que engoliu o elefante em *O Pequeno Príncipe*.

Linguagem arquitectónica

Os diferentes graus de privacidade são articulados através de uma transição gradual entre o interior e o exterior. A disposição dos quartos e casas de banho, os únicos espaços completamente fechados, é inspirada nas pequenas construções de pedra de coral que pontilham a praia de Lamu. Esses volumes, cobertos com vigas de mangue, reforçam a identidade suaíli do conjunto.

Makuti wooden structure during construction | Estructura de madera de makuti durante la construcción | Estrutura de madeira de makuti durante a construção



Production of Swahili decorative moldings | Elaboración de molduras decorativas suajilis | Fabrico de molduras decorativas suaílis

Coral stone, formed of fossilized corals, is a soft, versatile material, essential to the coastal architecture of East Africa. In Lamu it is extracted manually from the Manda Maweni quarry by Luo workers originally from around Lake Victoria, using traditional techniques

La piedra de coral, formada por corales fosilizados, es un material blando y versátil, fundamental en la arquitectura costera de África Oriental. En Lamu, se extrae manualmente de la cantera de Manda Maweni por trabajadores Luo, originarios del lago Victoria,

A pedra de coral, formada por corais fosilizados, é um material macio e versátil, fundamental na arquitectura costeira da África Oriental. Em Lamu, é extraída manualmente da pedreira de Manda Maweni por trabalhadores Luo, originários do Lago Vitória,

handed down over generations. Mangrove wood, for its part, used in Swahili architecture for building floors and ceilings, limits spans to a maximum of just under four meters. Historically exported, today it is used only locally. Sustainable harvesting, along with community conservation and restoration programs, protects the mangrove ecosystem and ensures that the resource is available for future generations.

Another key component of the building is lime plaster, applied by local craftspeople with traditional techniques. A plaster finish provides durability while allowing the walls to breathe through an exchange of humidity with the air, helping reduce the temperature of the breeze as it comes into contact with them.

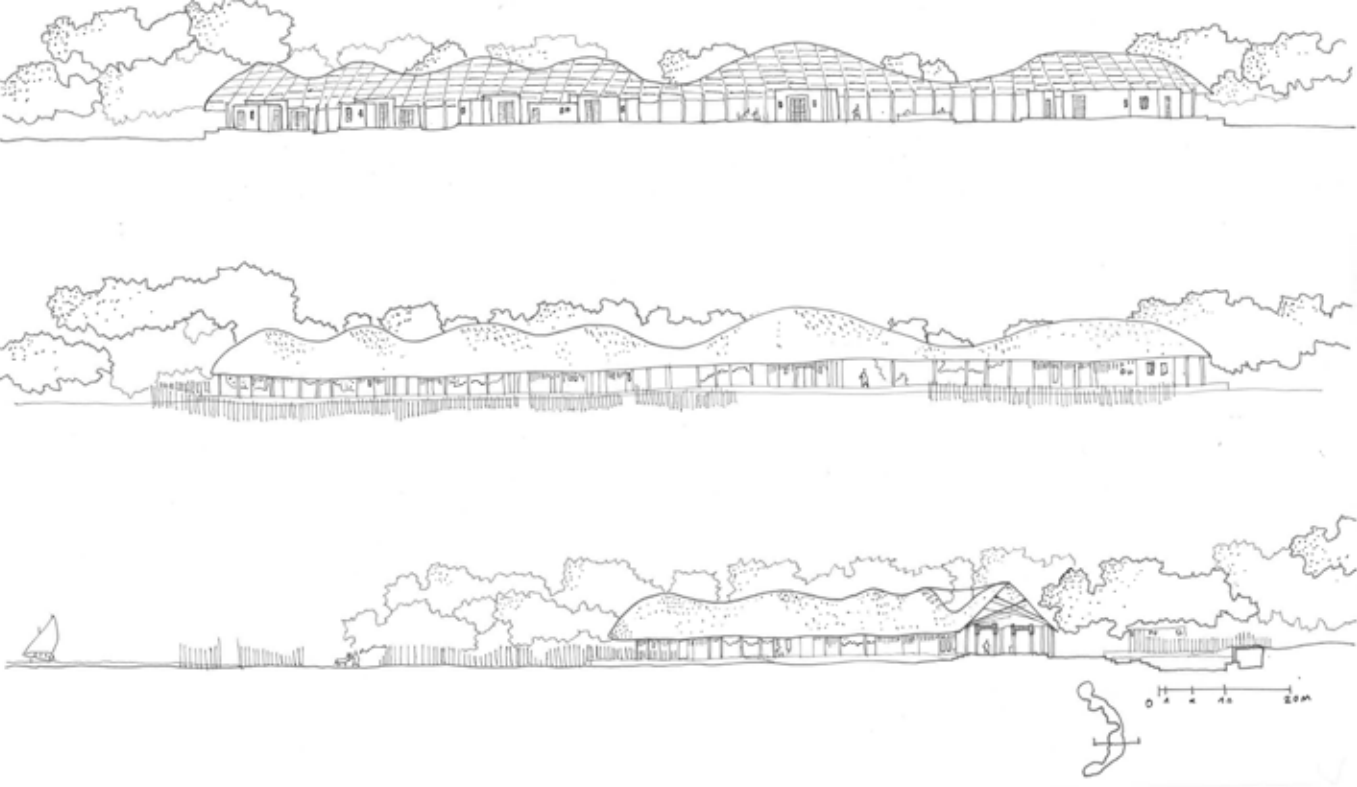
que emplean técnicas tradicionales transmitidas durante generaciones. Por su parte, los mangles, empleados en la arquitectura suajili para la construcción de forjados, limitan la luz máxima de los espacios a algo menos de cuatro metros. Históricamente objeto de exportación, su uso actual se restringe al ámbito local. La recolección sostenible, junto con los programas comunitarios de conservación y restauración, protege este ecosistema y asegura la disponibilidad de recursos para las generaciones futuras.

Otro elemento clave en la construcción es el estuco de cal, aplicado por artesanos locales mediante técnicas tradicionales. Este acabado no solo garantiza su durabilidad, sino que permite que los muros transpiren. El intercambio de humedad de los muros con el aire contribuye a reducir la temperatura de la brisa al entrar en contacto con ellos.

que empregam técnicas tradicionais transmitidas ao longo de gerações. Por sua vez, os mangues, utilizados na arquitetura suaíli para a construção de vigas, limitam a luz máxima dos espaços a pouco menos de quatro metros. Historicamente objeto de exportação, o seu uso atual restringe-se ao âmbito local. A colheita sustentável, juntamente com programas comunitários de conservação e restauração, protege este ecossistema e garante a disponibilidade de recursos para as gerações futuras.

Outro elemento fundamental na construção é o estuque de cal, aplicado por artesãos locais através de técnicas tradicionais. Este acabamento não só garante a sua durabilidade, como também permite que as paredes respirem. A troca de humidade com o ar contribui para reduzir a temperatura da brisa ao entrar em contacto com elas.

Sections and elevations | Secciones y alzados | Cortes e alçados



1, 2: Lime extraction 3: Collection of palm leaves 4: Collection of mangrove wood 5, 6: Collection of sand for construction | 1,2: Extracción de cal 3: recogida de hojas de palma, 4: recogida de manglar 5, 6: recogida de arena para construcción | 1,2: Extração de cal 3: recolha de folhas de palmeira 4: recolha de mangue 5, 6: recolha de areia para construção



and a secondary one of mangrove beams. The *makuti*, consisting of palm leaves arranged over rods and secured with coconut-fiber twine, is a system of thatch “tiles” that offers good heat insulation and effective protection from rain.

The key to the efficacy of such roofing lies in the density and thickness of its materials. The more compact and overlaid the thatch, the greater its durability and insulating capacity. A well-built roof can last an average of ten years without needing maintenance, and two or three more before requiring replacement.

primaria de madera de casuarina y una secundaria de vigas de manglar. El *makuti*, compuesto por hojas de palma dispuestas sobre una varilla y fijadas con cuerda de fibra de cocotero, forma un sistema de tejas vegetales que garantiza un buen aislamiento térmico y una eficaz protección frente a la lluvia.

La clave del buen funcionamiento de esta cubierta reside en la densidad y el espesor del material. Cuanto más compacta y superpuesta es la disposición de las hojas, mayor es su durabilidad y su capacidad de aislamiento. Una cubierta bien ejecutada puede durar, en promedio, unos diez años sin requerir mantenimiento, y entre dos y tres años más antes de necesitar ser reemplazada.

madeira de casuarina e uma secundária de vigas de mangue. O *makuti*, composto por folhas de palmeira dispostas sobre uma haste e fixadas com corda de fibra de coco, forma um sistema de telhas vegetais que garante um bom isolamento térmico e uma proteção eficaz contra a chuva.

A chave para o bom funcionamento deste telhado reside na densidade e espessura do material. Quanto mais compacta e sobreposta for a disposição das folhas, maior será a sua durabilidade e capacidade de isolamento. Um telhado bem executado pode durar, em média, cerca de dez anos sem necessitar de manutenção, e entre dois a três anos mais antes de precisar de ser substituído.

Assembly of *makuti* roofing piece | Montaje de pieza de *makuti* | Montagem de peça de *makuti*



1: Swahili decorative work on traditional niches 2: Swahili decorative work on moldings 3: Tools, including spoons, used for decorative work | 1: Trabajos decorativos suajilis en nichos tradicionales 2: Trabajos decorativos suajilis en molduras 3: Herramientas, incluyendo cucharas, para los trabajos decorativos | 1: Trabalhos decorativos suailis em nichos tradicionais 2: Trabalhos decorativos suailis em molduras 3: Ferramentas, incluindo colheres, usadas nos trabalhos decorativos

The *Makuti* Roof

The house’s layout was defined directly on the ground, respecting the existing woodland clearings. The resulting geometry gave rise to a *makuti* roof with spans of up to 18 meters, sustained by a primary structure of casuarina timber

La cubierta de *makuti*

El trazado de la casa se definió directamente sobre el terreno, respetando los claros existentes en el bosque. La geometría resultante dio lugar a una cubierta de *makuti* con luces de hasta 18 metros, sostenida por una estructura

A cobertura de *makuti*

O traçado da casa foi definido diretamente no terreno, respeitando as clareiras existentes na floresta. A geometria resultante deu origem a uma cobertura de *makuti* com vãos de até 18 metros, sustentada por uma estrutura primária de



1



2



3

1: Makuti roofing piece 2, 3: Basketry work in Matondoni for transporting sand or making mats | 1: Peça de makuti 2, 3: Trabalho de cesteria em Matondoni para transporte de areia ou para elaborar alfombras | 1: Peça de makuti 2, 3: Trabalho de cesteria em Matondoni para transporte de areia ou fabrico de tapetes

In Swahili architecture, a *makuti* is normally used as the main roof of dwellings or as a light freestanding structure. In this project, its use was extended to cover all the various scattered apartments, which are thereby unified under a single roof giving shelter from sun and rain while also being conducive to open-air living in direct connection with the natural environment.

Further to the *makuti*, we included a cross-ventilation system in the spaces enclosed by stone walls with the aim of letting in as much of the sea breeze as possible and keeping the interiors cool without the use of artificial air conditioning. We also avoided the use of glass and other such materials alien to this context, thereby ensuring coherence with traditional architecture and enhancing the sensation of living in the woods.

En la arquitectura suajili, el *makuti* se utiliza habitualmente como cubierta principal de las viviendas o como estructura ligera independiente. En este proyecto, su uso se amplió para cubrir estancias dispuestas de manera dispersa. Las estancias quedaron así unificadas bajo un mismo techo que protege del sol y de la lluvia, al tiempo que favorece una vida al aire libre y en conexión directa con el entorno natural.

Además del *makuti*, se incorporó un sistema de ventilación cruzada en los espacios cerrados por muros de piedra, con el objetivo de maximizar la entrada de la brisa marina y mantener los interiores frescos sin recurrir a sistemas de climatización artificial. Se evitó el uso de vidrio y otros materiales ajenos al contexto, lo que refuerza la coherencia con la arquitectura tradicional y acentúa la experiencia de una vida inmersa en el bosque.

Na arquitectura suaíli, o *makuti* é habitualmente utilizado como cobertura principal das habitações ou como estrutura leve independente. Neste projeto, a sua utilização foi alargada para cobrir as divisões, dispostas de forma dispersa, ficando unificadas sob um mesmo telhado que protege do sol e da chuva, ao mesmo tempo que favorece uma vida ao ar livre e em ligação direta com o ambiente natural.

Além do *makuti*, foi incorporado um sistema de ventilação cruzada nos espaços fechados por paredes de pedra, com o objetivo de maximizar a entrada da brisa marinha e manter os interiores frescos sem recorrer a sistemas de climatização artificial. Evitou-se o uso de vidro e outros materiais estranhos ao contexto, o que reforça a coerência com a arquitetura tradicional e acentua a experiência de uma vida imersa na floresta.

The Weavers of Matondoni

The village of Matondoni is known for its craft tradition in the manufacture of plant-fiber fabrics and structures. The community takes part in the making of ropes, fishing nets, mats and other items, including the baskets used for carrying building materials, essential on a worksite.

Makuti pieces are also made by hand in Matondoni. These were traditionally woven using the middle part of palm leaves, a technique that is aesthetically attractive but less rainproof. Over time this method gave way to the use of leaves tied to 60 cm rods, which have better durability and functionality.

Los tejedores de Matondoni

El pueblo de Matondoni es conocido por su tradición artesanal en la producción de tejidos y estructuras vegetales. La comunidad participa en la fabricación de cuerdas, redes de pesca, esteras y otros elementos, entre ellos los cestos utilizados para el transporte de materiales de construcción, fundamentales en la obra.

Las piezas de *makuti* también se elaboran artesanalmente en Matondoni. Tradicionalmente, se trenzaban empleando la parte central de la hoja de palma, una técnica estéticamente atractiva pero menos resistente a la lluvia. Con el tiempo esta técnica evolucionó hacia el uso de hojas atadas sobre varillas de 60 cm, lo que mejora su durabilidad y su funcionalidad.

Os tecelões de Matondoni

A aldeia de Matondoni é conhecida pela sua tradição artesanal na produção de tecidos e estruturas vegetais. A comunidade participa na fabricação de cordas, redes de pesca, esteiras e outros elementos, entre eles os cestos utilizados para o transporte de materiais de construção, fundamentais na obra.

As peças de *makuti* também são feitas artesanalmente em Matondoni. Tradicionalmente, eram trançadas utilizando a parte central da folha de palmeira, uma técnica esteticamente atraente, mas menos resistente à chuva. Com o tempo, esta técnica evoluiu para a utilização de folhas amarradas em varas de 60 cm, o que melhora a sua durabilidade e funcionalidade.



Elevated platform and bedroom terrace | Plataforma elevada y terraza de dormitorio | Plataforma elevada e terraço do quarto (Stevie Mann)



< Access to the house from the beach/jetty | Acceso a la casa desde la playa/embarcadero | Acesso à casa desde a praia/cais (Stevie Mann)

> 1: Semi-open central gathering space 2: Traditional Swahili bed in the central space | 1: Espacio central semiabierto de reunión 2: Cama suajili tradicional en espacio central | 1: Espaço central semiabierto de convívio 2: Cama suaíli tradicional no espaço central (Fernando Torres)

Conclusion

The Red Pepper House is a model of sustainable architecture integrating tradition and innovation. Its bioclimatic design allows external resource use to be minimized: it is supplied with hot water and electricity by solar power, and water is distributed by gravity from a tower with no need for pressure pumps.

The house was built with profound environmental sensibility. This involved preserving the existing trees and using local labor and materials, such as timber, sand, palm leaves, coral stone, and lime. The materials were transported in dhows and on the backs of donkeys, avoiding the use of machinery, what reduced the environmental impact. As a result, the project’s carbon footprint was minimal.

More than a dwelling, this house is a celebration of the landscape—an invitation to live in harmony with the environment, craft, and the ancestral know-how of Lamu, sensitively reinterpreted so as to rise to the challenges of modern life. The result

Conclusión

La Casa de la Pimienta Roja constituye un modelo de arquitectura sostenible que integra tradición e innovación. Su diseño bioclimático permitió minimizar el uso de recursos externos: la energía solar abastece a la casa de agua caliente y de electricidad, mientras que una torre de agua utiliza la gravedad para distribuir el suministro sin recurrir a bombas de presión.

La construcción se realizó con un profundo respeto por el entorno. Por ello se conservaron los árboles existentes y se utilizó mano de obra local y materiales autóctonos como madera, arena, hojas de palma, piedra de coral y cal. El transporte de materiales se efectuó en dhows de vela y con burros, evitando el uso de maquinaria, lo que redujo el impacto ambiental. Como resultado, la huella de carbono del proyecto es mínima.

Más que una vivienda, esta obra constituye una celebración del paisaje: una invitación a vivir en armonía con el entorno, la artesanía y el saber ancestral de Lamu, reinterpretados con

Conclusão

A Casa da Pimenta Vermelha é um modelo de arquitetura sustentável que integra tradição, inovação e respeito pelo meio ambiente. O seu design bioclimático permitiu minimizar o uso de recursos externos: a energia solar fornece água quente e eletricidade à casa, enquanto uma torre de água utiliza a gravidade para distribuir o abastecimento sem recorrer a bombas de pressão.

A construção foi realizada com profundo respeito pelo meio ambiente. Por isso, as árvores existentes foram preservadas e foi utilizada mão de obra local e materiais autóctones, como madeira, areia, folhas de palmeira, pedra de coral e cal. O transporte de materiais foi feito em dhows à vela e com burros, evitando o uso de maquinaria, o que reduziu o impacto ambiental. Como resultado, a pegada de carbono do projeto é mínima.

Mais do que uma habitação, esta obra constitui uma celebração da paisagem: um convite a viver em harmonia com o ambiente, o artesanato e o saber ancestral de Lamu, reinterpretados com





1



2



3



4



< 1: Bedroom terrace 2: Semi-outdoor bathroom of the main bedroom 3: Desk in the bedroom 4: Indoor bathroom | 1: Terraza de dormitorio 2: Baño semi exterior de dormitorio principal 3: Escritorio en dormitorio 4: Baño interior | 1: Terraço do quarto 2: Casa de banho semi exterior do quarto principal 3: Secretária no quarto 4: Casa de banho interior (Fernando Torres)
> Swahili details in lighting, niches, and washbasin | Detalles suajilis en iluminación, nichos y lavabo | Detalhes suaílis na iluminação, nos nichos e no lavatório (Stevie Mann)

is an architecture with great technical and aesthetic coherence, configured unequivocally for the present day.

sensibilidad para responder a los desafíos del mundo contemporáneo. El resultado es una arquitectura de gran coherencia técnica y estética, con una configuración inequívocamente actual.

sensibilidade para responder aos desafios do mundo contemporâneo. O resultado é uma arquitetura de grande coerência técnica e estética, com uma configuração inequívocamente atual.

Biography | Biografía | Biografia

Urko Sánchez

Con oficinas en Kenia y España, Urko Sanchez Architects acumula más de veinte años de experiencia en África Oriental y Oriente Medio. Su equipo multicultural combina talento local e internacional bajo la dirección de Urko Sanchez, cuya visión innovadora se apoya en una trayectoria global. El estudio desarrolla proyectos residenciales y comerciales con un enfoque sensible al contexto, y emplean materiales autóctonos y técnicas tradicionales. Su arquitectura respeta el paisaje y reinterpreta la tradición vernácula para generar espacios en equilibrio con el entorno. Más que construir, el estudio busca revitalizar saberes sostenibles y sistemas pasivos de climatización, proponiendo una arquitectura contemporánea que preserva la identidad cultural y que proyecta este conocimiento constructivo hacia el futuro.

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Com estúdios no Quênia e em Espanha, a Urko Sanchez Architects acumula mais de vinte anos de experiência na África Oriental e no Médio Oriente. A sua equipa multicultural combina o talento local e internacional sob a direção de Urko Sanchez, cuja visão inovadora se baseia numa trajetória global. O estúdio desenvolve projetos residenciais e comerciais com uma abordagem sensível ao contexto, utilizando materiais autóctones e técnicas tradicionais. A sua arquitetura respeita a paisagem e reinterpreta a tradição vernácula para criar espaços em equilíbrio com o ambiente. Mais do que construir, o estúdio procura revitalizar conhecimentos sustentáveis e sistemas passivos de climatização, propondo uma arquitetura contemporânea que preserva a identidade cultural e projeta este conhecimento construtivo para o futuro.

*The Haus am Burggarten in
Bonn: At the Top of the Stairs, the
Stars*

Uwe Schröder,
Fabian Peters

*Haus am Burggarten en Bonn:
Al final de la escalera, las estrellas*

*A Haus am Burggarten em Bona:
No topo da escadaria, as estrelas*

This article on the work of Uwe Schröder was originally written in German by Fabian Peters and published in Baumeister magazine.

This little residential building designed by architect and architecture professor Uwe Schröder on a vacant plot in the Poppelsdorf district of Bonn houses just six student flats. Despite the confined space, he has been able to vividly demonstrate his theory of architecture while creating spaces that can only be described as beautiful.

Este artículo sobre la obra de Uwe Schröder lo escribió originalmente en alemán Fabian Peters y se publicó en la revista Baumeister.

Este pequeño edificio residencial, proyectado por el arquitecto y catedrático de arquitectura Uwe Schröder en un solar vacío en el barrio de Poppelsdorf de Bonn, alberga tan solo seis apartamentos para estudiantes. A pesar de lo reducido del espacio, Schröder ha sido capaz de mostrar su teoría de la arquitectura y, al mismo tiempo, de crear unos espacios que pueden únicamente describirse como bellos.

Este artigo sobre a obra de Uwe Schröder foi escrito originalmente em alemão por Fabian Peters e publicado na revista Baumeister.

Este pequeno edifício residencial projetado pelo arquiteto e professor de arquitetura Uwe Schröder num terreno baldio no bairro de Poppelsdorf, em Bona, tem apenas seis apartamentos para estudantes. Apesar do espaço limitado, ele conseguiu demonstrar vividamente a sua teoria da arquitetura, criando espaços que só podem ser descritos como belos.

< Vault and timber roof over the apartment entrances | Bóveda y techo de madera sobre las entradas de los apartamentos | Abóbada e telhado de madeira sobre as entradas dos apartamentos (Stefan Müller)

> Plan of the neighborhood | Plano del barrio | Planta do bairro





The Haus am Burggarten is small, with a pair of compact flats on each floor. Sited in the former garden of a corner building of the Gründerzeit era (mid-to-late nineteenth century), the house now completes the perimeter of this block. Although the site offered enough depth for just one large room per flat, Schröder has been able to create an ingeniously designed and spatially captivating architectural structure whose small dimensions are scarcely noticeable.

Poppelsdorfboastsanalmostcompletely historicist neighborhood centered around an eighteenth-century Baroque pleasure palace. As in other areas of late-nineteenth and early-twentieth century urban expansion in Bonn, residential buildings three to four bays wide and

La Haus am Burggarten es pequeña, con un par de apartamentos por planta. Situada en el antiguo jardín de un edificio en chaflán del período *Gründerzeit* (entre mediados y finales del siglo XIX), la casa cierra ahora el perímetro de la manzana. Aunque el solar ofrecía profundidad para tan solo una habitación grande por apartamento, Schröder ha concebido una estructura espacial fascinante cuyas pequeñas dimensiones apenas se notan.

Poppelsdorf es casi en su totalidad un barrio de arquitectura historicista construido en torno a un palacio de recreo barroco del siglo XVIII. Como ocurre en otras zonas de desarrollo urbano durante finales del siglo XIX y principios del XX en Bonn, en él predominan los edificios residenciales de tres o cuatro crujías y tres alturas.

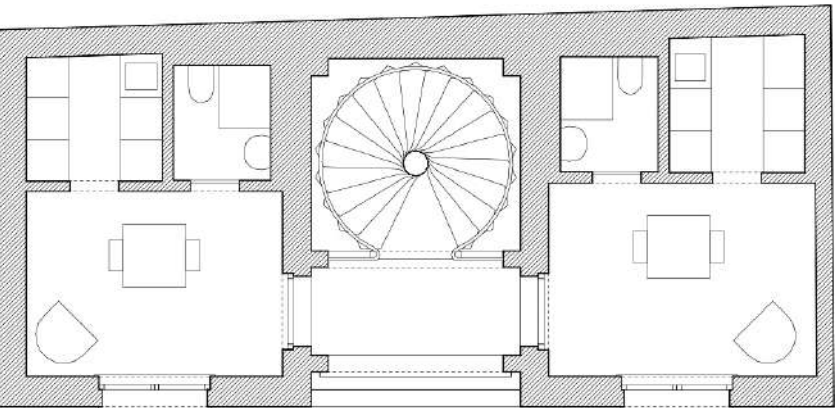
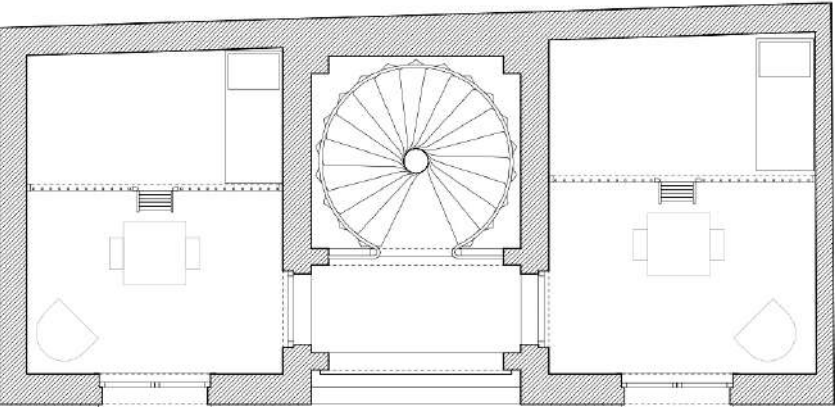
A Haus am Burggarten é pequena, com dois apartamentos compactos em cada andar. Localizada no antigo jardim de um edifício de esquina da era *Gründerzeit* (meados a final do século XIX), a casa completa agora o perímetro deste quarteirão. Embora o local oferecesse profundidade suficiente para apenas um quarto grande por apartamento, Schröder conseguiu criar uma estrutura arquitetónica engenhosamente projetada e espacialmente cativante, cujas pequenas dimensões são quase imperceptíveis.

Poppelsdorf possui um bairro quase totalmente historicista, centrado em torno de um palácio barroco do século XVIII. Tal como noutras áreas da expansão urbana do final do século XIX e início do século XX em Bona, predominam os edifícios residenciais com três a quatro

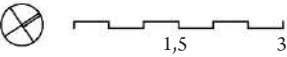
three stories high are prevalent. Brick facades, often in Bonn’s characteristic yellow tones, dominate the cityscape in many quarters. Schröder’s design is a clear continuation of this tradition, with a three-story residence behind a yellow-brick facade punctuated by tall, rectangular windows. Yet while the neighboring buildings consist mostly of solid masonry of the imperial era—simple designs from the pattern books of the time—Schröder has other design aspirations. An observer sees this at first glance, though it takes a moment to fully apprehend the succession of spaces.

Las fachadas de ladrillo, generalmente en los tonos amarillos característicos de Bonn, dominan el paisaje urbano en muchos barrios. El proyecto de Schröder mantiene claramente esta tradición con una residencia de tres plantas tras una fachada de ladrillo amarillo salpicada de ventanas rectangulares de gran altura. Sin embargo, mientras que los edificios colindantes son por lo general de fábrica maciza de época imperial –unos diseños sencillos sacados de muestrarios contemporáneos–, Schröder tenía otras ideas para su proyecto. Un observador lo nota a simple vista, aunque tarde un poco en entender completamente la sucesión de espacios.

tramos de largura e três andares de altura. As fachadas de tijolo, muitas vezes nos tons amarelos característicos de Bona, dominam a paisagem urbana em muitos bairros. O projeto de Schröder é uma clara continuação dessa tradição, com uma residência de três andares atrás de uma fachada de tijolos amarelos pontuada por janelas altas e retangulares. No entanto, enquanto os edifícios vizinhos consistem principalmente em alvenaria sólida da era imperial — projetos simples dos livros de padrões de arquitetura da época —, Schröder tem outras aspirações de design. Um observador percebe isso à primeira vista, embora leve algum tempo para compreender totalmente a sucessão de espaços.



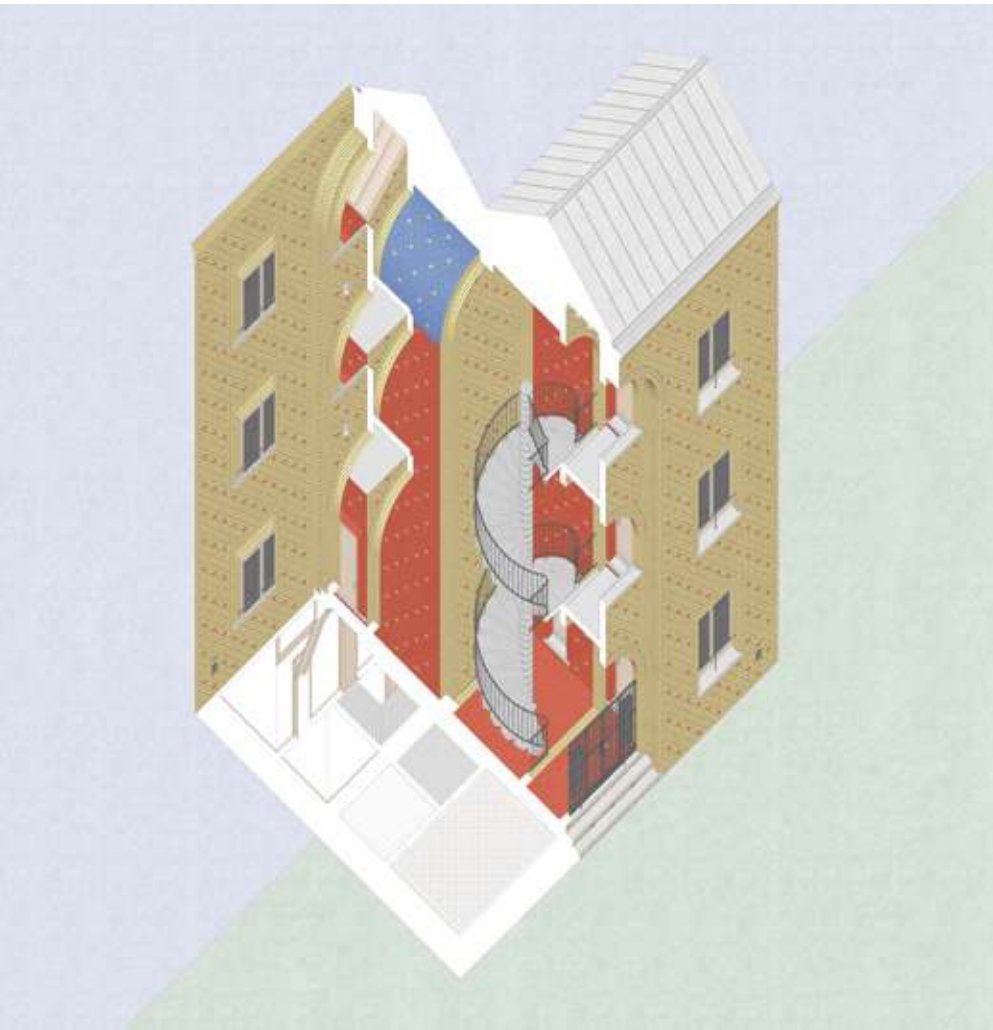
< 1: View of the building from Burggartenstraße 2: Elevation toward Burggartenstraße | 1: Vista del edificio desde la Burggartenstraße 2: Fachada hacia la Burggartenstraße | 1: Vista do edifício desde a Burggartenstraße 2: Fachada para Burggartenstraße (Stefan Müller)
> Apartment floor plan | Plantas de apartamento | Planta do apartamento



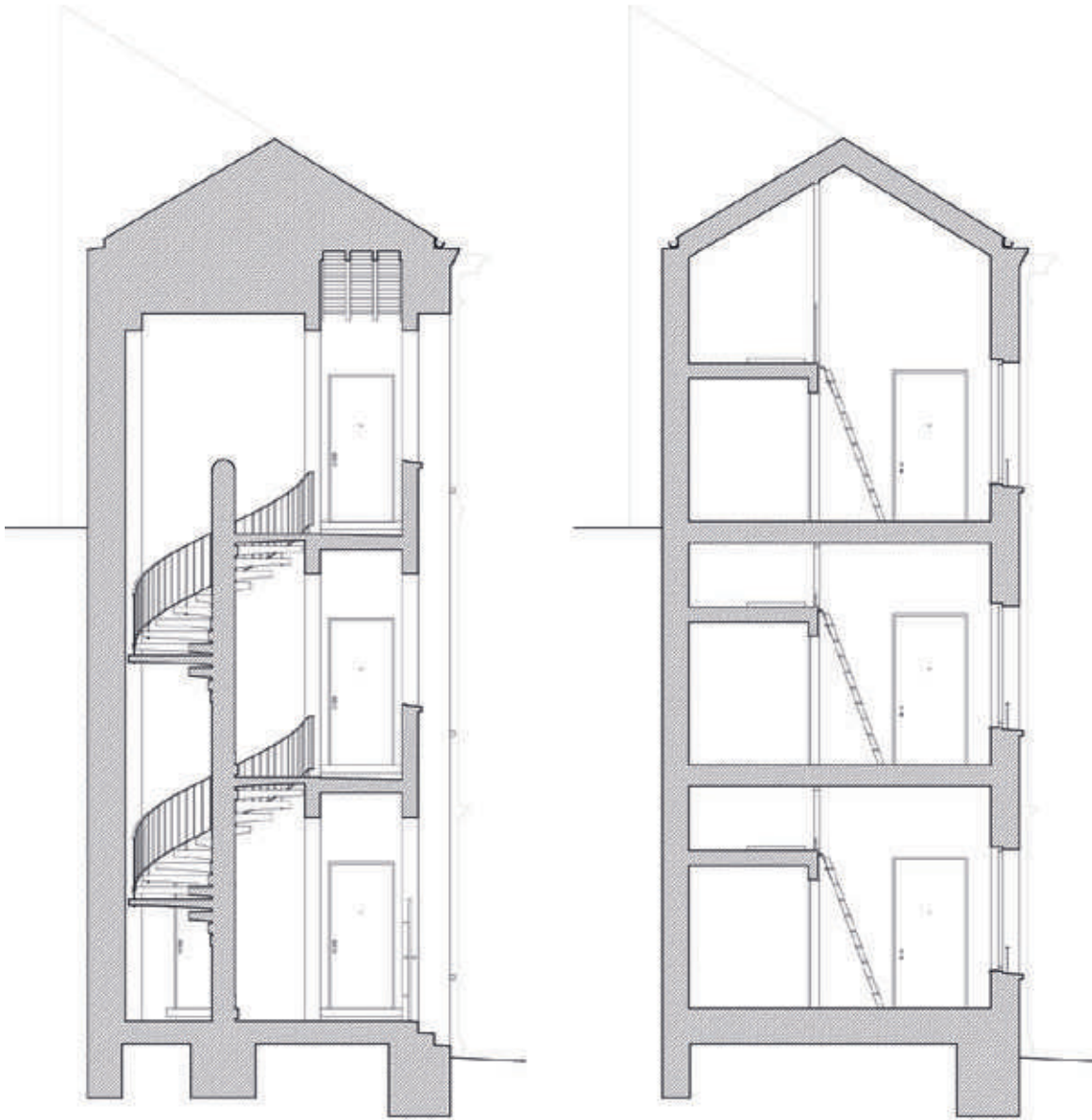
The spatial sequence connecting the frontage with the interior begins with a wide recess in the central bay, culminating in an arch below the eaves. At the bottom of this tall, niche-like recess are a few steps leading up to ground-floor level. The recessed facade section is opened up with three large arches one above the other, revealing loggia-like terraces. A further arch at the rear opens onto the staircase behind. These loggias thus function as bridges spanning the void between the two residential units, while creating a sense of depth thanks to the double or triple staggered arches.

La secuencia espacial que conecta la fachada con el interior comienza con un amplio retranqueo de la crujía central que culmina en un arco bajo los aleros. En la parte inferior de este retranqueo de gran altura, parecido a un nicho, unos cuantos peldaños llevan a la planta baja. La sección de fachada retranqueada se abre con tres grandes arcos superpuestos que revelan una especie de logias. Otro arco en la parte trasera se abre al hueco de la escalera de detrás. Así pues, estas logias funcionan como puentes que salvan el vano entre dos unidades residenciales y, a la vez, crean una sensación de profundidad gracias a los arcos escalonados dobles o triples.

A sequência espacial que liga a fachada ao interior começa com um amplo recuo no tramo central, culminando num arco abaixo do beiral. Na parte inferior deste recuo alto, semelhante a um nicho, encontram-se alguns degraus que conduzem ao piso térreo. A secção recuada da fachada é aberta com três grandes arcos, um acima do outro, revelando terraços semelhantes a lóginas. Um outro arco na parte traseira abre-se para a escadaria atrás. Estas lóginas funcionam assim como pontes que atravessam o vazio entre as duas unidades residenciais, criando uma sensação de profundidade graças aos arcos duplos ou triplos escalonados.



Axonometric view | Perspectiva axonométrica | Vista axonométrica



Entrance space and apartment sections | Secciones del espacio de entrada y de un apartamento | Secções do espaço de entrada e do apartamento

At first glance, the stairwell behind the loggias appears to be an inner courtyard inserted between the “bridges” and the building’s rear wall. This is because direct sunlight enters the stairwell from above, through the uppermost arched opening, making it stand out brightly in contrast to the two lower loggias, shaded by the houses opposite.

Schröder developed his Haus am Burggarten using three spatial categories that are to be found throughout his work of recent years, though they appear here in their briefest forms: “outer inner space”, “inner outer space”,

A simple vista, el hueco de la escalera detrás de las logias parece ser un patio interior encajado entre los “puentes” y el muro trasero del edificio. Esto es debido a que la luz del sol entra directamente en el hueco de la escalera desde arriba, a través del vano arqueado superior, lo que realza su luminosidad en comparación con las dos logias inferiores, que reciben la sombra de las casas de enfrente.

Schröder desarrolló la Haus am Burggarten mediante el uso de tres categorías espaciales que encontramos en sus obras más recientes, aunque en este caso aparecen en su forma más sucinta:

À primeira vista, a escadaria atrás das lóginas parece ser um pátio interno inserido entre as «pontes» e a parede traseira do edifício. Isso ocorre porque a luz solar direta entra na escadaria por cima, através da abertura arqueada superior, fazendo com que ela se destaque, de forma brilhante, em contraste com as duas lóginas inferiores, sombreadas pelas casas em frente.

Schröder desenvolveu a sua Haus am Burggarten utilizando três categorias espaciais que se encontram em toda a sua obra dos últimos anos, embora aqui apareçam nas suas formas mais



1: Arch construction over falsework 2: Completion of the vault 3: Laying of bricks on the main facade 4: Integration of the arch and gable | 1: Construcción de arco sobre cimbra 2: Bóveda terminada 3: Colocación de ladrillos en la fachada principal 4: Integración de arco y cubierta a dos aguas | 1: Construção do arco sobre os cimbres 2: Conclusão da abóbada 3: Colocação de tijolos na fachada principal 4: Integração do arco e da empena

and “inner inner space”. Here, the outer inner space—the public space facing the city—takes the form of the facade recess and open ground-floor loggia. It is such spaces, as Schröder puts it, that generate the city. Moreover, this space allows the building to take center stage, to make its appearance. The inner outer space, the courtyard—a key element in Schröder’s theory—appears here in the form of the open staircase. This is a

“espacio interior exterior”, “espacio exterior interior”, y “espacio interior interior”. Aquí, el espacio interior exterior —el espacio público que da a la ciudad— adopta la forma de fachada retranqueada y logia abierta en la planta baja. Estos espacios, tal como dice Schröder, son los que crean ciudad. Por otra parte, este espacio permite que el edificio sea el centro de atención. El espacio exterior interior, es decir, el patio —un elemento

sucintas: «espacio interior exterior», «espacio exterior interior» e «espacio interior interior». Aquí, o espaço interior exterior — o espaço público virado para a cidade — assume a forma do recuo da fachada e da lógia aberta no piso térreo. São esses espaços, como diz Schröder, que geram a cidade. Além disso, esse espaço permite que o edifício assumo o protagonismo, que se destaque. O espaço exterior interior, o pátio — um elemento-

covered courtyard, as Schröder roofs it over with a barrel vault, which outside onlookers notice only at a second glance. The large arched openings give the space its courtyard character. This device results in a simultaneously open yet sheltered center of the building, without the usual shaft-like appearance. At the same time, the spiral staircase occupying most of this space makes it the house’s central means of access.

fundamental de la teoría de Schröder—adopta aquí la forma de una escalera abierta. Se trata de un patio cubierto, ya que Schröder lo techa con una bóveda de cañón, que desde fuera no se percibe a simple vista. Los grandes vanos arqueados confieren a este espacio su carácter de patio. Con este recurso, se consigue que el centro del edificio esté abierto a la vez que protegido, sin el típico aspecto de tiro. Al mismo tiempo, la escalera de caracol que ocupa casi todo este espacio es el acceso principal del edificio.

chave na teoria de Schröder — aparece aqui na forma da escadaria aberta. Trata-se de um pátio coberto, pois Schröder cobriu-o com uma abóbada de berço, que os observadores externos só percebem à segunda vista. As grandes aberturas em arco conferem ao espaço o seu caráter de pátio. Esta disposição resulta num centro do edifício simultaneamente aberto e protegido, sem a aspeto habitual de poço vertical. Ao mesmo tempo, a escadaria em espiral que ocupa a maior parte deste espaço torna-o o meio de acesso central da casa.



Brick-walled stairwell | Hueco de escalera con muros de ladrillo | Vão de escada com muros de tijolo (Stefan Müller)



Vaulted space over the spiral staircase | Espacio abovedado sobre la escalera de caracol | Espaço abobadado sobre a escadaria em espiral (Stefan Müller)

Finally, the inner inner spaces, the student flats forming self-contained units, adjoin the courtyard and are accessed through it. Thus, due to the site's extreme limitations, Schröder had to reduce the three core components of his architecture to the bare essentials. But he manages to avoid abstracting them into empty gestures by retaining

Por último, los espacios interiores interiores, es decir, los apartamentos de estudiantes que constituyen unidades independientes, lindan con el patio a través del cual se accede a ellos. Así pues, dadas las sumas limitaciones del solar, Schröder tuvo que reducir los tres elementos fundamentales de su arquitectura a lo estrictamente necesario.

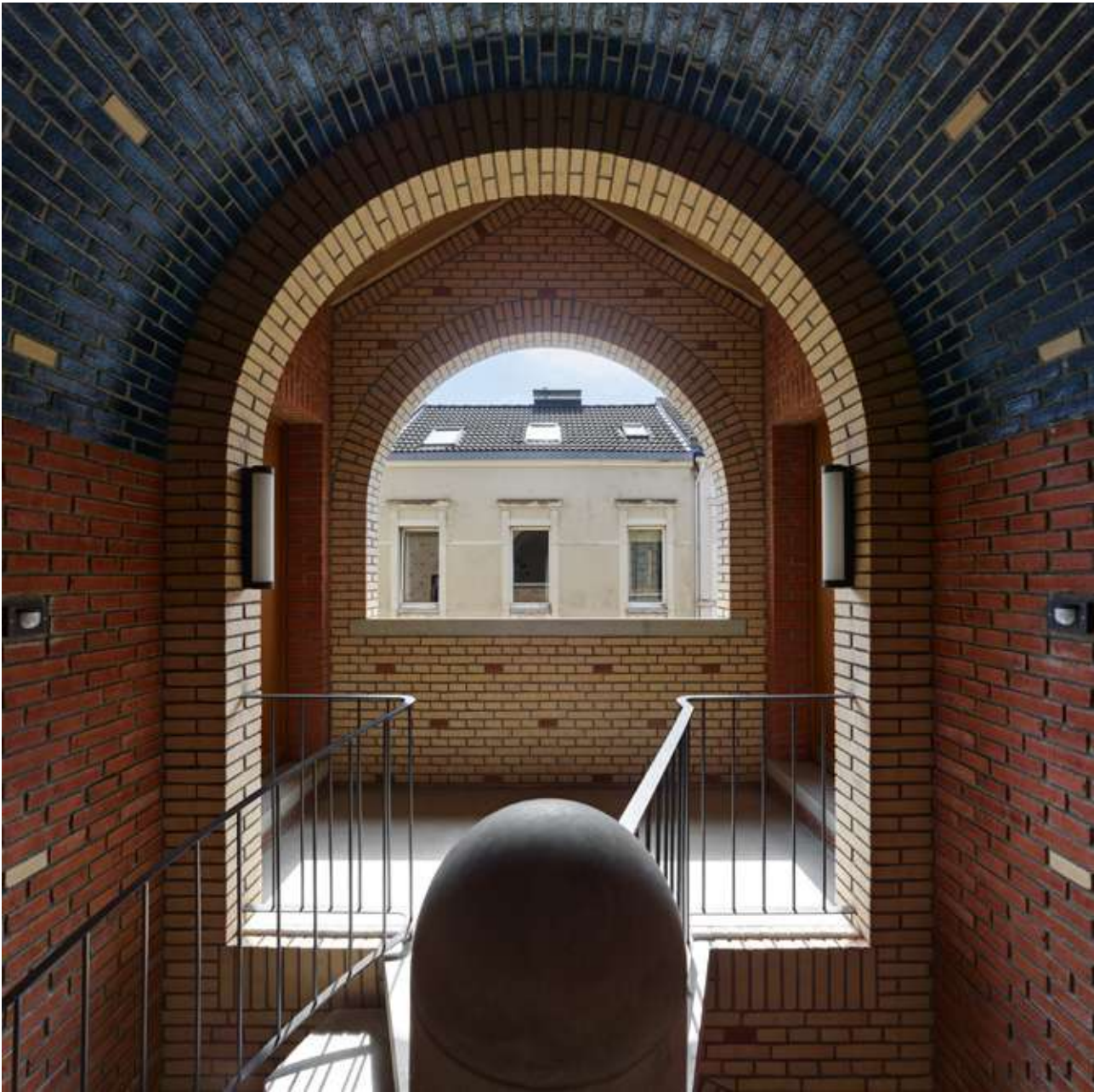
Por fim, os espaços interiores interiores, os apartamentos dos estudantes que formam unidades independentes, ficam junto ao pátio e são acessíveis através dele. Assim, devido às limitações extremas do local, Schröder teve de reduzir os três componentes principais da sua arquitetura ao essencial. Mas ele consegue evitar abstraí-los em gestos

their vital functions. This applies to the vestibule through which visitors enter as well as to the stairwell, with which he has created a truly open space at the building's center.

Sin embargo, el arquitecto consigue no convertirlos en gestos gratuitos, ya que mantienen sus funciones esenciales. Esto se observa en el vestíbulo de entrada, así como en el hueco de la escalera, con los que ha creado un espacio realmente abierto en el centro del edificio.

vazios, mantendo as suas funções vitais. Isto aplica-se ao vestíbulo por onde os visitantes entram, bem como à escadaria, com a qual ele criou um espaço verdadeiramente aberto no centro do edifício.

View from the stairs | Vista desde la escalera | Vista da escadaria (Stefan Müller)



The barrel vault Schröder uses to cover the stairwell is of blue glazed clinker brick. This color scheme is part of a system of signs and references that Schröder applies in his architecture, in which differently colored bricks have a key role. First he differentiates load-bearing and non-load-bearing walls: thus the house’s facade and rear wall, as load-bearing structures, are built of yellow brick. The half-brick walls that separate the stairwell and loggias from the flats, on the other hand, are of red brick. These walls are not of a single

La bóveda de cañón que Schröder utiliza para cubrir el hueco de la escalera es de ladrillo clinker vidriado de color azul. Esta composición cromática forma parte de un sistema de signos y referencias que Schröder aplica en su arquitectura, en la que los ladrillos de distintos colores tienen un papel clave. En primer lugar, Schröder diferencia entre muros portantes y no portantes: así pues, la fachada y el muro posterior, como estructuras de carga, son de ladrillo amarillo. Por otra parte, los muros de ladrillo de medio pie que separan el hueco de la escalera y las logias

A abóbada de berço que Schröder usa para cobrir a escadaria é feita de tijolos clinquer esmaltados em azul. Esse esquema de cores faz parte de um sistema de sinais e referências que Schröder aplica na sua arquitetura, no qual tijolos de cores diferentes têm um papel fundamental. Primeiro, ele diferencia paredes estruturais e não estruturais: assim, a fachada e a parede traseira da casa, como estruturas de suporte de carga, são construídas com tijolos amarelos. As paredes de meio tijolo que separam a escadaria e as lóginas dos apartamentos,



< Access to the top-floor apartments | Acceso a los apartamentos de la planta superior | Acesso aos apartamentos do último piso (Stefan Müller)
> Stars at the top of the stairs | Estrellas en lo alto de la escalera | Estrelas no topo da escadaria (Stefan Müller)



color, however, but rather are dotted with contrasting individual bricks in a diagonal pattern. Schröder thus incorporates polychromy, a feature of historicist architecture, and connects his design with the surrounding buildings. Another reason for this ornamentation is to make the building’s proportions easier to apprehend by allowing our eyes to follow these orthogonal and diagonal lines.

The blue barrel vault is also interspersed with individual yellow bricks, adding a layer of symbolism, as the composition evokes a starry sky. Although vaults decorated with stars date back almost a millennium in architecture, Schröder

de los apartamentos, son de ladrillo rojo. Sin embargo, estos muros no son de un solo color, sino que están salpicados de ladrillos que contrastan y crean un motivo diagonal. Schröder incorpora así la policromía, una característica de la arquitectura historicista y con ello conecta su proyecto con los edificios circundantes. Otro motivo para utilizar esta ornamentación es facilitar la comprensión de las proporciones del edificio, al facilitar que la vista siga las líneas perpendiculares y diagonales.

La bóveda de cañón azul también está intercalada de ladrillos amarillos que añaden una capa simbólica, ya que la composición sugiere el cielo estrellado. Aunque las bóvedas decoradas con

por outro lado, são de tijolo vermelho. No entanto, estas paredes não são de uma única cor, mas sim pontilhadas com tijolos individuais contrastantes num padrão diagonal. Schröder incorpora assim a policromia, uma característica da arquitetura historicista, e liga o seu projeto aos edifícios circundantes. Outra razão para esta ornamentação é tornar as proporções do edifício mais fáceis de apreender, permitindo que os nossos olhos sigam estas linhas ortogonais e diagonais.

A abóbada de berço azul também é intercalada com tijolos amarelos individuais, adicionando uma camada de simbolismo, já que a composição evoca um céu estrelado. Embora as abóbadas

is referring specifically to nineteenth-century Romanticism. Schinkel’s famous Hall of Stars in his stage scenery for Mozart’s *Magic Flute* was a particular source of inspiration here.

The reference to German Romanticism, to which Schinkel’s design is unmistakably indebted, is interwoven with Schröder’s aesthetic notions. For a long time, he explains, he believed Schiller’s famous definition that “Beauty is nothing less than freedom in appearance”. Over the years, however, he realized that this no longer quite suited his own ideal of beauty. He

estrellas se remontan a casi un milenio en la arquitectura, Schröder hace aquí referencia concretamente al Romanticismo del siglo XIX. El famoso Salón de las Estrellas de la escenografía de Schinkel para la *Flauta Mágica* de Mozart fue su fuente de inspiración.

La referencia al Romanticismo alemán, con el que sin ningún género de duda el proyecto de Schinkel está en deuda, se entreteje con las ideas estéticas de Schröder. Según dice, durante mucho tiempo creyó la famosa frase de Schiller de que “la belleza es nada menos que la libertad en la apariencia”. No obstante,

decoradas com estrelas remontem a quase um milénio atrás na arquitetura, Schröder refere-se especificamente ao Romantismo do século XIX. O famoso Salão das Estrelas de Schinkel, no seu cenário para *A Flauta Mágica*, de Mozart, foi aqui uma fonte de inspiração particular.

A referência ao Romantismo Alemão, ao qual o projeto de Schinkel é inequivocamente devedor, é combinada com as noções estéticas de Schröder. Durante muito tempo, explica ele, acreditou na famosa definição de Schiller de que «a beleza nada mais é do que

became fascinated by the metaphysical aspect of aesthetics, as exemplified by Friedrich Wilhelm Schelling, who regarded beauty as “the infinite finitely represented” and saw architecture as an art form in which function and symbolism are inextricably linked. This led him to the realization that it is not enough to appeal to the observer’s or occupant’s senses through materiality. There must always be a reference to something that transcends the material. This might be a brick-built starry canopy over a courtyard, or the diamond shapes inlaid in the flats’ parquet floors, alluding to the suit of cards. Each flat is

con el paso de los años, se dio cuenta de que ésta ya no respondía a su ideal de belleza. Schröder quedó fascinado por el aspecto metafísico de la estética de Friedrich Wilhelm Schelling, quien consideraba la belleza como “lo infinito representado de manera finita” y veía la arquitectura como una forma de arte en la que función y simbolismo están indisolublemente unidos. Esta idea le llevó a comprender que no basta con gustar al observador o al ocupante a través de las apariencias, sino que siempre debe haber una referencia a algo que trascienda lo material. Esta referencia puede ser una bóveda de ladrillo estrellada para cubrir

liberdade na aparência». Ao longo dos anos, porém, percebeu que isso já não se adequava ao seu próprio ideal de beleza. Tornou-se fascinado pelo aspeto metafísico da estética, exemplificado por Friedrich Wilhelm Schelling, que considerava a beleza como «o infinito finitamente representado» e via a arquitetura como uma forma de arte na qual a função e o simbolismo estão intrinsecamente ligados. Isso levou-o à conclusão de que não basta apelar aos sentidos do observador ou do ocupante através da materialidade. Deve haver sempre uma referência a algo que transcenda o material. Pode ser uma



Apartment interior with mezzanine space over the kitchen and bathroom | Interior de un apartamento con altillo sobre la cocina y el cuarto de baño | Interior do apartamento com mezanino sobre a cozinha e a casa de banho (Stefan Müller)



Top-floor apartment interior with mezzanine space over the kitchen and bathroom | Interior de un apartamento de la última planta con altillo sobre la cocina y el cuarto de baño | Interior do apartamento do último piso com mezanino sobre a cozinha e a casa de banho (Stefan Müller)

assigned a number from one to six. What initially appears to be an allusion to the diamond motif on the facade turns out, on closer inspection, to evoke a cohesive community inside the building. This combination of ornament and symbol in Haus am Burggarten is what gives it its special charm, and could be illustrated with many examples. It also shows how the architect has sought through this building to fulfil an exhortation of the poet Novalis: “The world must be romanticized. In this way its original meaning will be rediscovered.”

un patio, o las incrustaciones de madera en forma de diamante en los suelos de parqué de los apartamentos, que hacen alusión a los naipes de la baraja. A cada apartamento se le ha asignado un número del uno al seis. Lo que en un principio parece ser una alusión al motivo de diamante de la fachada, resulta que sugiere una comunidad cohesionada dentro del edificio. Esta combinación de ornamentos y símbolos de la Haus am Burggarten es lo que le otorga su especial encanto, del que podrían ponerse muchos ejemplos. También muestra que, con este edificio, el arquitecto ha querido responder al llamamiento del poeta Novalis: “Hay que idealizar el mundo. Así se descubrirá de nuevo su significado original”.

The project was made possible by the collaboration of a dedicated team of professionals in the office of Uwe Schröder Architekt, including Matteo Casola, Timo Steinmann, and Matthias Storch. The house was built by a range of craftspeople and specialist firms: shell construction by Kratz Bauunternehmung GmbH (Bonn); brickwork by BauCeram GmbH (Alfter); carpentry and roofing by Roggendorf Bedachungen GmbH (Meckenheim); interior and exterior plastering by Ness-Bau GmbH (Alfter); tiling by Helmut Simon (Hennef); screed work by Bektas Estrich (Bonn); joinery by Bleialfer Schreinerwerkstätten Michels GmbH (Bleialf); parquet flooring by Parkett Weber GmbH (Alfter); prefabricated concrete stairs by Gilne GmbH (Mettingen); metalwork by Niehöfer Inh. G. Kotzian (Overath); heating, ventilation, and plumbing by Bliersbach Haustechnik GmbH (Bonn); and electrical work by Elektro Johannes Schmitz GmbH (Lohmar).

El proyecto fue posible gracias a la colaboración de un equipo de entregados profesionales del estudio Uwe Schröder Architekt, entre los que se encuentran Matteo Casola, Timo Steinmann y Matthias Storch. La casa la construyeron una serie de artesanos y empresas especializadas: construcción del almacén realizada por Kratz Bauunternehmung GmbH (Bonn); mampostería de BauCeram GmbH (Alfter); carpintería exterior y cubiertas de Roggendorf Bedachungen GmbH (Meckenheim); enyesado interior y exterior de Ness-Bau GmbH (Alfter); alicatado de Helmut Simon (Hennef); soleras de Bektas Estrich (Bonn); carpintería de Bleialfer Schreinerwerkstätten Michels GmbH (Bleialf); parqué de Parkett Weber GmbH (Alfter); escaleras de hormigón prefabricadas de Gilne GmbH (Mettingen); metalistería de Niehöfer Inh. G. Kotzian (Overath); calefacción, ventilación y fontanería de Bliersbach Haustechnik GmbH (Bonn); y trabajos eléctricos realizados por Elektro Johannes Schmitz GmbH (Lohmar).

cobertura estrelada construída em tijolo sobre um pátio ou as formas de diamante incrustadas nos pisos de parquet dos apartamentos, aludindo ao naipe de cartas. A cada apartamento é atribuído um número de um a seis. O que inicialmente parece ser uma alusão ao motivo de diamante na fachada acaba, numa inspeção mais atenta, por evocar uma comunidade coesa dentro do edifício. Esta combinação de ornamento e símbolo na Haus am Burggarten é o que lhe confere o seu encanto especial, e pode ser ilustrada com muitos exemplos. Mostra também como o arquiteto procurou, através deste edifício, concretizar uma exortação do poeta Novalis: «O mundo deve ser romantizado. Desta forma, o seu significado original será redescoberto.»

O projeto foi possível graças à colaboração de uma equipa dedicada de profissionais do escritório Uwe Schröder Architekt, incluindo Matteo Casola, Timo Steinmann e Matthias Storch. A casa foi construída por uma série de artesãos e empresas especializadas: construção da armadura da casa pela Kratz Bauunternehmung GmbH (Bona); alvenaria pela BauCeram GmbH (Alfter); carpintaria e telhados pela Roggendorf Bedachungen GmbH (Meckenheim); reboco interior e exterior pela Ness-Bau GmbH (Alfter); azulejos por Helmut Simon (Hennef); a regularização dos pavimentos pela Bektas Estrich (Bona); a marcenaria pela Bleialfer Schreinerwerkstätten Michels GmbH (Bleialf); pavimentos em parquet pela Parkett Weber GmbH (Alfter); escadas pré-fabricadas em betão pela Gilne GmbH (Mettingen); trabalhos em metal pela Niehöfer Inh. G. Kotzian (Overath); aquecimento, ventilação e canalização pela Bliersbach Haustechnik GmbH (Bona); e trabalhos elétricos pela Elektro Johannes Schmitz GmbH (Lohmar).

Biography | Biografia | Biografia

Uwe Schröder

Uwe Schröder studied architecture at the Rheinisch-Westfälische Technische Hochschule in Aachen (RWTH) and the Düsseldorf Art Academy. Since 1993 he has had his own practice in Bonn. After holding teaching positions in Bochum and Cologne, he was a professor of design and architectural theory at the Cologne University of Applied Sciences from 2004 to 2008, and he has been a professor at the Department of Spatial Design in the Faculty of Architecture at RWTH Aachen University since 2008. He has been a guest professor at Università di Bologna (2009-2010), Università degli Studi di Napoli (2016), Politecnico di Bari (2016), Università degli Studi di Catania (2018), Politecnico di Milano (2018-2019), Università di Parma (2020-2021), and Università di Bologna (2024-2025).

Uwe Schröder estudió arquitectura en la Rheinisch-Westfälische Technische Hochschule de Aquisgrán (RWTH) y en la Academia de Bellas Artes de Düsseldorf. Desde 1993 tiene su propio estudio en Bonn. Tras ejercer como profesor en Bochum y Colonia, fue catedrático de proyectos y teoría de la arquitectura en la Universidad de Ciencias Aplicadas de Colonia entre 2004 y 2008; desde esta fecha ha sido catedrático del Departamento de Diseño Espacial de la Escuela de Arquitectura de la Universidad de Aquisgrán RWTH. Ha sido profesor invitado en la Università di Bologna (2009-2010), Università degli Studi di Napoli (2016), Politecnico di Bari (2016), Università degli Studi di Catania (2018), Politecnico di Milano (2018-2019), Università di Parma (2020-2021), y Università di Bologna (2024-2025).

Uwe Schröder estudou arquitetura na Rheinisch-Westfälische Technische Hochschule em Aachen (RWTH) e na Academia de Arte de Düsseldorf. Desde 1993, tem o seu próprio escritório em Bona. Depois de lecionar em Bochum e Colónia, foi professor de design e teoria da arquitetura na Universidade de Ciências Aplicadas de Colónia de 2004 a 2008 e, desde 2008, é professor no Departamento de Design Espacial da Faculdade de Arquitetura da Universidade RWTH de Aachen. Foi professor convidado na Università di Bologna (2009-2010), Università degli Studi di Napoli (2016), Politecnico di Bari (2016), Università degli Studi di Catania (2018), Politecnico di Milano (2018-2019), Università di Parma (2020-2021) e Università di Bologna (2024-2025).

Reflections on the Rehabilitation of a Masía Farmhouse in Les Gavarres, Province of Girona

Oriol Roselló
Viñas

Consideraciones sobre la rehabilitación de una masía en Las Gavarres, Gerona

Considerações sobre a reabilitação de uma masía em Les Gavarres, Girona

Introduction to the *Masía* Farmhouse

Masía farmhouses are the quintessential building type of the Catalan countryside, accompanying the arable and livestock farms that have structured this land and society since the late Middle Ages (Camps i Arboix 1959). Over more than 2000 years they have constantly adapted to evolving farming systems and aesthetic requirements. Thus, despite many attempts to classify them in definite typologies, each *masía* is an exception to the rule (Moner and Puigvert 2010).

Una introducción a la tipología de masía

Las masías representan la tipología identitaria por excelencia del paisaje rural de Cataluña. Se trata de fincas de explotación agroganadera que han estructurado el territorio y la sociedad desde la Baja Edad Media (Camps i Arboix 1959). A lo largo de más de 2.000 años las masías se han adaptado constantemente a nuevos sistemas de producción y a diferentes requerimientos estéticos. Así, pese a los numerosos intentos realizados para clasificarlas en tipologías definidas, cada masía constituye una excepción a la regla (Moner y Puigvert 2010).

Uma introdução à tipologia da *masía*

As *masías* representam a tipologia identitária por excelência da paisagem rural da Catalunha. Tratam-se de propriedades agrícolas e pecuárias que estruturaram o território e a sociedade desde a Baixa Idade Média (Camps e Arboix, 1959). Ao longo de mais de 2.000 anos, as *masías* adaptaram-se constantemente a novos sistemas de produção e a diferentes requisitos estéticos. Assim, apesar das inúmeras tentativas de classificá-las em tipologias definidas, cada *masia* constitui uma exceção à regra (Moner e Puigvert, 2010).



< Thin-tile vaulted staircase | Escalera de bóveda tabicada | Escada de abóbada de tijolo (Antonio Navarro Wijkmark)

> Restored *masía* situated within the characteristic landscape of the area | Masía rehabilitada y entorno paisajístico característico del lugar | *Masía* restaurada junto à paisagem característica do local (Antonio Navarro Wijkmark)

As a result of migration from the country to cities in the late nineteenth century and of farm policies more recently, many of these traditional buildings have lost their original function. From the 1960s, *masías* started to become second homes for urban elites.

In this context, our architecture firm has specialized over the last 30 years in rehabilitating these farmhouses. We find that thanks to these new uses, many traditional building techniques and local artisans have been protected from the excessive industrialization of building processes.

Como consecuencia del éxodo rural hacia las ciudades a finales del siglo XIX y de las políticas agroganaderas más recientes, gran parte de estas edificaciones tradicionales han perdido su función original. A partir de los años sesenta las masías comenzaron a convertirse en segundas residencias para las élites urbanas.

En este contexto, nuestro estudio de arquitectura se ha especializado durante los últimos 30 años en la rehabilitación de masías. Podemos constatar que, gracias a esta nueva realidad, muchas técnicas constructivas tradicionales y artesanos locales han logrado mantenerse a salvo de la excesiva industrialización de los procesos constructivos.

Como consequência do êxodo rural para as cidades no final do século XIX e das políticas agrícolas e pecuárias mais recentes, grande parte destas construções tradicionais perderam a sua função original. A partir da década de 1960, as *masías* começaram a tornar-se segundas residências para as elites urbanas.

Neste contexto, o nosso gabinete de arquitetura especializou-se, nos últimos 30 anos, na reabilitação de *masías*. Podemos constatar que, graças a esta nova realidade, muitas técnicas de construção tradicionais e artesãos locais conseguiram manter-se a salvo da industrialização excessiva dos processos de construção.

Location of the estate in the Baix Empordà region, within the Les Gavarres Natural Park | Situación de la finca en la comarca del Bajo Ampurdán, dentro del parque natural de Las Gavarres | Localização da propriedade na comarca do Baix Empordà, dentro do parque natural de Les Gavarres (1: Institut Cartogràfic i Geològic de Catalunya 2: Google Earth)



Analysis of the Site and the Commission

The property is remarkable for its scenic setting in the hills of Les Gavarres, 1 km or so from the hamlet of Sant Sadurní de l'Heura. The farmhouse boasts exceptional views over the hills to the west and the picturesque village of Madremanya farther north.

The client chose us for our long experience of rehabilitating farmhouses and our commitment to factoring in criteria of sustainability. Although he lives in Andorra, he normally comes to the property weekly to enjoy life in this rural environment. He tends to the woodland himself and roams the local paths on foot or by bicycle. Fond of the countryside and of life in nature, his

Análisis del emplazamiento y del encargo del promotor

Su privilegiado emplazamiento, en pleno macizo de Las Gavarres y a poco más de un kilómetro de la localidad de San Sadurní de l'Heura, constituía el rasgo más característico de la finca. Desde la masía se disfrutaban unas vistas excepcionales del macizo hacia poniente y de la pintoresca población de Madremaña en dirección noroeste.

El cliente nos eligió por nuestra amplia experiencia en la rehabilitación de masías, así como por nuestro compromiso con la incorporación de criterios de sostenibilidad. Aunque reside en Andorra, tiene por costumbre desplazarse cada semana a esta finca, donde vive con intensidad el entorno rural. Él mismo se

Análise da localização e incumbência do promotor

A sua localização privilegiada, no coração do maciço de Les Gavarres e a pouco mais de um quilómetro da localidade de Sant Sadurní de l'Heura, era a característica mais marcante da propriedade. A partir da *masía*, é possível desfrutar de vistas excecionais do maciço a oeste e da pitoresca vila de Madremanya a noroeste.

O cliente escolheu-nos pela nossa vasta experiência na reabilitação de *masías*, bem como pelo nosso compromisso com a incorporação de critérios de sustentabilidade. Embora resida em Andorra, tem o hábito de se deslocar todas as semanas a esta propriedade, onde vive intensamente o ambiente rural. Ele próprio encarrega-se da manutenção da

Southwest corner of the *masía* seen from the swimming pool | Esquina suroeste de la masía desde la piscina | Canto sudoeste da *masía* visto a partir da piscina (Antonio Navarro Wijkmark)





Main façade before and after the restoration | Fachada principal antes y después de la intervención | Fachada principal antes e depois da intervenção (1, 2: Archivo Bangolo 3: Antonio Navarro Wijkmark)

main object was to make the most of the vistas offered by the location.

He also asked for the interior to be made brighter and the house to be given high eco-efficiency, according to the strictest standards. Despite these alterations, he was adamant that the original features of the *masía* should be preserved. The main challenge in the design phase was therefore to strike a careful balance between the functional upgrade needed and fidelity to this built heritage.

encarga del mantenimiento del bosque y recorre a pie o en bicicleta los caminos de la comarca. Amante del paisaje y de la vida en la naturaleza, su principal premisa era poder disfrutar plenamente de las vistas que el lugar ofrece.

También nos solicitó que el espacio interior ganara en luminosidad y que se incorporara un alto nivel de ecoeficiencia, conforme a los estándares más exigentes. Apesar de estas transformaciones, insistió en que no se traicionaran los valores originales de la *masía*. El principal reto durante la fase de proyecto consistió, por tanto, en encontrar un equilibrio delicado entre la necesaria actualización funcional y la fidelidad a la memoria construida.

floresta e percorre a pé ou de bicicleta os caminhos da região. Amante da paisagem e da vida na natureza, a sua principal premissa era poder desfrutar plenamente das vistas que o local oferece.

Pediu-nos também que o espaço interior ganhasse mais luminosidade e que fosse incorporado um alto nível de ecoeficiência, de acordo com os padrões mais exigentes. Apesar dessas transformações, ele insistiu que os valores originais da *masía* não fossem esquecidos. O principal desafio durante a fase de projeto consistiu, portanto, em encontrar um equilíbrio delicado entre a necessária atualização funcional e a fidelidade à memória construída.

The property, extending over just 2 ha, contains the Can Fruitós *masía* farmhouse, with two floors and a built area of 280 m², a little stable of 25 m² on the north side, and a swimming pool in the southwest corner. The buildings were in a reasonable state of repair following a refurbishment in the 1980s and relatively constant maintenance thereafter. But the house was arranged in a dysfunctional way, with low, dark, confined spaces. It also had obsolete facilities, an unsealed building envelope, and various finishes not in keeping with the character of a traditional *masía*.

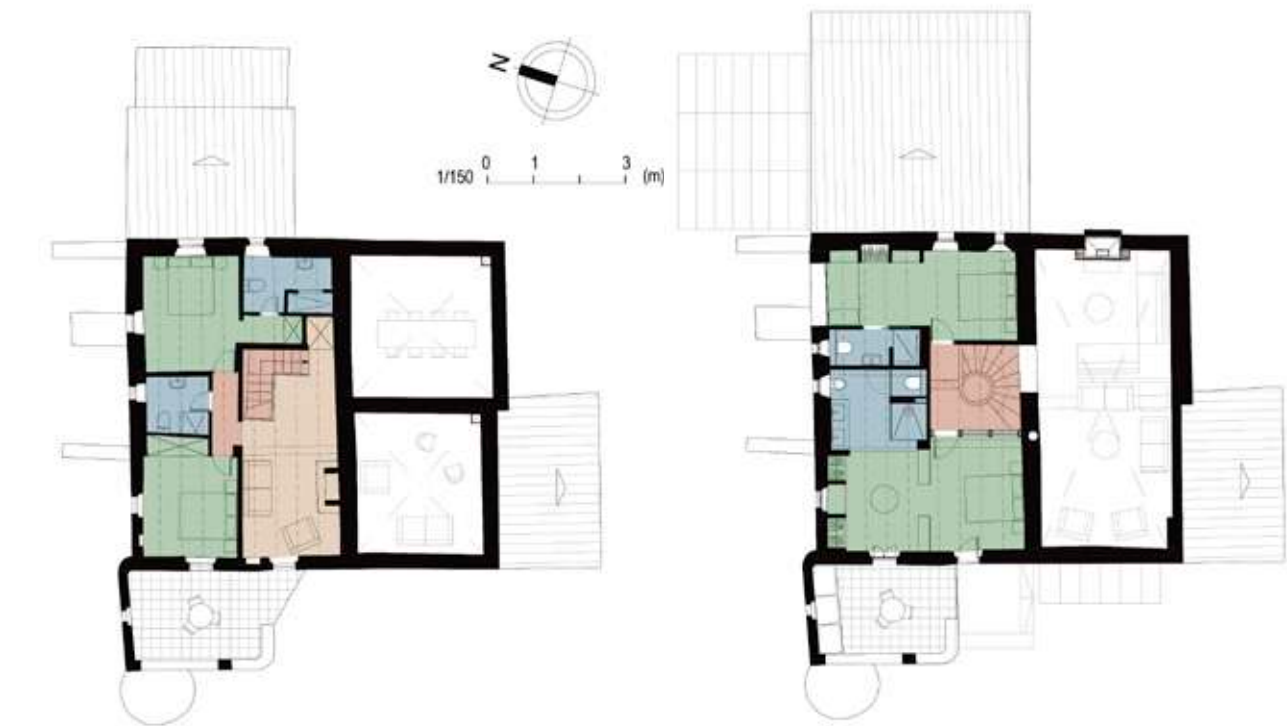
La finca, de apenas 2 hectáreas de superficie, alberga la *masía* de Can Fruitós, de dos plantas y 280 m² construidos, una pequeña caballeriza de tan solo 25 m² en el extremo norte y una piscina situada en la esquina suroeste. Las edificaciones se encontraban en un estado de conservación razonable, gracias a una rehabilitación realizada en los años ochenta y a un mantenimiento posterior relativamente constante. No obstante, la *masía* presentaba una distribución poco funcional, con espacios bajos, oscuros y cerrados. Además, contaba con instalaciones obsoletas, cerramientos no estancos y una variedad de acabados inapropiados, que no respetaban el carácter de una *masía* tradicional.

A propriedade, com apenas 2 hectares de superfície, abriga a *masía* de Can Fruitós, com dois andares e 280 m² construídos, uma pequena cavaleriça de apenas 25 m² no extremo norte e uma piscina localizada no canto sudoeste. Os edifícios encontravam-se em razoável estado de conservação, graças a uma reabilitação realizada na década de 1980 e a uma manutenção posterior relativamente constante. No entanto, a *masía* apresentava uma distribuição pouco funcional, com espaços baixos, escuros e fechados. Além disso, tinha instalações obsoletas, compartimentos não estanques e uma variedade de acabamentos inadequados, que não respeitavam o caráter de uma *masía* tradicional.



Masía before and after the restoration | *Masía* antes y después de la intervención | *Masía* antes e depois da intervenção (2: Antonio Navarro Wijkmark)





Architectural Design

Our proposal for the rehabilitation of Can Fruitós reflected the principles that have always guided our firm’s strategy in the upgrades required in such farmhouses:

- Reorganizing interior spaces and removing corridors by means of eliminating rooms without natural ventilation or lighting, and assuring spatial fluidity between the dining room, kitchen, and living room.
- Designing a staircase broadly connecting the two floors that could

El proyecto arquitectónico

La propuesta de rehabilitación de Can Fruitós respondió a los principios que siempre han guiado la estrategia de nuestro estudio ante la necesaria actualización de una masía:

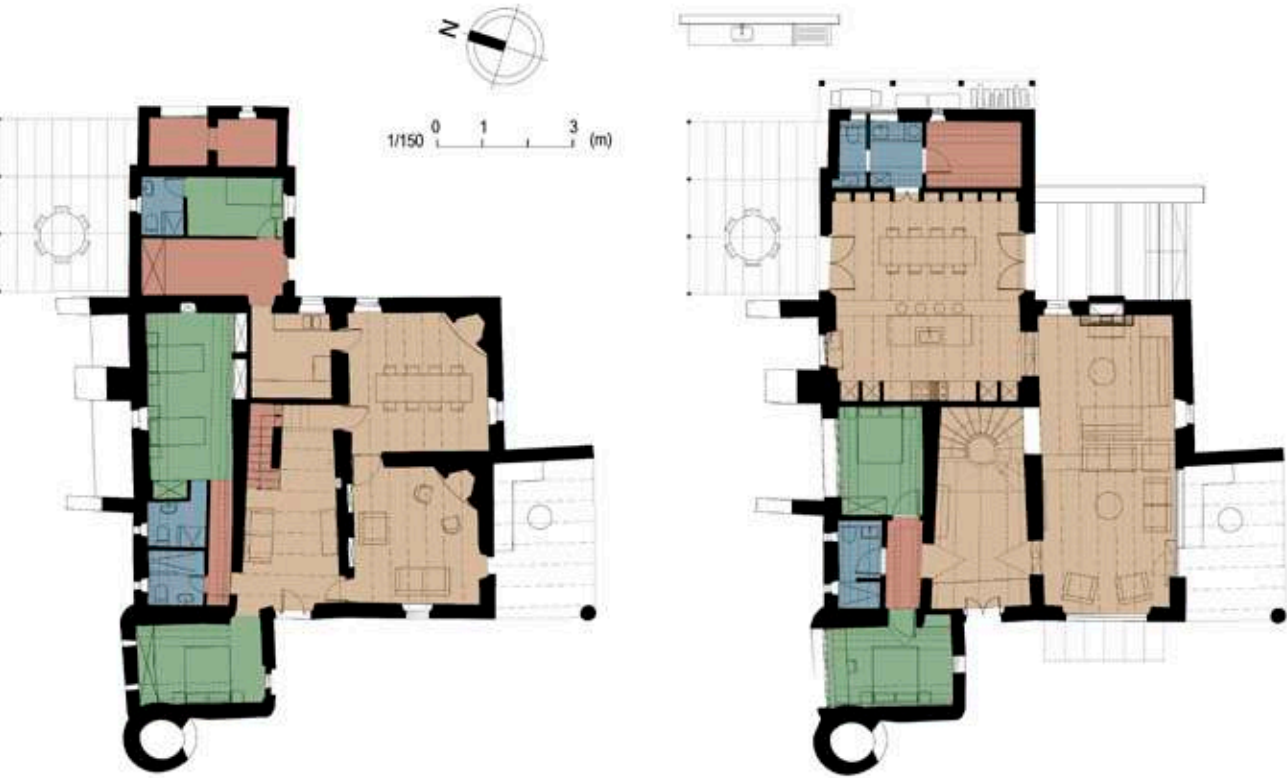
- Reorganizar los espacios interiores y evitar los pasillos, mediante la supresión de estancias sin ventilación o iluminación natural, y garantizar una fluidez espacial entre comedor, cocina y sala de estar.
- Diseñar una escalera que conecte ambas plantas de forma amplia, que

O projeto arquitetónico

A proposta de reabilitação de Can Fruitós respondeu aos princípios que sempre guiaram a estratégia do nosso estúdio face à necessária atualização de uma quinta:

- Reorganizar os espaços interiores e evitar corredores, através da supressão de divisões sem ventilação ou iluminação natural, e garantir uma fluidez espacial entre a sala de jantar, a cozinha e a sala de estar.
- Projetar uma escada que conecte amplamente os dois andares, que

Southwest corner before and after the restoration | Esquina suroeste antes y después de la intervención | Canto sudoeste antes e depois da intervenção (2: Antonio Navarro Wijkmark)



Ground floor and first floor before and after the restoration | Planta baja y planta primera antes y después de la intervención | Piso térreo e primeiro andar antes e depois da intervenção



enhance the interior sightlines and let sunlight in through to the middle of the ground floor.

- Enhancing intermediate spaces such as porches and pergolas, regarded as transition zones between the interior and exterior.
- Treating the immediate exterior spaces as essential to the project, insofar as a *masía* farmhouse is both architecture and landscape.

In the particular case of Can Fruitós, one of the more challenging tasks was to give views to all of the rooms on the west side. Making large openings in traditional masonry walls often results in abrupt transitions in which the contemporary additions clash with the pre-existing fabric. Thus for us it was vital that the end result be perceived as a balanced ensemble in which our work blended naturally into the whole.

enriquezca las visuales interiores y que facilite la entrada de luz solar hasta el corazón de la planta baja.

- Potenciar los espacios intermedios, como porches y pérgolas, entendidos como zonas de transición entre el interior y el exterior.
- Tratar los espacios exteriores inmediatos como parte esencial del proyecto, en la medida en que la *masía* es, a la vez, arquitectura y paisaje.

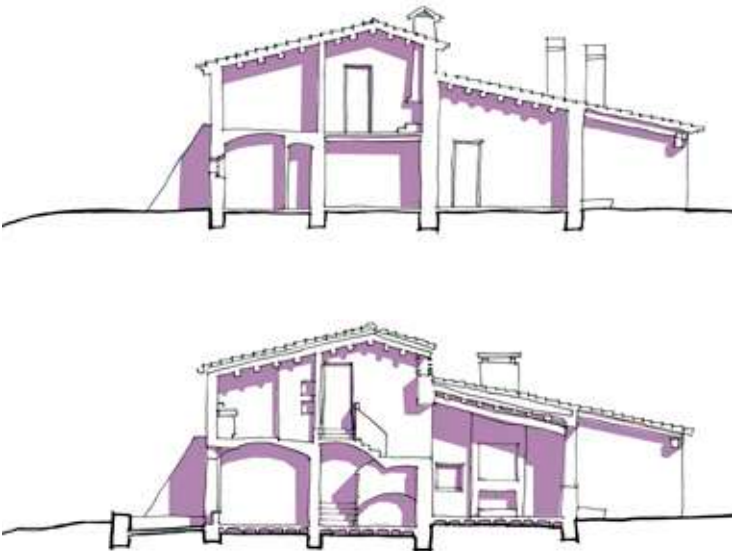
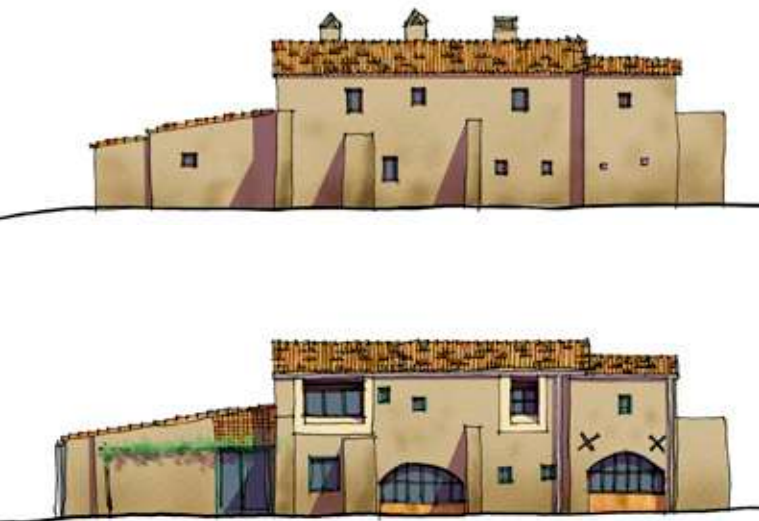
En el caso concreto de Can Fruitós, uno de los retos más complejos fue dotar de vistas a todas las estancias del lado poniente. Abrir grandes huecos en un muro tradicional de mampostería suele resultar en una solución abrupta, donde lo contemporáneo contrasta de forma discordante con las preexistencias. Para nosotros era fundamental que el resultado final se percibiera como un conjunto equilibrado, en el que la intervención se integrara de forma natural en el todo.

enriqueça as vistas interiores e facilite a entrada de luz solar até o coração do piso térreo.

- Valorizar os espaços intermédios, como alpendres e pérgulas, entendidos como zonas de transição entre o interior e o exterior.
- Tratar os espaços exteriores adjacentes como parte essencial do projeto, na medida em que a *masía* é, ao mesmo tempo, arquitetura e paisagem.

No caso específico de Can Fruitós, um dos desafios mais complexos foi proporcionar vistas a todas as divisões do lado oeste. Abrir grandes vãos numa parede tradicional de alvenaria costuma resultar numa solução abrupta, em que o contemporâneo contrasta de forma discordante com o que já existia. Para nós, era fundamental que o resultado final fosse percebido como um conjunto equilibrado, em que a intervenção se integrasse naturalmente no todo.

West elevation and section before and after the restoration | Alzado poniente y sección antes y después de la intervención | Alçado poente e secção antes e depois da intervenção



New rear entrance at the northeast corner | Nuevo acceso posterior en la esquina noreste | Novo acesso posterior no canto nordeste (Antonio Navarro Wijkmark)

Although the pre-licensing phase in 2021 went relatively smoothly, the works lasted for over three years, up to late 2024. This long time for a *masía* of modest size was partly due to the complexity of coordinating the different building trades involved. Over the long process, the client, though pleased with the results, faced a constant dilemma over whether to alter or to preserve the farmhouse's various features.

It is also worth noting that our creative effort went beyond the preliminary design phase. In projects of this sort, changes are constantly needed as the building progressively reveals its structural reality, and clients also normally adjust the original design brief as they experience the results. For this reason the sketches made as work progresses are vital to the final outcome: they are outlines agreed with the craftspeople involved, drawn on site, for the purpose of concretely materializing the architectural solutions.

Aunque la fase previa de tramitación de la licencia se desarrolló con relativa agilidad en 2021, las obras se prolongaron durante tres años, hasta finales de 2024. Tratándose de una *masía* de dimensiones modestas, esta dilación se debió en parte a la complejidad de coordinar los diferentes oficios artesanos. Durante el largo proceso de obra, el cliente, si bien contento con el resultado, se enfrentó al dilema permanente de decidir entre o bien intervenir o bien conservar los distintos elementos de la *masía*.

También es importante destacar que nuestro esfuerzo creativo se extiende más allá de la fase previa de proyecto. En obras de esta naturaleza los cambios son constantes y necesarios, ya que el edificio va revelando progresivamente su realidad constructiva, y el cliente suele también ajustar el proyecto original a medida que experimenta los espacios resultantes. Por este motivo los croquis realizados durante la ejecución adquieren un papel determinante en el resultado final: son esquemas consensuados con los artesanos implicados, elaborados a pie de obra, donde la materialización concreta de las soluciones arquitectónicas se convierte en su verdadera razón de ser.

Embora a fase prévia de tramitação da licença tenha decorrido com relativa agilidade em 2021, as obras prolongaram-se por três anos, até ao final de 2024. Tratando-se de uma *masía* de dimensões modestas, este atraso deveu-se em parte à complexidade de coordenar os diferentes ofícios artesanais. Durante o longo processo de obra, o cliente, embora satisfeito com o resultado, enfrentou o dilema permanente de decidir entre intervir ou preservar os diferentes elementos da quinta.

É importante destacar também que o nosso esforço criativo vai além da fase preliminar do projeto. Em obras desta natureza, as mudanças são constantes e necessárias, pois o edifício vai revelando progressivamente a sua realidade construtiva, e o cliente também costuma fazer ajustes ao projeto original à medida que experiencia os espaços resultantes. Por este motivo, os esboços realizados durante a execução assumem um papel determinante no resultado final: são esquemas consensuais com os artesãos envolvidos, elaborados no local da obra, onde a concretização das soluções arquitetónicas se torna a sua verdadeira razão de ser.

Materials and Installation

Confining ourselves to the use of natural materials has been a constant over our firm’s many projects. On this occasion we again sought to limit the range of materials as far as possible so as to achieve a simple, stylish ambience. On one hand, we used ceramics in their various forms: in flooring, stairs, vaults, sills, and roof tiles. We also used the full range of building arts with lime, in facade renders, interior coatings, plasters, and limewash. As to woodwork, we avoided laminated

Materialización y puesta en obra

Autolimitarnos a utilizar materiales naturales ha sido una constante que ha guiado nuestra trayectoria a lo largo de numerosas intervenciones. En este proyecto, una vez más, nos propusimos reducir al máximo la paleta de materiales empleados, con el fin de garantizar una atmósfera final sobria y elegante. Por un lado, la cerámica se utilizó en todas sus variantes: en pavimentos, escaleras, bóvedas, alféizares y tejas. Del mismo modo, se aprovechó al máximo el amplio repertorio de las artes de la cal, presente en los revoques de fachada,

Materialização e colocação em prática

Limitar-nos a utilizar materiais naturais tem sido uma constante que tem guiado a nossa trajetória ao longo de inúmeras intervenções. Neste projeto, mais uma vez, propusemo-nos reduzir ao máximo a paleta de materiais utilizados, com o objetivo de garantir uma atmosfera final sóbria e elegante. Por um lado, a cerâmica foi utilizada em todas as suas variantes: em pavimentos, escadas, abóbadas, peitoris e telhas. Da mesma forma, aproveitou-se ao máximo o amplo repertório das artes da cal, presente nos rebocos da fachada, revestimentos



< Main entrance and well on the south façade
| Acceso principal y pozo en la fachada sur |
Entrada principal e poço na fachada sul (Antonio Navarro Wijkmark)
>New rear entrance at the northeast corner |
Nuevo acceso posterior en la esquina noreste
| Novo acesso posterior no canto nordeste
(Antonio Navarro Wijkmark)



timber where possible, preferring local solid Douglas fir profiles for furnishings and joinery or new structural pieces. Exposed stone appears selectively in some interior walls and in particular in the exterior dry-stone walling. Finally, pergolas and other metal items were made of solid black-steel profiles coated with stabilized oxide.

revestimientos interiores, estucados y en la pintura de jabelga. En cuanto a la madera, se evitó en lo posible el uso de laminados, priorizando perfiles macizos de Douglas local para la ejecución del mobiliario, las carpinterías y los nuevos elementos estructurales. La piedra vista aparece de manera selectiva en algunos muros interiores, y se emplea especialmente en los muros exteriores de piedra seca. Por último, las pérgolas y demás detalles metálicos se ejecutaron con perfiles macizos de hierro negro con óxido estabilizado.

interiores, estuques e na pintura de cal. Quanto à madeira, evitou-se ao máximo o uso de madeiras laminadas, priorizando os perfis maciços de Douglas local para a execução do mobiliário, caixilharias e novos elementos estruturais. A pedra exposta aparece de forma seletiva em algumas paredes interiores e é usada especialmente nas paredes exteriores de pedra seca. Por último, as pérgolas e outros detalhes metálicos foram executados com perfis maciços de ferro preto com óxido estabilizado.



Old doorway converted into a living room window | Antiguo portal reconvertido en ventanal de la sala de estar | Antigo portal transformado em janela da sala de estar (Antonio Navarro Wijkmark)

The simplicity of these materials has given the resulting spaces a serenity that is in keeping with the folk architecture of these parts. At the same time, the use of inert, little-processed materials allows us to build structures of great durability that age with a characteristic patina and blend naturally with the elements present originally.

Esta sobriedad material ha conferido a los espacios resultantes una serenidad acorde con la arquitectura popular de la comarca. Al mismo tiempo, el uso de materiales inertes y poco procesados permite obtener construcciones de gran durabilidad, que envejecen con una pátina característica y se integran de forma natural con los elementos originales.

Esta sobriedade material conferiu aos espaços resultantes uma serenidade em consonância com a arquitetura popular da região. Ao mesmo tempo, a utilização de materiais inertes e pouco processados permite obter construções de grande durabilidade, que envelhecem com uma pátina característica e se integram naturalmente com os elementos originais.

We determined from the outset that the work would be entrusted to the local company Somnis a Mida and its manager Ariadna Asturias, with whom we have a longstanding relationship. This firm has over ten years' experience in the restoration of traditional architecture and is also a sponsor of the heritage association Projecte GRETA. Working with them ensures that shared practices are applied, such as avoiding synthetic cement, preferring natural materials to industrial ones, and promoting the work of local craftspeople.

Desde el inicio se tuvo claro que las obras estarían a cargo de la empresa local Somnis a Mida y de su gerente, Ariadna Asturias, con quien mantenemos una relación de colaboración consolidada. Se trata de una empresa con más de diez años de experiencia en la recuperación de la arquitectura tradicional, y que además es patrocinadora de la asociación Projecte GRETA. Colaborar con ellos garantiza la aplicación de protocolos compartidos, como la exclusión de cementos sintéticos, la preferencia por el uso de materiales naturales frente a soluciones industrializadas, y la puesta en valor del trabajo de los distintos artesanos locales.

Desde o início, ficou claro que as obras estariam a cargo da empresa local Somnis a Mida e da sua gerente, Ariadna Asturias, com quem mantemos uma relação sólida de colaboração. Trata-se de uma empresa com mais de dez anos de experiência na recuperação da arquitetura tradicional, que também é patrocinadora da associação Projecte GRETA. A colaboração com eles garante a aplicação de protocolos partilhados, como a exclusão de cimentos sintéticos, a preferência pelo uso de materiais naturais em detrimento de soluções industrializadas e a valorização do trabalho dos diferentes artesãos locais.

Catalan Vaulting

If we are known for anything in particular in Girona province it is for our extensive use of this building technique, in both refurbishments and new work. Although we do not normally use structural calculation methods, we ensure that a master artisan is involved where the project conditions so require. In this case, given the complex geometry of the winder stairs and their spiral layout, we called upon the master builder Jordi Domènech, with whom we have worked several times. His presence on site guarantees building rigor and at the same time results in a transmission of knowledge between the various builders involved.

La bóveda catalana

Sipor algo se nos reconoce en las comarcas de Gerona es por la amplia utilización de este sistema constructivo, tanto en obras de rehabilitación como en obra nueva. Pese a prescindir habitualmente de métodos de cálculo estructural, aseguramos la participación de un maestro artesano siempre que las condiciones del proyecto lo requieren. En este caso, debido a la complejidad de la geometría de la escalera compensada y su trazado en espiral, contamos con la colaboración del maestro Jordi Domènech, con quien ya hemos trabajado en varias ocasiones. Su presencia en obra garantiza el rigor constructivo y, al mismo tiempo, favorece la transmisión del conocimiento entre los albañiles implicados.

A abóbada Catalã

Se há algo pelo qual somos reconhecidos nas regiões de Girona é pelo amplo uso deste sistema construtivo, tanto em obras de reabilitação como em obras novas. Apesar de normalmente dispensarmos os métodos de cálculo estrutural, garantimos a participação de um mestre artesão sempre que as condições do projeto assim o exigirem. Neste caso, devido à complexidade da geometria da escada compensada e ao seu desenho em espiral, contamos com a colaboração do mestre Jordi Domènech, com quem já trabalhamos em várias ocasiões. A sua presença na obra garante o rigor construtivo e, ao mesmo tempo, favorece a transmissão de conhecimento entre os pedreiros envolvidos.

Dry Stone

For the construction of the dry-stone wall we had recourse to Xavier Laporta from La Jonquera, a recognized expert in this age-old technique. It was he who

Piedra seca

Para la construcción del muro de piedra seca contamos con la colaboración del maestro Xavier Laporta, de La Jonquera, experto reconocido en esta técnica

Pedra seca

Para a construção do muro de pedra seca, contamos com a colaboração do mestre Xavier Laporta, de La Jonquera, especialista reconhecido nesta técnica

Master builder Jordi Domènech and site manager Faustino Pérez (Somnis a Mida SA) during the construction of the staircase vault | El maestro de obra Jordi Domènech y el jefe de obra Faustino Pérez (Somnis a Mida SA) durante la ejecución de la bóveda de la escalera | O mestre construtor Jordi Domènech e o chefe de obra Faustino Pérez (Somnis a Mida SA) durante a execução da abóbada da escada





1

built the wall connecting the belvedere pavilion with the pergola, for which he used granite stone quarried near Tossa de Mar, characterized by its brownish hue.

ancestral. Fue él quien ejecutó el muro que conecta la casita con vistas con la pérgola, para lo que utilizó una piedra de origen granítico, procedente de un yacimiento cercano a la localidad de Tosa de Mar, caracterizada por su tonalidad parduzca.

ancestral. Foi ele quem construiu o muro que liga a casa com vista com a pérgula, para o qual utilizou uma pedra de origem granítica, proveniente de um jazigo próximo da localidade de Tossa de Mar, caracterizada pela sua tonalidade acastanhada.

Wooden Handrail

Pasamanos de madera

Corrimãos de madeira

We do few projects without the collaboration of our good friend Max Rutgers, a master among master carpenters. In this case his task was to make the complex curving wooden handrail ascending through the spiral stairwell. This precision feature required a high degree of craft skill and gives the staircase a distinctive character. Contributions of this sort add undeniable value to the final outcome.

Son pocas las obras que realizamos sin la colaboración de nuestro buen amigo Max Rutgers, maestro carpintero por excelencia. En este caso su intervención consistió en ejecutar el complejo pasamanos de madera curvado que se desarrolla por el hueco en espiral de la escalera. Esta pieza, de gran precisión técnica, requirió un alto grado de destreza artesanal y confirió a la escalera un carácter singular. Intervenciones de este tipo aportan un valor añadido indiscutible al resultado final.

São poucas as obras que realizamos sem a colaboração do nosso bom amigo Max Rutgers, mestre carpinteiro por excelência. Neste caso, a sua intervenção consistiu em construir o complexo corrimão de madeira curvado que se estende ao longo do vão em espiral da escada. Esta peça, de grande precisão técnica, exigiu um alto grau de habilidade artesanal e conferiu à escada um caráter singular. Intervenções deste tipo conferem um valor acrescentado indiscutível ao resultado final.



2

Wickerwork

Cestería

Cestaria

The art of wickerwork has long been regarded as a poor relation among building crafts, but in our firm we have always attached high value to it. Here again, together with Josep and Magda de Torroella, we were able to enrich the project with several details. Accessible ceilings made of cane and lightshades woven in wicker are just two examples of how the sensibility of local craftspeople can be naturally integrated into architecture.

El arte de la cestería ha sido tradicionalmente considerado la hermana menor de las técnicas constructivas, pero en nuestro estudio siempre le hemos otorgado un valor esencial. Una vez más, de la mano de Josep y Magda de Torroella, pudimos enriquecer la obra con varios detalles. Cielos rasos registrables realizados en caña y pantallas de luminarias tejidas en mimbre son solo dos ejemplos que reflejan cómo la sensibilidad de los artesanos locales puede integrarse con naturalidad en la arquitectura.

A arte da cestaria tem sido tradicionalmente considerada a irmã mais nova das técnicas de construção, mas no nosso estúdio sempre lhe atribuímos um valor essencial. Mais uma vez, com a ajuda de Josep e Magda de Torroella, pudemos enriquecer a obra com vários detalhes. Tetos falsos registáveis feitos de cana e abajures tecidos em vime são apenas dois exemplos que refletem como a sensibilidade dos artesãos locais pode integrar-se naturalmente na arquitetura.



3

< 1: Dry stone master builder Xavier Laporta during the construction of the wall 2: Workshop of master carpenter Max Rutgers during the making of the curved stair railing and its final installation 3: Josep and Magda from Tramats in Torroella de Montgrí during the installation of the elements and light fixtures made with plant fibers | 1: El maestro de construcción en piedra seca, Xavier Laporta, durante la ejecución del muro 2: Taller del maestro carpintero Max Rutgers durante la elaboración de la barandilla curva de la escalera y su emplazamiento final 3: Josep y Magda, de Tramats, en Torroella de Montgrí durante la colocación de las piezas y las luminarias realizadas con fibras vegetales | 1: O mestre de construção em pedra seca, Xavier Laporta, durante a execução do muro 2: Oficina do mestre carpinteiro Max Rutgers durante a elaboração do corrimão curvo da escada e a sua colocação final 3: Josep e Magda da Tramats em Torroella de Montgrí durante a colocação das peças e luminárias feitas com fibras vegetais

A Pavilion with Views

On the north side of the property, where some disused stables were to be rehabilitated, the opportunity arose to design a small room with an ensuite bathroom. Despite its modest size, this annexed volume for guests accounted for a large part of our design efforts. With the adjoining meadow, the pergola, and the dry-stone wall, the pavilion became an example of the type of country retreat known as *lujo campestre*: a room with views along with a garden created as a pleasant belvedere over Les Gavarres—an unusual refuge, and value added to the property overall.

Una pequeña casa con vistas

En el extremo norte de la finca, y con la intención de rehabilitar unas antiguas caballerizas en desuso, se nos presentó la oportunidad de diseñar una pequeña habitación equipada con baño. A pesar de sus dimensiones modestas, este volumen anexo destinado a invitados concentró una parte significativa de nuestros esfuerzos de diseño. Gracias al prado contiguo, la pérgola y el muro de piedra seca, este rincón se ha convertido en un claro ejemplo de lo que entendemos por “lujo campestre”. Una habitación con vistas, acompañada de un jardín, que se ha erigido en un placentero mirador de Las Gavarres, y que aporta un singular espacio de cobijo y un valor añadido al conjunto de la finca.

Uma pequena casa com vista

No extremo norte da propriedade, com a intenção de reabilitar as antigas cavalariças em desuso, surgiu a oportunidade de projetar um pequeno quarto equipado com casa de banho. Apesar das suas dimensões modestas, este anexo destinado aos hóspedes concentrou uma parte significativa dos nossos esforços de design. Graças ao prado adjacente, à pérgula e ao muro de pedra seca, este recanto tornou-se um claro exemplo do que entendemos por «luxo campestre». Um quarto com vista, acompanhado por um jardim, que se tornou um agradável miradouro de Les Gavarres e que proporciona um espaço único de refúgio e um valor acrescentado ao conjunto da propriedade.

Thin-tile vaulted staircase coated with lime plaster and with handmade ceramic steps | Escalera de bóveda tabicada revocada con cal y con peldaños de cerámica artesanal | Escada de abóbada de tijolo revestida com cal e com degraus de cerâmica artesanal (Antonio Navarro Wijkmark)



Project Overview

As may be seen, the main alterations were in the interior spaces. Walls were removed and apertures made to achieve the desired fluidity between the living room, dining room, and kitchen. The openings in the west facade were also greatly widened, allowing one to look out to the countryside.

On the upper floor the new stairs have become the house’s center of gravity, giving harmonious access to the two suites and providing a spacious connection between the two stories. The two suites revolve around the bathroom area in the middle and have westerly views through large windows. The southern facade, the most characteristic

Descripción del conjunto

Como puede apreciarse, la transformación más significativa se ha concentrado en los espacios interiores. Se eliminaron muros y se abrieron nuevos pasos interiores con el objetivo de lograr la fluidez deseada entre la sala, el comedor y la cocina. Asimismo, se ampliaron de forma notable las aberturas en la fachada poniente para favorecer el disfrute del paisaje.

En la planta superior la nueva escalera se convierte en el centro de gravedad de la vivienda. Esta escalera no sólo garantiza un acceso armonioso a las dos suites, sino que establece una conexión generosa entre ambas plantas. Las dos suites concentran la zona de baños en el núcleo central y se abren hacia las vistas

Descrição do conjunto

Como se pode observar, a transformação mais significativa concentrou-se nos espaços interiores. Foram eliminadas paredes e abertas novas passagens interiores com o objetivo de alcançar a fluidez desejada entre a sala, a sala de jantar e a cozinha. Além disso, as aberturas na fachada oeste foram notavelmente ampliadas para favorecer a apreciação da paisagem.

No piso superior, a nova escada torna-se o centro de gravidade da casa, garantindo não só um acesso harmonioso às duas suites, mas também estabelecendo uma ligação generosa entre os dois pisos. As duas suites concentram a zona das casas de banho no núcleo central e

Guest bedroom with westward views and stair landing serving as the entrance hall to the main bedroom | Dormitorio de invitados con vistas a poniente y rellano de la escalera que sirve como vestíbulo del dormitorio principal | Quarto de hóspedes com vista para o poente e patamar da escada que serve de vestíbulo para o quarto principal (Antonio Navarro Wijkmark)





Bathroom and dressing room of the main bedroom
| Baño y vestidor del dormitorio principal | Casa
de banho e vestiário do quarto principal (Antonio
Navarro Wijkmark)

one of the ensemble, was less altered. An unsuitable balcony was removed and a large gateway restored, as existed originally according to a photo from the 1960s.

The requirement to optimize the vistas toward Les Gavarres involved the most significant alterations in the west facade. This westerly elevation had only small openings, insufficient for the desired visual connection between interior and exterior. Yet the elevation resulting from the new apertures, drawing on the repertoire of local vernacular architecture and executed with strictly natural materials, blends naturally with the ensemble.

The creation of a new entrance on the north side involved a controlled fracturing of the volume, connecting the east and west facades. All the original chimneys, which had excessive visual impact, were replaced with a single

del poniente mediante grandes aberturas. La fachada sur, la más representativa del conjunto, es la que ha experimentado menos transformaciones. En ella se eliminó un balcón fuera de contexto y se recuperó un gran portal, tal como existía originalmente, según una fotografía de los años sesenta.

El requerimiento de maximizar las vistas hacia Las Gavarres supuso la transformación más significativa en la fachada oeste. El alzado poniente presentaba unas aberturas modestas que dificultaban la deseada relación visual entre interior y exterior. Aun así, al tratarse de nuevas aberturas inspiradas en el repertorio de la arquitectura vernácula local y ejecutadas con materiales estrictamente naturales, el alzado resultante se integra con naturalidad en el conjunto.

La creación de un nuevo acceso en el lado norte supone una fractura controlada

abrem-se para as vistas a oeste através de grandes aberturas. A fachada sul, a mais representativa do conjunto, é a que sofreu menos transformações. Nela, foi eliminada uma varanda fora de contexto e recuperado um pórtico, tal como existia originalmente, de acordo com uma fotografia dos anos sessenta.

A necessidade de maximizar as vistas para Les Gavarres implicou uma transformação mais significativa na fachada oeste. A elevação oeste apresentava aberturas modestas que dificultavam a relação visual desejada entre o interior e o exterior. Ainda assim, por se tratar de novas aberturas inspiradas no repertório da arquitetura vernacular local e executadas com materiais estritamente naturais, a fachada resultante integra-se naturalmente no conjunto.

A criação de um novo acesso no lado norte implica uma fratura controlada do volume, que permite conectar as fachadas

chimney, which takes on a symbolic character and has become a landmark beyond its utilitarian function.

In the central bay, corresponding to the hall area, the original space had unduly low headroom, with dark joists and walls with a stippled finish and ceramic skirting completing an unappealing picture. To enhance the entrance, the flooring was lowered by 50 cm, winder stairs were fitted with Catalan timbrel vaulting, connecting to both the living room and the upper floor, and finally the area was plastered with pigmented air-lime render.

del volumen, que permite conectar las fachadas de levante y poniente. Se eliminaron todas las chimeneas originales, cuyo impacto visual resultaba excesivo, para dar protagonismo a una única chimenea. Esta adquiere un carácter simbólico y se convierte en un hito paisajístico, más allá de su función estrictamente utilitaria.

En la crujía central, correspondiente a la zona de vestíbulo, el espacio original presentaba una altura libre bajo viga excesivamente reducida. Un forjado con vigas oscuras y unas paredes tratadas con gotelé y zócalo cerámico completaban un espacio de escaso atractivo. Para dignificar este acceso se rebajó el pavimento 50 cm, se emplazó una escalera compensada ejecutada con bóveda catalana, conectada tanto con la sala de estar como con la planta superior, y, finalmente, se enlució el conjunto con un revoco de cal aérea pigmentada.

leste e oeste. Todas as chaminés originais, cujo impacto visual era excessivo, foram eliminadas para dar destaque a uma única chaminé. Esta adquire um caráter simbólico e torna-se um marco paisagístico, para além da sua função estritamente utilitária.

Na ala central, correspondente à zona do vestíbulo, o espaço original apresentava uma altura livre que era excessivamente reduzida. Um forjado com vigas escuras e paredes tratadas com gotelé e rodapé cerâmico completavam um espaço pouco atraente. Para dignificar este acesso, o pavimento foi rebaixado 50 cm, foi colocada uma escada compensada executada com uma abóbada Catalã, ligada tanto à sala como ao piso superior e, finalmente, foi aplicado ao conjunto um reboco com cal aérea pigmentada.

Living room with fireplace on the north side and large window on the south façade | Sala de estar con el hogar en el lado norte y ventanal en la fachada sur | Sala de estar com lareira no lado norte e grande janela na fachada sul (Antonio Navarro Wijkmark)



The large living room is the product of the demolition of an interior wall. Twin local Douglas fir beams support the two ceilings, resulting in an airy space wholly different from how it was before. The combination of plaster and lime paint also contributes to the sense of spaciousness.

The interior openings allow inviting spatial connections to be made between the various bays, achieving the desired fluidity without disrupting the existing structural layout. On the middle wall we combined lime plaster and exposed masonry in equal proportions, meeting the client’s wish for bare stone to be on view while also providing the visual comfort offered by lime render.

As is traditional, a great hearth presides over the north facade of the living room, in this case conceived as a tribute to the local ceramics historically characterizing the district of Baix Empordà. We used

La gran sala de estar resultante es fruto del derribo del muro interior original. Una doble jácena de madera de Douglas local sostiene las dos cubiertas y permite disfrutar de un espacio diáfano, inexistente en el estado previo. La combinación del revoco con la pintura de cal refuerza aún más la sensación de amplitud conseguida.

Las aberturas interiores permiten establecer conexiones espaciales sugerentes entre las distintas crujías, que logran así la fluidez deseada sin alterar el esquema estructural preexistente. En el muro central se ha combinado, a partes iguales, el estuco de cal con zonas de mampostería vista. Esta solución permite, por un lado, satisfacer el deseo del cliente de apreciar la piedra desnuda, y por otro, incorporar el confort visual que aportan los revocos de cal.

Como es tradición, un gran hogar preside la fachada norte de la sala de

A grande sala de estar resultante é fruto da demolição da parede interior original. Uma viga dupla de madeira Douglas local sustenta os dois telhados e permite desfrutar de um espaço diáfano, inexistente anteriormente. A combinação do reboco com a pintura de cal reforça ainda mais a sensação de amplitude alcançada.

As aberturas interiores permitem estabelecer ligações espaciais sugestivas entre os diferentes corredores, conseguindo assim a fluidez desejada sem alterar o esquema estrutural pré-existente. Na parede central, combinou-se, em partes iguais, o reboco de cal com zonas de alvenaria exposta. Esta solução permite, por um lado, satisfazer o desejo do cliente de apreciar a pedra nua e, por outro, incorporar o conforto visual proporcionado pelos rebocos de cal.

Como é tradição, uma grande lareira preside a fachada norte da sala, neste

Kitchen and dining room connected through the new structural arch | Cocina y comedor conectados gracias al nuevo arco de apeo | Cozinha e sala de jantar ligadas através do novo arco de sustentação (Antonio Navarro Wijkmark)



Visual connection between the living room and the kitchen | Relación visual entre la sala de estar y la cocina | Relação visual entre a sala de estar e a cozinha (Antonio Navarro Wijkmark)

ceramics with marked texture and pleasantly aged hues, providing a subtle contrast with the plastered walls and limewashed roofing. This is an ideal spot for enjoying the warmth of the fireside, either as a retreat for solitary contemplation or as a meeting place in which to share a winter evening with friends.

The wall separating the kitchen from the dining room was removed and the space was shored with a timbrel-vault arch. The ceiling woodwork was sandblasted and primed with oil so as to give the ambiance greater warmth in keeping with the character required for the dining area.

estar, en este caso concebido como un homenaje a la cerámica local que ha caracterizado históricamente la comarca del Bajo Ampurdán. Se ha utilizado cerámica de textura marcada y agradable destonificación, que aporta un contraste sutil frente a los muros estucados y la cubierta enjalbegada. Se trata de un escenario ideal para disfrutar del calor del fuego, ya sea como espacio de recogimiento y reflexión en solitud, o como lugar de encuentro para compartir una tarde de invierno entre amigos.

La eliminación del muro que separaba la cocina del comedor se resolvió mediante un apeo formado por un arco ejecutado con bóveda tabicada. Los forjados fueron decapados mediante arenado e imprimados con aceite, con el objetivo de aportar mayor calidez al ambiente, en consonancia con el carácter que requiere el espacio del comedor.

caso concebida como una homenagem à cerâmica local que caracterizou historicamente a região do Baix Empordà. Foi utilizada cerâmica com uma textura acentuada e uma agradável destonificação, que proporciona um contraste subtil face às paredes estucadas e ao telhado caiado. Trata-se de um cenário ideal para desfrutar do calor do fogo, seja como espaço de recolhimento e reflexão em solidão, seja como local de encontro para partilhar uma tarde de inverno entre amigos.

A eliminação da parede que separava a cozinha da sala de jantar foi resolvida através de um arco executado com uma abóbada Catalã. Os forjados foram decapados com jato de areia e impregnados com óleo, com o objetivo de conferir maior aconchego ao ambiente, em consonância com o caráter que o espaço da sala de jantar exige.



Visual connection between the entrance hall, the living room, and the porch at the northeast corner | Relación visual del vestíbulo, la sala de estar y el porche en la esquina noreste | Relação visual entre o vestíbulo, a sala de estar e o alpendre no canto nordeste (Antonio Navarro Wijkmark)

The winder staircase acts as a real center of gravity for the whole farmhouse. The stairwell connects the main suite visually with the large living room and, at the same time, lets overhead light through to the ground floor, enhancing the spatial continuity. The suite is partitioned from the stairwell by a traditional timber frame with wattle-and-daub filling. This is a style taken from Japanese vernacular tradition that we have used in previous projects.

Finally one reaches the main suite, which has an optimal visual connection with the rest of the house and remarkable views, without sacrificing privacy. The dressing room, shower, bathroom, and rest area are divided in a way that does not interfere with a fluid, unitary apprehension of the whole space.

The little stable was turned into a suite with views. Here one readily sees an allusion to the nineteenth-century cabin of H. D. Thoreau. A view of luxury conceived as relinquishing the superfluous: a certain asceticism to release us from the bondage of urban life. A cabin, a dry-stone wall, a tree, and a pergola: the essential elements for generating habitability in dialogue with

La escalera compensada actúa como el verdadero centro de gravedad de toda la masía. Conecta visualmente la suite principal con la gran sala de estar y, al mismo tiempo, facilita el paso de la luz cenital hacia la planta baja, lo que refuerza la continuidad espacial. La separación entre la suite y la escalera se resuelve mediante un entramado tradicional de madera, con macizados ejecutados a base de barro y entramado. Se trata de un recurso tomado de la tradición vernácula japonesa, que ya hemos empleado en intervenciones anteriores.

Finalmente, se accede a la suite principal, que goza de una óptima relación visual con el resto de la vivienda y de unas vistas privilegiadas, sin renunciar por ello a la privacidad. La división entre vestidor, ducha, aseo y zona de descanso se ha resuelto de manera que no interfiere con una lectura fluida y unitaria del conjunto del espacio.

El pequeño cobertizo para caballos se ha transformado en una suite con vistas. Es fácil reconocer en esta propuesta la referencia a la cabaña decimonónica de H. D. Thoreau. Una interpretación del lujo entendida como renuncia a lo superfluo: un cierto ascetismo que libera

A escada compensada funciona como o verdadeiro centro de gravidade de toda a masía. Ela conecta visualmente a suite principal com a grande sala de estar e, ao mesmo tempo, facilita a passagem da luz zenital para o piso térreo, o que reforça a continuidade espacial. A separação entre a suite e a escada é resolvida através de enxaimel com enchimentos executados em barro e entramado. Trata-se de um recurso tirado da tradição vernacular japonesa, que já utilizamos em intervenções anteriores.

Finalmente, chegamos à suite principal, que goza de uma excelente relação visual com o resto da casa e de vistas privilegiadas, sem renunciar à privacidade. A divisão entre o vestiário, o chuveiro, o casa de banho e a área de descanso foi resolvida de forma a não interferir com uma leitura fluida e unitária do conjunto do espaço.

O pequeno galpão para cavalos foi transformado numa suite com vista. É fácil reconhecer nesta proposta a referência à cabana do século XIX de H. D. Thoreau. Uma interpretação do luxo entendida como renúncia ao supérfluo: um certo ascetismo que liberta da escravidão da vida urbana. Uma cabana,

the landscape. A lesson learned from the remarkable vernacular architecture of the Mediterranean, where comfort is also provided for outdoors.

Despite having built a second wall layer according to the British cavity-wall tradition (Roselló 2022), we were required to fit a climate control system. The ventilation grille was modeled on the classic *espiere* vents found in the *masías* of Les Gavarres (Danés i Torras

de la esclavitud de la vida urbana. Una cabaña, un muro de piedra seca, un árbol y una pérgola: los elementos esenciales para generar habitabilidad en diálogo con el paisaje. Se trata de una lección aprendida de la excepcional arquitectura vernácula del Mediterráneo, donde el confort también se construye en los espacios exteriores.

A pesar de haber ejecutado un doble cerramiento según la tradición británica

um muro de pedra solta, uma árvore e uma pérgula: os elementos essenciais para gerar habitabilidade em diálogo com a paisagem. Uma lição aprendida com a excepcional arquitetura vernacular do Mediterrâneo, onde o conforto também é construído nos espaços exteriores.

Apesar de termos executado um duplo revestimento de acordo com a tradição britânica da *cavity wall* (Roselló 2022), fomos obrigados a instalar um sistema de

Condition before (1) and after (2, 3) the restoration in the guest suite | Estado previo (1) y posterior (2, 3) a la intervención en la suite de invitados | Estado anterior (1) e posterior (2, 3) à intervenção na suite de hóspedes (2, 3: Antonio Navarro Wijkmark)





Interior of the guest suite featuring a traditional opening that functions as an air-conditioning diffuser | Interior de la suite de invitados con una apertura tradicional que funciona como difusor del aire acondicionado | Interior da suite de hóspedes com uma abertura tradicional que funciona como difusor do ar-condicionado (Antonio Navarro Wijkmark)

2010). Any technical requirement may thus become an opportunity to reuse details from a rich local building repertoire.

del *cavity wall* (Roselló 2022), nos vimos obligados a instalar un sistema de climatización. La rejilla de impulsión del aire tratado se resolvió siguiendo el modelo de las clásicas *espieres* que se encuentran en las escaleras de las masías de Las Gavarres (Danés i Torras 2010). Toda necesidad técnica se convierte así en una oportunidad para recuperar elementos del amplio repertorio constructivo local.

Conclusion

In this project we had an exceptional chance to demonstrate the virtues of the use of traditional techniques. The client has seen his initial dream materialized and now enjoys a new Can Fruitós that has lost none of its original essence. There is no better sign of a satisfactory project outcome than a bond of friendship being forged between the client, technicians, and artisans.

I like to think that this type of refurbishment, with close involvement of craftspeople, priority given to local raw materials, and use of the traditional techniques of local vernacular architecture, is not an unrepeatable experience. I am convinced that in



climatização. A grelha de impulsão do ar tratado foi resolvida seguindo o modelo das clássicas *espieres* que se encontram nas escadas das *masías* de Les Gavarres (Danés e Torras, 2010). Qualquer necessidade técnica torna-se assim uma oportunidade para recuperar elementos do amplo repertório construtivo local.

Conclusão

Neste projeto, tivemos a oportunidade excepcional de ilustrar as virtudes do uso de técnicas tradicionais. O cliente conseguiu concretizar o seu sonho inicial e hoje desfruta de um novo Can Fruitós sem ter perdido a essência original. Não há melhor indicador do sucesso de uma obra do que o vínculo de amizade forjado entre o cliente, os técnicos e os artesãos envolvidos.

Gosto de pensar que este tipo de intervenção, com uma elevada implicação dos artesãos, a utilização prioritária de matérias-primas locais e a aplicação de técnicas tradicionais próprias da arquitetura vernacular do local, não constitui uma experiência isolada. Estou

the current context of climate crisis, labor market transformation, and an increasing need for individual authenticity and integrity, this model can be transposed to other projects.

I would not like to end without expressing my most sincere thanks to the client for his trust and confidence, to the building firm for its patience and competence, and above all to the generous artisans who were at the creative heart of the project from its outset.

aislada. Estoy convencido de que, en el contexto actual de emergencia climática, transformación del mundo laboral y necesidad creciente de autenticidad e integridad por parte del individuo, este modelo es plenamente extrapolable a otros proyectos.

No quisiera concluir sin expresar mi más sincero agradecimiento al cliente por su confianza, a la constructora por su paciencia y competencia, y, por encima de todo, a los generosos artesanos que han formado parte del núcleo creativo desde las fases iniciales del proyecto.

convencido de que, no contexto atual de emergência climática, transformação do mundo do trabalho e necessidade crescente de autenticidade e integridade por parte do indivíduo, este modelo é plenamente extrapolável para outros projetos.

Não gostaria de terminar sem expressar o meu sincero agradecimento ao cliente pela sua confiança, à empresa construtora pela sua paciência e sua competência e, acima de tudo, aos generosos artesãos que fizeram parte do núcleo criativo desde as fases iniciais do projeto.

References | Referencias | Referências

Camps i Arboix, Josep. 1959. *La Masia Catalana. Historia – Arquitectura – Sociologia*. Barcelona: Editorial Aedos.

Moner, Jordi; y Puigvert, Joaquim M. 2010. *Materials per l'estudi de la Masia de Josep Danés i Torras*. Girona: Associació d'Història Rural de les Comarques Gironines de la Universitat de Girona.

Roselló, Oriol. 2022. Cavity Wall: ejemplo de cerramiento tradicional actualizado. Un sistema constructivo de doble envolvente. *EcoHabitat*, 75.

Danés i Torras, Josep. 2010. *Materials per l'estudi de la Masia*. Girona: Documenta Universitaria.

Biography | Biografia | Biografia

Oriol Roselló Viñas

Oriol has worked as an architect for the last 30 years, with over 200 projects performed in Catalonia. His career has involved extensive observation of anonymous architecture, documented through many photographic expeditions around the world. He has led cooperation projects in Bangolo (Ivory Coast), where he worked with local materials and techniques alongside Ivorian artisans. As a professor at the University of Girona, he founded the CATS (Construction: Advanced Technologies and Sustainability) research group. He cofounded the GRETA heritage project and directs a master's program in traditional techniques. In 2014 he received the first EcoViure Award for a cob building, and in 2019 the first Toni Cobos Award for Traditional Architecture. In August of the same year he led a seminar on "Sustainable architecture, technology and tradition" at the University of Córdoba (Argentina). He has also led the Catalan technical workshops on "Traditional techniques in the construction of contemporary architecture", being held for the fourth time in 2025.

Ha trabajado como arquitecto durante los últimos 30 años, con más de 200 obras en Cataluña. Su trayectoria incluye una intensa labor de observación de la arquitectura anónima, documentada a través de numerosas expediciones fotográficas alrededor del mundo. Ha dirigido proyectos de cooperación en Bangolo (Costa de Marfil), donde ha trabajado con materiales y técnicas locales junto a artesanos del lugar. Como profesor en la Universitat de Girona fundó el grupo de investigación CATS (Construcción: Tecnologías Avanzadas y Sostenibilidad). Es cofundador del proyecto GRETA y director del curso de maestría en técnicas tradicionales. En 2014 recibió el primer premio EcoViure por un edificio de *cob* y, en 2019, el primer premio Toni Cobos de Arquitectura Tradicional. En agosto de ese mismo año dirigió el seminario "Arquitectura sustentable, tecnología y tradición" en la Universidad de Córdoba (Argentina). Ha dirigido igualmente las jornadas técnicas "Les tècniques tradicionals en la construcció de l'arquitectura contemporània" que en 2025 llegan a su cuarta edición.

Trabalhou como arquiteto durante os últimos 30 anos, com mais de 200 obras na Catalunha. A sua trajetória inclui um intenso trabalho de observação da arquitetura anónima, documentado através de numerosas expedições fotográficas pelo mundo. Dirigiu projetos de cooperação em Bangolo (Costa do Marfim), onde trabalhou com materiais e técnicas locais juntamente com os artesãos locais. Como professor na Universidade de Girona, fundou o grupo de investigação CATS (Construção: Tecnologias Avançadas e Sustentabilidade). É cofundador do projeto GRETA e diretor do curso de mestria em técnicas tradicionais. Em 2014, recebeu o primeiro prémio EcoViure por um edifício de cobe, em 2019, o primeiro prémio Toni Cobos de Arquitetura Tradicional. Em agosto do mesmo ano, dirigiu o seminário «Arquitetura sustentável, tecnologia e tradição» na Universidade de Córdoba (Argentina). Dirigiu igualmente as jornadas técnicas «Les tècniques tradicionals en la construcció de l'arquitectura contemporània» (As técnicas tradicionais na construção da arquitetura contemporânea), que em 2025 chegarão à sua quarta edição.



Mosul's Heritage Restored: The Story of Al-Tahera Church

Restauración del patrimonio de Mosul: La historia de la iglesia de al-Tahira

Restauração do património de Mossul: A história da igreja Al-Tahera

Anas Zeyad
Abdulmalek, Ali
Salem Al-Khatabi

Location and Context

Al-Tahera Church is located in the Old City of Mosul in an area historically known as Hosh Al-Baiea, or “courtyard of churches.” This district contains four other historic churches—Armenian, Orthodox, and, in two other cases, Syriac Catholic—along with a primary school, the bishop’s house, and two major mosques: Nabi Jirjis and Abdulrahman bin Awf. Together, these structures form a unique cluster of significant buildings within a dense network of narrow alleys and courtyard houses, reflecting centuries of shared life among Mosul’s diverse communities and forming a symbolically important part of the city’s historic core.

Situación y contexto

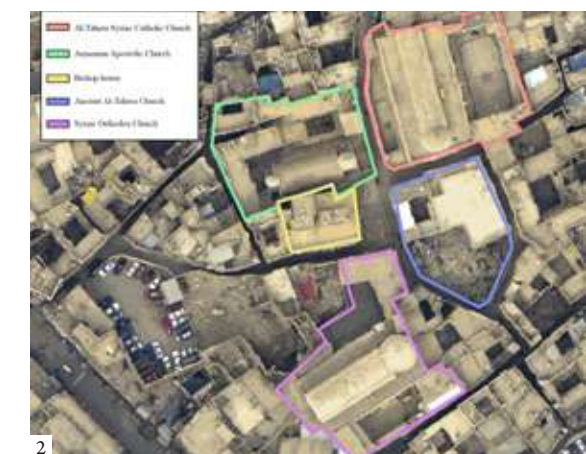
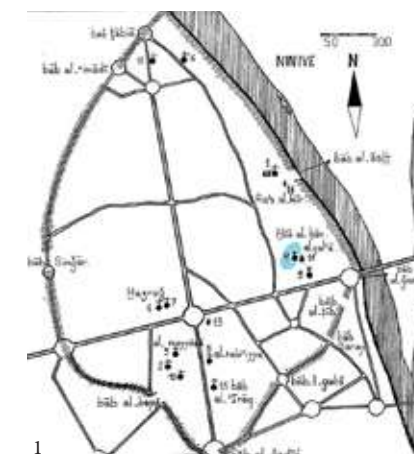
La iglesia de al-Tahira se encuentra en la Ciudad Antigua de Mosul, en una zona conocida tradicionalmente como Hosh al-Baiea (patio de las iglesias). En este barrio hay otras cuatro iglesias históricas: la armenia, la ortodoxa y otras dos católicas siríacas, además de una escuela primaria, la casa del obispo y dos grandes mezquitas, la de Nabi Jirjis y la de Abdulrahman bin Awf. Estas estructuras forman un conjunto único de edificios importantes en medio de una densa red de callejuelas y casas con patio que reflejan siglos de convivencia entre las diversas comunidades de Mosul y constituyen una parte del centro histórico de la ciudad con una gran carga simbólica.

Localização e contexto

A Igreja Al-Tahera está localizada na Centro Histórico de Mossul, numa área historicamente conhecida como Hosh Al-Baiea, ou «pátio das igrejas». Este bairro contém outras quatro igrejas históricas — Arménia, Ortodoxa e duas Católicas Siríacas — juntamente com uma escola primária, a casa do bispo e duas mesquitas importantes: Nabi Jirjis e Abdulrahman bin Awf. Juntas, estas estruturas formam um conjunto único de edifícios significativos dentro de uma densa rede de vielas estreitas e casas com pátios, refletindo séculos de vida partilhada entre as diversas comunidades de Mossul e formando uma parte simbolicamente importante do centro histórico da cidade.

< Main dome and altar | Cúpula principal y altar |
Cúpula principal e altar (Abdullah Rashid)

> 1: Map of churches in Mosul during the Ottoman period 2: Aerial view of Hosh al-Baiea, Old City of Mosul, Iraq | 1: Mapa de las iglesias de Mosul durante el período otomano 2: Vista aérea de Hosh al-Baiea, Ciudad Vieja de Mosul, Irak | 1: Mapa das igrejas de Mossul durante o período otomano 2: Vista aérea de Hosh al-Baiea, Cidade Antiga de Mossul, Iraque (1: Mérioux 1983 2: Google Earth)



Church Design

Architecturally, Al-Tahera follows a traditional basilica layout, with a vaulted nave rising above two vaulted aisles, leading to an apse. The interior features multiple altars, Romanesque-style arches, and distinctive alabaster cladding characteristic of the Mosul region. Two sacristy rooms flank the main space, and an annex originally accommodated a library and classrooms, reflecting the church’s dual spiritual and educational role. Its design was strongly influenced by the city’s climate. In hot summers and cold winters, the 180 cm-thick limestone masonry walls, vaulted ceilings, and alabaster interior cladding regulate temperature and light naturally. This integration of climate-responsive design, craftsmanship, and spiritual symbolism established Al-Tahera as a landmark of Christian heritage in Mosul.

El proyecto de la iglesia

Desde el punto de vista arquitectónico, al-Tahira sigue la disposición tradicional de una basílica, con una nave abovedada que se eleva sobre las dos naves laterales abovedadas y conduce al ábside. El interior cuenta con numerosos altares, arcos de estilo románico, y se caracteriza por su revestimiento de alabastro típico de la región de Mosul. Dos sacristías flanquean el espacio principal y un anexo albergaba originalmente una biblioteca y varias aulas, reflejo de la doble función espiritual y educativa de la iglesia. Su diseño estuvo muy influido por el clima de la ciudad. Con calurosos veranos y fríos inviernos, los muros de mampostería de caliza de 180 cm de espesor, los techos abovedados y el revestimiento interior de alabastro regulan la temperatura y la luz de una manera natural. La integración de un diseño acorde con el clima, la artesanía y el simbolismo espiritual convirtió a la iglesia de al-Tahira en un referente de la herencia cristiana de Mosul.

Design da igreja

Em termos arquitetónicos, Al-Tahera segue um design tradicional de basílica, com uma nave abobadada elevando-se acima de duas naves laterais abobadadas, conduzindo a uma abside. O interior apresenta vários altares, arcos em estilo românico e revestimento de alabastro característico da região de Mossul. Duas sacristias ladeiam o espaço principal, e um anexo que originalmente acomodava uma biblioteca e salas de aula, refletindo o duplo papel espiritual e educacional da igreja. O seu design foi fortemente influenciado pelo clima da cidade. Nos verões quentes e invernos frios, as paredes de pedra calcária com 180 cm de espessura, os tetos abobadados e o revestimento interior de alabastro regulam a temperatura e a luz naturalmente. Esta integração de design sensível ao clima, artesanato e simbolismo espiritual definiu Al-Tahera como um marco do património cristão em Mossul.

Initial Conditions and Objectives

By 2017, Al-Tahera Church, used by ISIS as a court of law, was in ruins. Airstrikes had destroyed nearly 85 percent of the building, including the main domes and most of the roofs, fracturing and displacing walls and causing widespread collapse. The interior was filled with debris, explosives, and even human remains, with only two of the original twelve columns left intact. The main altar had also collapsed, and one of the two sacristy rooms was wholly destroyed. Initial attempts were made to demolish the remaining structure entirely and rebuild the church from scratch, which would have resulted in the loss of its original stones and heritage value.

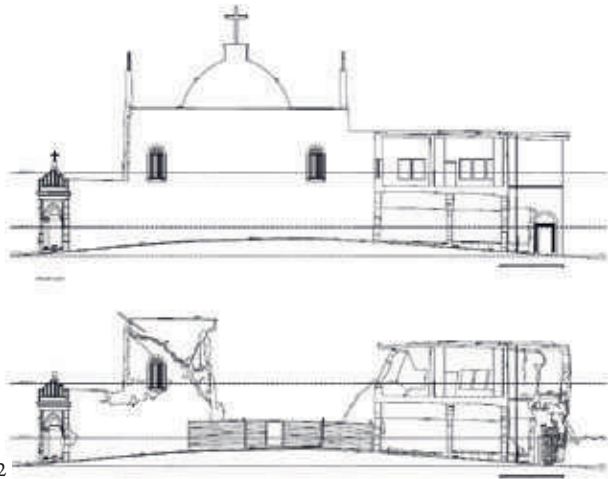
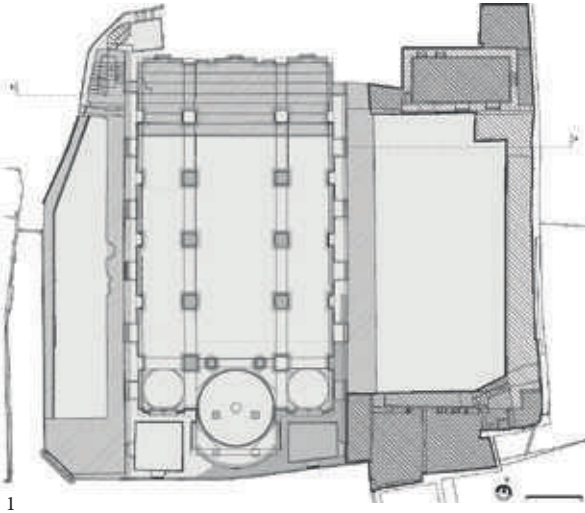
Condiciones iniciales y objetivos

En 2017, la iglesia de al-Tahira, que el Estado Islámico había utilizado como tribunal de justicia, estaba en ruinas. Los bombardeos habían destruido casi el 85% del edificio, incluidas las cúpulas principales y la mayoría de la cubierta, fracturando y desplazando los muros y provocando un derrumbamiento prácticamente total. El interior estaba lleno de escombros, explosivos e incluso restos humanos, y tan solo dos de las doce columnas originales habían quedado intactas. El altar mayor también se había desplomado y una de las sacristías estaba completamente destruida. Se hizo un primer intento para demoler toda la estructura que había quedado en pie y reconstruir la iglesia desde cero, con lo que ésta habrían perdido las piedras originales y su valor histórico.

Condições iniciais e objetivos

Em 2017, a Igreja Al-Tahera, usada pelo ISIS como tribunal, estava em ruínas. Os ataques aéreos destruíram quase 85% do edifício, incluindo as cúpulas principais e a maior parte dos telhados, fraturando e deslocando paredes e causando um colapso generalizado. O interior estava cheio de escombros, explosivos e até restos humanos, com apenas duas das doze colunas originais intactas. O altar principal também tinha desabado e uma das duas sacristias estava totalmente destruída. Foram feitas tentativas iniciais para demolir totalmente a estrutura restante e reconstruir a igreja do zero, o que teria resultado na perda das suas pedras originais e do seu valor patrimonial.

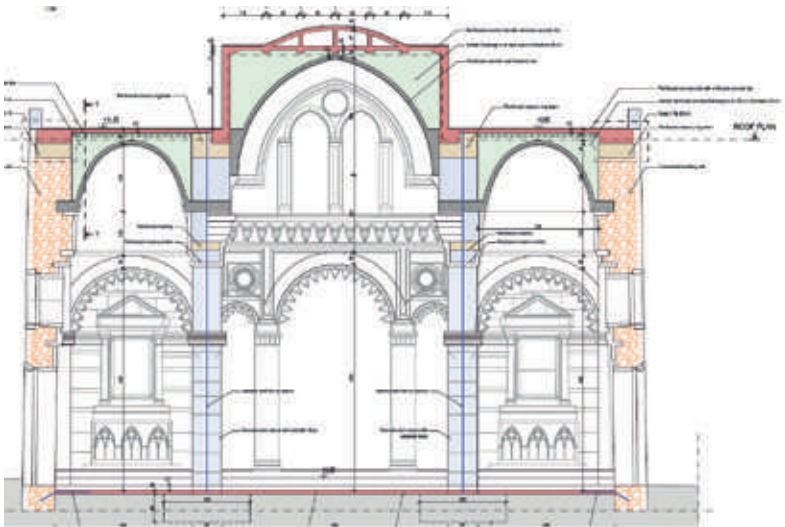
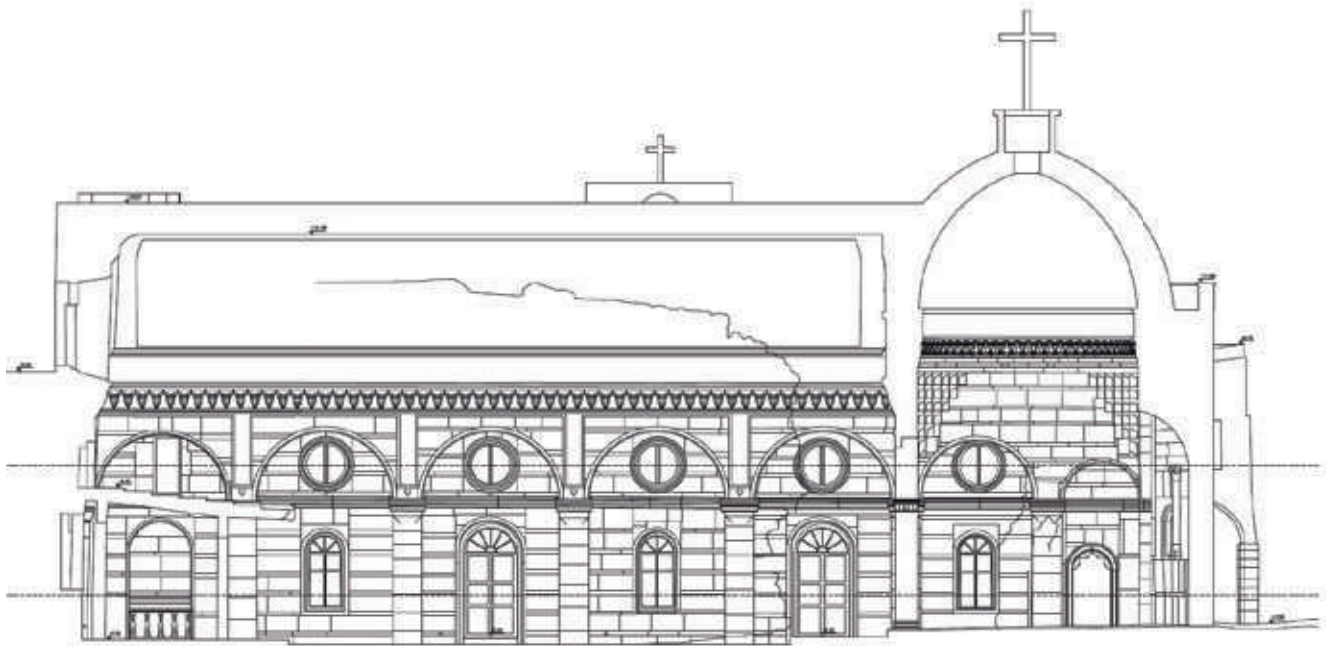
< Plan of the church and south elevation before and after the war | Planta de la iglesia y alzado sur antes y después de la guerra | Planta da igreja e alçado sul antes e depois da guerra (UNESCO)
> 1, 2: Al-Tahera Church after its destruction in 2017 3, 4: Al-Tahera Church after demining and rubble removal in 2020 | 1, 2: Iglesia de Al-Tahera tras su destrucción en 2017 3, 4: Iglesia de Al-Tahera después del desminado y la retirada de escombros en 2020 | 1, 2: Igreja de Al-Tahera após a sua destruição em 2017 3, 4: Igreja de Al-Tahera após o desminagem e a remoção dos escombros em 2020 (UNESCO)



Thus the restoration project, led by UNESCO, sought to faithfully reconstruct the church while preserving its original architectural character and reusing as much of the surviving material as possible. The aim was to maintain Al-Tahera’s authenticity and its enduring significance as a symbol of Mosul’s cultural and spiritual heritage.

Por ello, con el proyecto de restauración dirigido por la UNESCO, se buscaba reconstruir fielmente la iglesia y mantener su carácter arquitectónico original reutilizando en la medida de lo posible los materiales originales. Se trataba de conservar la originalidad de al-Tahira y su importancia duradera como símbolo del legado cultural y espiritual de Mosul.

Assim, o projeto de restauração, liderado pela UNESCO, procurou reconstruir fielmente a igreja, preservando o seu caráter arquitectónico original e reutilizando o máximo possível do material sobrevivente. O objetivo era manter a autenticidade de Al-Tahera e o seu significado duradouro como símbolo do património cultural e espiritual de Mossul.



Longitudinal section of the church before the war and project cross section showing the different construction phases | Sección longitudinal del estado previo a la guerra y sección transversal de proyecto con las diferentes etapas de construcción | Secção longitudinal do estado anterior à guerra e secção transversal do projeto com as diferentes etapas de construção



1



2



3



4

1: Muqarnas of the main dome 2: Frieze of the central nave 3: Frieze of the dome 4: Cornice | 1: Mocárabes de la cúpula principal 2: Friso de la nave central 3: Friso de la cúpula 4: Cornisa | 1: Muqarnas da cúpula principal 2: Friso da nave central 3: Friso da cúpula 4: Cornija (Anas Zeyad Abdulmalek)

Decorative Alabaster Elements

The church’s alabaster muqarnas (honeycomb vaulting) are carved in two sizes: larger for the main dome and smaller for the domes of the two chapels flanking the altar, and was probably originally painted blue.

The nave features a double frieze: one of overlaid alabaster pieces and another molded in gypsum plaster, as is visible in the sectional view. The nave also has a cornice above the column capitals, with a matching molding along the side

Elementos decorativos de alabastro

Los mocárabes de alabastro de la iglesia son de dos tamaños: más grandes en la cúpula principal y menores en las cúpulas de las dos capillas que flanquean el altar y que probablemente estuvieron pintadas originalmente en color azul.

La nave presenta un doble friso: uno de piezas de alabastro superpuestas y otro moldeado en yeso, como puede observarse en la vista en sección. Sobre los capiteles de las columnas de la nave hay una cornisa, con una moldura a juego

Elementos decorativos em alabastro

As mucarnas (abóbada em favo de mel) da igreja, em alabastro, foram esculpidas em dois tamanhos: maior para a cúpula principal e menor para as cúpulas das duas capelas que ladeiam o altar. E, provavelmente, foram originalmente pintadas de azul.

A nave apresenta um friso duplo: um composto por peças de alabastro sobrepostas e outro moldado em gesso, como é visível na vista em corte. A nave tem uma cornija acima dos capitéis das



walls. The cornice is currently painted white and blue, with traces of green visible in some parts.

The frieze in the dome is carved from single pieces of alabaster 36 cm high, 23 cm long, and 63 cm deep, with three layers of color: a blue base, a multicolored layer (blue, red, and green), and a white finish.

Challenges

The restoration faced formidable challenges. The site first required demining, followed by consolidation of unstable sections and careful demolition of concrete structures. From the rubble, over 7,000 original alabaster stones were meticulously recovered by hand. All stones, particularly those intended for columns and arches, underwent

en las paredes laterales. Actualmente, la cornisa está pintada en blanco y azul, pero se aprecian restos de color verde en algunas partes.

El friso de la cúpula está labrado en bloques de alabastro de 36 cm de alto, 23 cm de largo, y 63 cm de espesor, con tres capas de color: una base azul, una capa de varios colores (azul, rojo y verde), y el acabado en blanco.

Retos

En la restauración se afrontaron retos enormes. En primer lugar, hubo que desminar el terreno; después se consolidaron las partes inestables y se demolieron con mucho cuidado las estructuras de hormigón. De entre los escombros se recuperaron meticulosamente más de 7.000 piedras de alabastro. Todas ellas, especialmente

colunas, com uma moldura a condizer ao longo das paredes laterais. A cornija está atualmente pintada de branco e azul, com vestígios de verde visíveis em algumas partes.

O friso na cúpula é esculpido a partir de peças inteiras de alabastro com 36 cm de altura, 23 cm de comprimento e 63 cm de profundidade, com três camadas de cor: uma base azul, uma camada multicolorida (azul, vermelho e verde) e um acabamento branco.

Desafios

A restauração enfrentou desafios formidáveis. O local precisou primeiro ser desminado, seguido pela consolidação de seções instáveis e pela demolição cuidadosa de estruturas de betão. Dos escombros, mais de 7.000 pedras de alabastro originais foram meticulosamente recuperadas à mão. Todas as pedras, particularmente aquelas destinadas a

ultrasonic testing and consolidation prior to reuse.

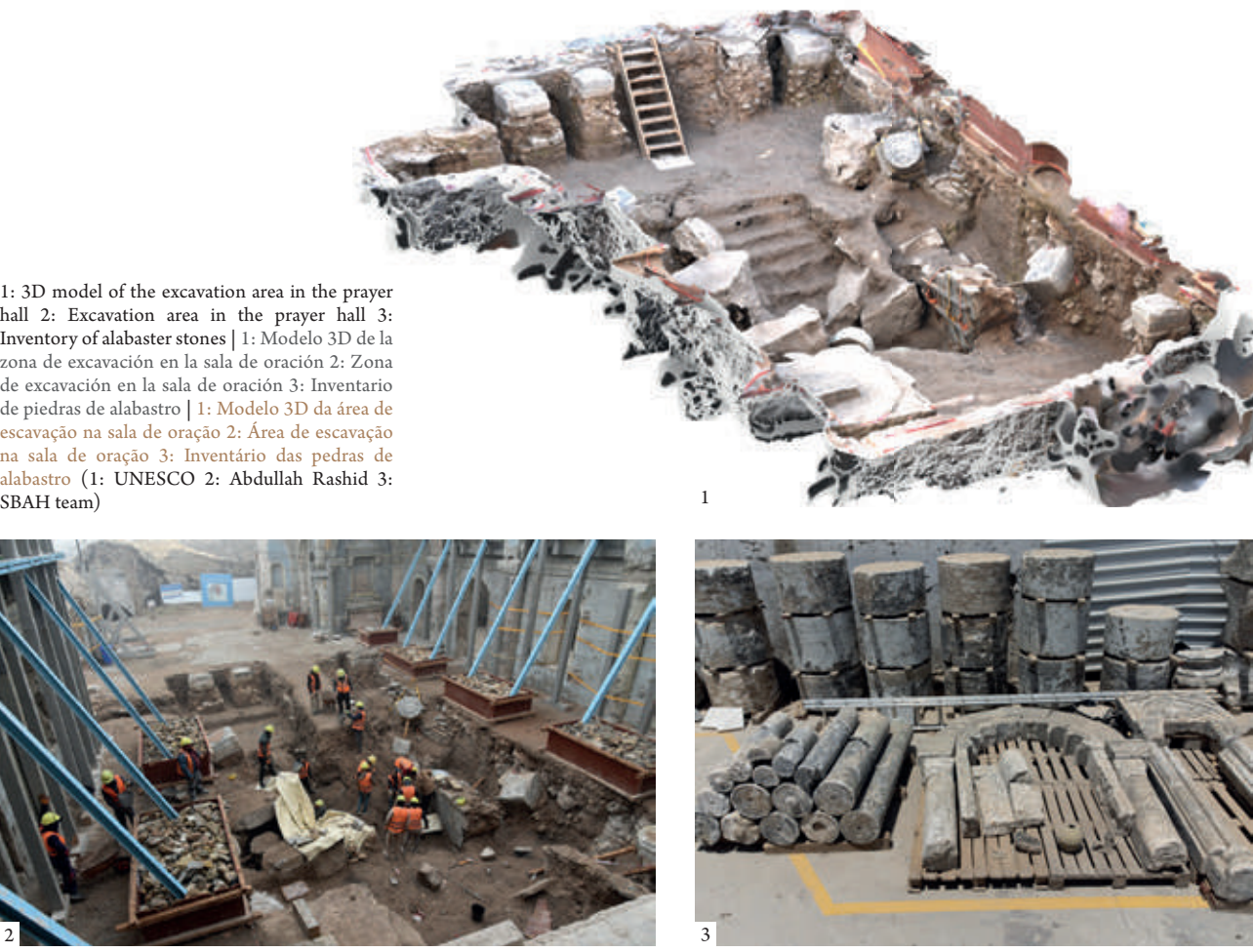
Integrating these salvaged materials involved technical and logistical challenges. While compatible local materials were prioritized, structural reinforcement systems—stainless steel tie rods, carbon-fiber reinforced polymers, natural hydraulic lime, etc.—had to be imported. A further challenge lay in harmonizing original fragments with newly built sections, ensuring that the building was structurally stable without compromising its authenticity.

las destinadas a las columnas y los arcos, se sometieron a ensayos por ultrasonidos y se consolidaron antes de utilizarlas.

La integración de los materiales recuperados planteó retos técnicos y logísticos. Si bien se dio prioridad a los materiales locales, los sistemas de refuerzo estructural –tirantes de acero inoxidable, polímeros reforzados con fibra de carbono, cal hidráulica natural– tuvieron que importarse. Otro reto fue la armonización de los fragmentos originales con las partes de nueva construcción para garantizar que el edificio fuera estructuralmente estable sin perder su autenticidad.

colunas e arcos, foram submetidas a testes ultrassônicos e consolidação antes de serem reutilizadas.

A integração desses materiais recuperados implicou desafios técnicos e logísticos. Embora os materiais locais compatíveis tenham sido priorizados, os sistemas de reforço estrutural — tirantes de aço inoxidável, polímeros reforçados com fibra de carbono, cal hidráulica natural, etc. — tiveram que ser importados. Um desafio adicional foi harmonizar os fragmentos originais com as seções recém-construídas, garantindo que o edifício fosse estruturalmente estável sem comprometer sua autenticidade.



Excavation of Column Bases

The excavation and uncovering of column bases proved complex. Many bases had been displaced by the airstrikes, and one entire section of masonry was discovered 1.5 meters below ground. This was carefully documented and dismantled. A whole column of five alabaster pieces was unearthed from a 2-meter deep crater. The six-month excavation was carried out entirely by hand, with no heavy machinery or equipment liable to generate vibration. A team of 20 workers participated in this meticulous process for the preservation of all structural and heritage elements.

Original Stone Inventory

Over 7,000 original stones were collected, stored, structurally tested, and consolidated for reuse. Employees of the Ninawa State Board of Antiquities documented each one and some 72 percent were used in the restoration.



Excavación de las basas de las columnas

La excavación y recuperación de las basas de las columnas fue muy complicada. Muchas de las basas habían sido desplazadas durante los bombardeos y se encontró una sección completa de mampostería a metro y medio bajo tierra. Todo esto se documentó y desmanteló cuidadosamente. A 2 metros de profundidad se desenterró una columna entera formada por cinco piezas de alabastro. La excavación, que duró seis meses, se hizo a mano, sin utilizar ningún tipo de maquinaria pesada o equipamientos que pudieran provocar vibraciones. Un equipo de 20 obreros participó en el proceso meticuloso de conservación de todos los elementos estructurales y de interés patrimonial.

Inventario de piedras originales

Se recuperaron y almacenaron más de 7.000 piedras originales que se sometieron a análisis estructurales y se consolidaron para volver a utilizarlas. Empleados del Consejo de Antigüedades de la Gobernación de Nínive documentaron

Escavação das bases das colunas

A escavação e descoberta das bases das colunas revelaram-se complexas. Muitas bases tinham sido deslocadas pelos ataques aéreos, e uma secção inteira de alvenaria foi descoberta 1,5 metros abaixo do solo. Esta foi cuidadosamente documentada e desmontada. Uma coluna inteira de cinco peças de alabastro foi desenterrada de uma cratera com 2 metros de profundidade. A escavação, que durou seis meses, foi realizada inteiramente à mão, sem o uso de máquinas pesadas ou equipamentos que pudessem gerar vibração. Uma equipa de 20 trabalhadores participou nesse processo meticuloso para a preservação de todos os elementos estruturais e patrimoniais.

Inventário original de pedras

Mais de 7.000 pedras originais foram recolhidas, armazenadas, testadas estruturalmente e consolidadas para reutilização. Os funcionários do Conselho Estadual de Antiguidades de Ninawa documentaram cada uma delas e cerca

< Sculptor from Mosul specialized in restoring and conserving original alabaster stones | Escultor de Mosul especializado en la restauración y la conservación de piedras de alabastro originales | Escultor de Mossul especializado na restauração e conservação das pedras de alabastro originais

> 1: Installation of the first column 2, 3: Masonry construction 4: Construction of the main dome 5: Aerial view of the construction | 1: Instalación de la primera columna 2, 3: Construcción en mampostería 4: Construcción de la cúpula principal 5: Vista aérea de la construcción | 1: Instalação da primeira coluna 2, 3: Construção em alvenaria 4: Construção da cúpula principal 5: Vista aérea da construção (1: Anas Zeyad Abdulmalek 2, 3, 5: Abdullah Rashid 4: SBAH team)

Each stone was labeled with a number indicating its sequence, original location, dimensions, and specific damage, ensuring precise placement and preservation of authenticity in reconstruction.

Consolidation Phase

Before the restoration began, the remaining structure was consolidated and collapsed parts were cleared, preventing any further damage. The

cada una de las piedras y se utilizó un 72% de ellas en la restauración. Cada piedra se etiquetó con un número que indicaba su secuencia, ubicación original, así como sus dimensiones y daños específicos para garantizar su colocación precisa y conservar la autenticidad de la restauración.

Fase de consolidación

Antes de iniciar la restauración, se consolidó lo que quedaba en pie de la estructura y las partes destruidas se retiraron para evitar más daños. Los

de 72% foram utilizadas na restauração. Cada pedra foi identificada com um número indicando a sua sequência, localização original, dimensões e danos específicos, garantindo a colocação precisa e a preservação da autenticidade na reconstrução.

Fase de Consolidação

Antes do início da restauração, a estrutura remanescente foi consolidada e as partes desmoronadas foram removidas, evitando danos adicionais. As paredes foram



walls were reinforced with wooden and steel elements to protect against seismic activity and vibration, and the vaults were consolidated to ensure stability throughout the restoration process.

muros se reforzaron con elementos de madera y acero para protegerlos de la actividad sísmica y las vibraciones, y las bóvedas se consolidaron para garantizar la estabilidad durante todo el proceso de restauración.

reforçadas com elementos de madeira e aço para proteger contra atividade sísmica e vibração, e as abóbadas foram consolidadas para garantir a estabilidade durante todo o processo de restauração.

1: Reconstruction of the vaults 2: Construction of the brick wall 3: Construction of the limestone arch | 1: Reconstrucción de las bóvedas 2: Construcción del muro de ladrillo 3: Construcción del arco de piedra caliza | 1: Reconstrução das abóbadas 2: Construção do muro de tijolo 3: Construção do arco de pedra calcária (1, 2: SBAH team 3: Abdullah Rashid)



Execution and Crafts

The restoration works, entrusted to a local contractor working under UNESCO supervision, commenced in early 2020 and were completed in June 2024. Traditional trades were promoted through having skilled craftspeople from Mosul and surrounding areas execute the hand-carved stone and alabaster details. An intergenerational transfer of skills supported local craftsmanship and

Ejecución y oficios

Los trabajos de restauración, que se confiaron a una empresa local bajo la supervisión de la UNESCO, comenzaron a principios de 2020 y se terminaron en junio de 2024. Se fomentaron los oficios tradicionales, ya que expertos artesanos de Mosul y alrededores labraron a mano la piedra y los detalles de alabastro. La transmisión intergeneracional de conocimientos y técnicas ayudó a los

Execução e Artesanato

Os trabalhos de restauração, confiados a um empreiteiro local que trabalha sob a supervisão da UNESCO, começaram no início de 2020 e foram concluídos em junho de 2024. Os ofícios tradicionais foram promovidos através da contratação de artesãos qualificados de Mossul e arredores para executar os detalhes esculpidos à mão em pedra e alabastro. A transferência intergeracional de

Hand carving | Talla manual | Talha manual (Abdullah Rashid)



Conservation works | Trabajos de conservación | Trabalhos de conservação (Abdullah Rashid)





also provided economic opportunities for the community, making the project a restoration of both the building and a living tradition.

From the rubble, the team salvaged and reused four original columns and two original arches; the remaining elements were replaced with new stonework closely matching the original. The domes were reconstructed as originally built, with vaults and ribs, and consolidated with carbon-fiber reinforced polymers for improved seismic performance. Stainless steel tie rods were inserted for additional stability. Natural hydraulic lime, imported from Italy and used for the first time in Iraq, provided compatibility with the original mortar.

The church bells, stolen by ISIS, were recast by one of the world’s oldest bell foundries, the Pontificia Fonderia Marinelli in Agnone, Italy. After a silence of ten years, the Al-Tahera bells

artesanos locales y ofreció oportunidades económicas a la comunidad, por lo que el proyecto no sólo sirvió para restaurar un edificio, sino también una tradición viva.

De entre los escombros, el equipo recuperó y utilizó cuatro columnas y dos arcos originales; el resto de los elementos se sustituyó con cantería nueva muy parecida a la original. Las cúpulas se reconstruyeron siguiendo el modelo original, con bóvedas y nervaduras, y se consolidaron con polímeros reforzados con fibra de carbono para mejorar su resistencia a los seísmos. Se insertaron tirantes de acero inoxidable para mayor estabilidad. La cal hidráulica natural, importada de Italia y que se utilizaba por primera vez en Irak, demostró su compatibilidad con el mortero original.

Las campanas de la iglesia, robadas por el Estado Islámico, se fabricaron de nuevo en una de las fundiciones más antiguas del mundo, la Pontificia Fonderia Marinelli de Agnone, en Italia. Tras un silencio de

competências apoiou o artesanato local e também proporcionou oportunidades económicas para a comunidade, tornando o projeto uma restauração tanto do edifício como de uma tradição viva.

Dos escombros, a equipa recuperou e reutilizou quatro colunas originais e dois arcos originais; os elementos restantes foram substituídos por novas pedras muito parecidas com as originais. As cúpulas foram reconstruídas como as originais, com abóbadas e nervuras, e consolidadas com polímeros reforçados com fibra de carbono para melhorar o desempenho sísmico. Foram inseridos tirantes de aço inoxidável para uma maior estabilidade. A cal hidráulica natural, importada da Itália e usada pela primeira vez no Iraque, proporcionou compatibilidade com a argamassa original.

Os sinos da igreja, roubados pelo ISIS, foram refundidos por uma das fundições de sinos mais antigas do mundo, a Pontificia Fonderia Marinelli, em

again ring out across the Old City of Mosul.

A team of Italian conservators cleaned the alabaster surfaces and painted layers, assisted by ten Iraqi fine arts graduates. The surfaces were cleaned by chemical methods without mechanical intervention, avoiding the local practice of grinding, which might have damaged

diez años, las campanas de al-Tahira tocan de nuevo en el casco viejo de Mosul.

Un equipo de restauradores italianos limpió las superficies de alabastro y las capas de pintura con la ayuda de diez graduados en Bellas Artes iraquíes. Las superficies se limpiaron con métodos químicos sin intervención mecánica, y se evitó el esmerilado típico de la zona,

Agnone, Itália. Após um silêncio de dez anos, os sinos de Al-Tahera voltam a tocar na Cidade Velha de Mossul.

Uma equipa de conservadores italianos limpou as superfícies de alabastro e as camadas pintadas, com a ajuda de dez licenciados em belas-artes iraquianos. As superfícies foram limpas com recurso a métodos químicos, sem intervenção



< Prayer hall | Sala de oración | Sala de oração (Abdullah Rashid)
> Altar of Saint Ephraim | Altar de San Efrén | Altar de São Efrém (Abdullah Rashid)



1, 2: Exterior views of the church 3–4: Architectural details of the façades | 1, 2: Vistas exteriores de la iglesia 3,4: Detalles arquitectónicos de las fachadas | 1, 2: Vistas exteriores da igreja 3, 4: Detalhes arquitetônicos das fachadas (Abdullah Rashid)

the stone. After extensive testing for timing, efficiency, and safety, a locally available acetone gel was applied using the azeotrope method, preserving the alabaster along with its heritage value.

que podría haber dañado la piedra. Tras realizar pruebas exhaustivas de tiempo, eficacia y seguridad, se aplicó un gel de acetona local utilizando el método azeótropo para conservar el alabastro y su valor histórico.

mecânica, evitando a prática local de esmerilagem, que poderia danificar a pedra. Após testes exaustivos de tempo, eficiência e segurança, foi aplicado um gel de acetona disponível localmente, utilizando o método azeótropo, preservando o alabastro e o seu valor patrimonial.

Opening Ceremony

Al-Tahera Church was reopened with an emotional ceremony at which Christians returned to pray within its restored walls for the first time since its destruction. This historic moment sent a powerful message of hope and peace, demonstrating that heritage restoration can serve as a path to reconciliation and coexistence. The revival of Al-

Ceremonia inaugural

La iglesia de al-Tahira se reinauguró en una ceremonia emocionante en la que los cristianos volvieron a rezar entre los muros reconstruidos por primera vez desde su destrucción. Este momento histórico transmitió un mensaje contundente de paz y esperanza, una demostración de que la restauración del patrimonio es una vía de reconciliación y convivencia. La

Ceremônia de Abertura

A Igreja Al-Tahera foi reaberta com uma cerimônia emocionante, na qual os cristãos voltaram a rezar dentro das suas paredes restauradas pela primeira vez desde a sua destruição. Este momento histórico enviou uma poderosa mensagem de esperança e paz, demonstrando que a restauração do patrimônio pode servir como um caminho para a reconciliação

Tahera involves the recovery not just of a monument but also of the spirit of Mosul, affirming that through heritage, communities can heal, reunite, and look toward a shared future.

rehabilitación de al-Tahira representa la recuperación no sólo de un monumento, sino del espíritu de Mosul, y confirma que mediante el patrimonio las comunidades pueden curar sus heridas, reconciliarse y mirar hacia un futuro común.

e a coexistência. O renascimento de Al-Tahera envolve a recuperação não apenas de um monumento, mas também do espírito de Mossul, afirmando que, através do patrimônio, as comunidades podem curar-se, reunir-se e orientar-se para um futuro comum.

References | Referencias | Referências

Mérigoux, Jean-Marie. 1983. *Les chrétiens de Mossoul et leurs églises pendant la période ottomane de 1516 à 1815*. Mossoul–Ninive: s.n.

Biography | Biografia | Biografia

Anas Zeyad Abdulmalek

Anas Zeyad Abdulmalek is a Heritage Conservation and Site Engineer with extensive experience in the preservation of historic buildings in Mosul, Iraq. Between 2020 and 2025, he worked with UNESCO on the reconstruction of Al-Tahera Syriac Catholic Church and Al-Nouri Mosque, with its iconic Al-Hadba minaret—two of Mosul’s most emblematic landmarks, destroyed in the recent conflict. His expertise spans structural stabilization, stone conservation, and the integration of traditional craftsmanship with modern engineering techniques. He has completed multiple international training programs with ICCROM and other institutions, earning a Diploma in Stone Conservation in Mexico in 2023. In 2024, he was awarded the UNESCO Medal by Director-General Audrey Azoulay for his contributions to reviving Mosul’s cultural heritage, peace, and coexistence.

Anas Zeyad Abdulmalek es ingeniero de obra y conservación del patrimonio con amplia experiencia en la conservación de los edificios históricos de Mosul (Irak). Entre 2020 y 2025 ha trabajado con la UNESCO en la reconstrucción de la iglesia católica siríaca de al-Tahira y la mezquita de al-Nouri, con su icónico alminar de al-Hadba, dos de los monumentos más emblemáticos de Mosul destruidos durante el último conflicto. Es experto en estabilización estructural, conservación de piedra e integración de la artesanía tradicional con las técnicas modernas de ingeniería. Ha seguido numerosos programas de formación internacional del ICCROM y otras instituciones, y en 2023 obtuvo el Diploma de Conservación de la Piedra en México. En 2024, Audrey Azoulay, Directora General de la UNESCO, le concedió la medalla de este organismo por sus contribuciones a la recuperación del patrimonio cultural, la paz y la convivencia en Mosul.

Anas Zeyad Abdulmalek é engenheiro civil e de conservação do patrimônio com vasta experiência na preservação de edifícios históricos em Mossul, no Iraque. Entre 2020 e 2025, trabalhou com a UNESCO na reconstrução da Igreja Católica Siríaca Al-Tahera e da Mesquita Al-Nouri, com o seu icônico minarete Al-Hadba — dois dos marcos mais emblemáticos de Mossul, destruídos no recente conflito. A sua experiência abrange a estabilização estrutural, conservação de pedra e integração do artesanato tradicional com técnicas modernas de engenharia. Concluiu vários programas de formação internacionais com o ICCROM e outras instituições, obtendo um diploma em Conservação de Pedra no México em 2023. Em 2024, foi condecorado com a Medalha da UNESCO pela Diretora-Geral Audrey Azoulay pelas suas contribuições para o renascimento do patrimônio cultural, da paz e da coexistência em Mossul.

Ali Salem Al-Khatabi

Ali Salem Al-Khatabi is an archaeologist and Director of the Heritage Unit at the Department of Antiquities and Heritage in Nineveh. He holds a Master’s degree in Ancient Architecture from the University of Mosul (2011). His work focuses on the preservation and restoration of Mosul’s historical landmarks, including the Al-Tahera Syriac Catholic Church (2020–2025, with UNESCO) and the reconstruction of the Al-Aghawat Mosque minaret (2025). He participated in the rescue of artifacts in Nimrud (2018) and the Mosul Museum (2019), and serves on the Antiquities Committee for the city’s historic riverfront. Trained by ICCROM and the Smithsonian Institution, he collaborates with UNESCO and ALIPH on heritage reconstruction projects and has received multiple awards for his contributions to cultural heritage in Mosul.

Ali Salem Al-Khatabi es arqueólogo y Director de la Unidad de Patrimonio del Departamento de Antigüedades y Patrimonio de Nínive. Tiene un máster en Arquitectura Antigua por la Universidad de Mosul (2011). Su trabajo se centra en la conservación y la restauración de los monumentos históricos de Mosul, entre ellos la Iglesia Siriaco-Católica de al-Tahira (2020–2025, en colaboración con la UNESCO) y la reconstrucción del alminar de la Mezquita al-Aghawat (2025). Participó en el rescate de artefactos en Nimrud (2018) y en el Museo de Mosul (2019), y forma parte del Comité de Antigüedades para la reconstrucción del frente histórico de la ciudad junto al Tigris. Formado por el ICCROM y el Smithsonian, colabora con la UNESCO y ALIPH en proyectos de reconstrucción patrimonial y ha recibido diversos reconocimientos por su contribución al patrimonio cultural en Mosul.

Ali Salem Al-Khatabi é arqueólogo e Diretor da Unidade de Patrimônio do Departamento de Antiguidades e Patrimônio de Nínive. Possui mestrado em Arquitetura Antiga pela Universidade de Mossul (2011). Seu trabalho concentra-se na preservação e restauração dos marcos históricos de Mossul, incluindo a Igreja Sírio-Católica de Al-Tahera (2020–2025, em colaboração com a UNESCO) e a reconstrução do minarete da Mesquita Al-Aghawat (2025). Participou do resgate de artefatos em Nimrud (2018) e no Museu de Mossul (2019), e integra o Comitê de Antiguidades responsável pela frente histórica da cidade às margens do rio Tigre. Formado pelo ICCROM e pela Instituição Smithsonian, colabora com a UNESCO e a ALIPH em projetos de reconstrução do patrimônio e recebeu diversas distinções por suas contribuições ao patrimônio cultural em Mossul.

Restoration of a barraca cottage in the Valencian Albufera

La restauración de una barraca en la Albufera de Valencia

A restauração de uma barraca na Albufera de Valência

Fernando Vegas
López-Manzanares,
Camilla Mileto

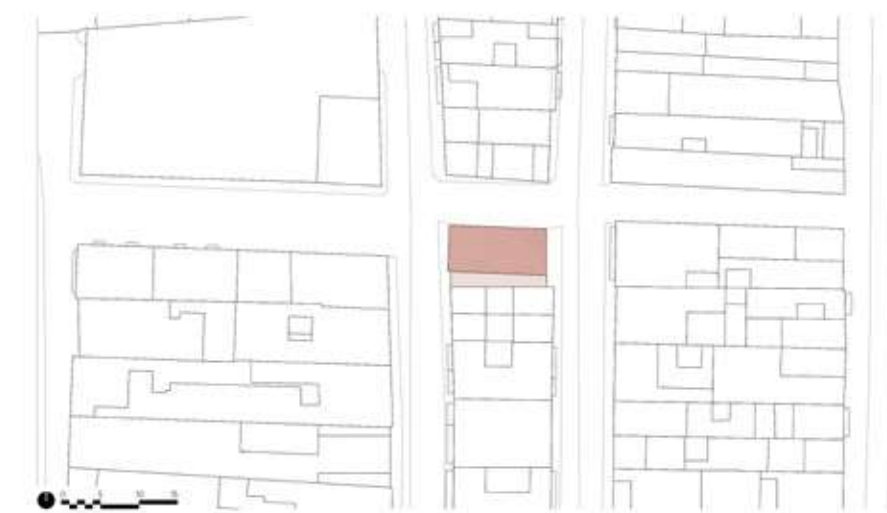
This traditional cottage, known as Barraca de los Aranda, is in El Palmar, an old village on an island in the Albufera lagoon near Valencia. It formerly consisted of about a hundred cottages of the same type, of which just half a dozen remain (Rosselló 1995). The villagers, originally fishermen and hunters on the lagoon, progressively became rice growers and subsequently village restaurateurs, as their architecture was likewise transformed (Thede 1933; Bellón 2014).

La barraca de los Aranda se encuentra en El Palmar, un antiguo asentamiento situado en una isla de la Albufera de Valencia. En otro tiempo este enclave estaba formado exclusivamente por un centenar de barracas del mismo tipo, de las cuales hoy solo sobreviven media docena (Rosselló 1995). Sus habitantes originarios, pescadores y cazadores de la laguna, fueron transformándose al tiempo que la arquitectura en agricultores dedicados al cultivo del arroz y, más tarde, en propietarios de restaurantes en el propio pueblo (Thede 1933; Bellón 2014).

A cabana dos Aranda fica em El Palmar, uma antiga povoação situada numa ilha da Albufera de Valência. Antigamente, este enclave era formado exclusivamente por uma centena de cabanas do mesmo tipo, das quais hoje restam apenas meia dúzia (Rosselló 1995). Os seus habitantes originais, pescadores e caçadores da lagoa, foram-se transformando, tal como a arquitetura, em agricultores dedicados ao cultivo de arroz e, mais tarde, em proprietários de restaurantes da aldeia (Thede 1933; Bellón 2014).

< View of the loft in the cottage with a sanded and waxed gypsum floor | Vista del altillo de la barraca con el pavimento de yeso lijado y encerado | Vista do sótão da cabana com pavimento de gesso lixado e encerado

> Location plan of the cottage on El Palmar Island, in the Albufera of Valencia | Plano de situación de la barraca en la isla de El Palmar, en la Albufera de Valencia | Planta de localização da cabana na ilha de El Palmar, na Albufera de Valência



The cottage is a freestanding structure in the middle of the village, on a rectangular plan of about 6 × 12 m and with a gable roof with a pitch of some 45°. It has earthen walls and a collar-beam roof, in which the tie beams also serve as joists for a loft occupying part of the roof space. It has entrances in

Se trata de una construcción exenta, situada en el centro del pueblo, con planta rectangular de aproximadamente 6 × 12 m y cubierta apuntada de dos faldones con una pendiente de unos 45°. Está construida con muros de tierra y una estructura de madera de *par y nudillo*, en la que los tirantes actúan también como

Trata-se de uma construção isolada, situada no centro da aldeia, com planta retangular de aproximadamente 6 × 12 m e cobertura pontiaguda de duas águas com uma inclinação de cerca de 45°. É construída com paredes de terra e uma estrutura de madeira de *par y nudillo*, na qual os tirantes também funcionam

its east and west facades, an exterior passage on the south side, separating it from the adjoining modern building and facilitating maintenance, and a broad street on the north side.

The cottage of Los Aranda is most likely the oldest of the 30 or 40 structures of this type that remain along the coast near Valencia. Its adobe masonry surmounted by hand-formed earthen walling, its inner walls still containing cane wattle and rendered with mud and limewash, the unusual configuration of its timber framework, with traces of hatchet cuts and loggers’ hooks, the T-hinges on its interior joinery, and vestiges of a former rounded windward wall at its east end—all this allows it to be dated to at least the late eighteenth century (Michavila 1918; Almela i Vives 1930; Sanchis Guarner 1957). This is exceptional for such buildings, which would often succumb to fire or to abuses by powerful local figures, intransigent regulations, or customary methods of maintenance and replacement (Gosálvez 1998a; 1998b).

The cottage was refurbished several times in the first half of the twentieth century. A hearth was added, with a chimney through the thatched roof; interior walls of thin ceramic brick were erected to partition the common area into two rooms, paved with cement tiles, and the floor in the rest of the space was cemented over. Also added were a cast-stone basin and a toilet. The rounded windward end was straightened with a flat wall of ceramic brick. Later the original wattle and daub in the west gable end was replaced with hollow-brick masonry.

viguetas para un altillo que ocupa parte del espacio interior. Dispone de accesos por las fachadas este y oeste, un corredor exterior en el lado sur, que la separa del edificio moderno contiguo y facilita las labores de mantenimiento, así como una calle-explanada en el lado norte.

La barraca de los Aranda es, con toda probabilidad, la más antigua de entre las 30 o 40 construcciones de este tipo que aún se conservan en la costa valenciana, en torno a la capital. Sus muros de adobe coronados por muros de tierra conformada a mano, la tabiquería interior aún encañizada, enlucida con barro y encalada en blanco, la singular configuración de su estructura de madera —que conserva trazas de corte con achuela y marcas de gancho—, las bisagras de lengüeta de la carpintería interior y los indicios de haber tenido una culata o ábside en su fachada este, permiten datarla, al menos, a finales del siglo XVIII (Michavila 1918; Almela i Vives 1930; Sanchis Guarner 1957). Se trata de una cronología excepcional para este tipo de edificaciones, que fueron con frecuencia pasto de las llamas o víctimas de abusos de caciques, normativas intransigentes o prácticas habituales de mantenimiento y sustitución (Gosálvez 1998a; 1998b).

Esta barraca sufrió diversas transformaciones a lo largo de la primera mitad del siglo XX. Se añadió una chimenea cuyo tiro emerge de la cubierta vegetal; se construyeron tabiques interiores de rasilla cerámica para dividir el espacio común en dos habitaciones, que fueron pavimentadas con baldosas hidráulicas, mientras que el espacio común restante se cubrió con una solera de cemento. También se incorporaron una pila de piedra artificial y un aseo. Asimismo, se cercenó el ábside o culata oriental y fue sustituido por un hastial plano de rasilla cerámica. Más tarde se reemplazó el encañizado original del hastial de fachada oeste por fábrica de ladrillo hueco.

como vigas para um sótão que ocupa parte do espaço interior. Tem acessos pelas fachadas leste e oeste, um corredor exterior no lado sul, que a separa do edifício moderno adjacente e facilita as tarefas de manutenção, bem como uma rua-esplanada no lado norte.

A cabana dos Aranda é, muito provavelmente, a mais antiga das 30 ou 40 construções deste tipo que ainda se encontram na costa valenciana, em torno da capital. As suas paredes de adobe coroadas por paredes de terra moldadas à mão, as paredes divisórias interiores ainda com caniço, rebocadas com barro e caiadas de branco, a configuração singular da sua estrutura de madeira — que conserva vestígios de cortes com machado e de transporte —, as dobradiças de lingueta da carpintaria interior e os indícios de ter tido uma culatra ou abside na sua fachada leste, permitem datá-la, pelo menos, do final do século XVIII (Michavila 1918; Almela i Vives 1930; Sanchis Guarner 1957). Trata-se de uma cronologia excecional para este tipo de edifícios, que eram frequentemente consumidas por incêndios ou vítimas de abusos por parte de caciques, regulamentos intransigentes ou práticas habituais de manutenção e substituição (Gosálvez 1998a; 1998b).

Esta cabana sofreu várias transformações ao longo da primeira metade do século XX. Foi adicionada uma chaminé cujo tiro emerge da cobertura vegetal; foram construídas paredes divisórias interiores de tijolo cerâmico para dividir o espaço comum em duas divisões, que foram pavimentadas com ladrilhos hidráulicos, enquanto o espaço comum restante foi coberto com uma laje de cimento. Também foram incorporados uma pia de pedra artificial e uma casa de banho. Além disso, a abside ou culatra oriental foi cortada e substituída por uma empena plana de tijolo cerâmico. Mais tarde, o caniçado original da empena da fachada oeste foi substituído por alvenaria de tijolo furado.



The cottage seen from the east, before and after the restoration | La barraca vista desde el este, antes y después de la intervención | A cabana vista desde o leste, antes e depois da intervenção

The cottage was used as a dwelling up to the first few years of the twenty-first century. Its owner would show curious visitors around with a blend of pride and affability. After his death, the structure started to deteriorate progressively for lack of maintenance. The absence of stabilizing ties, of which some had been truncated and others were being consumed by termites, was allowing the rafters to push the side walls out, opening a hole at the ridge and exacerbating the roof’s existing leaks, thereby accelerating the deterioration of the timber structure. Though the new owner shored up the building while a rehabilitation project for public use by a cultural association was being drawn up, structural collapse was imminent.

The first action undertaken was a 3D scan of the cottage, which further evidenced the perilous inclination of its side walls along with the bending and buckling in the roof. At the same time, the timber accessible from inside was thoroughly assessed and the damper parts were identified by thermographic exploration. Also studied were the

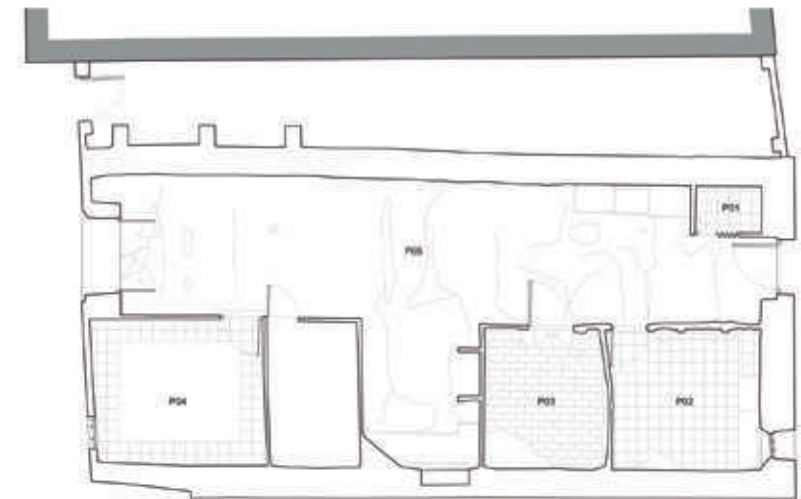
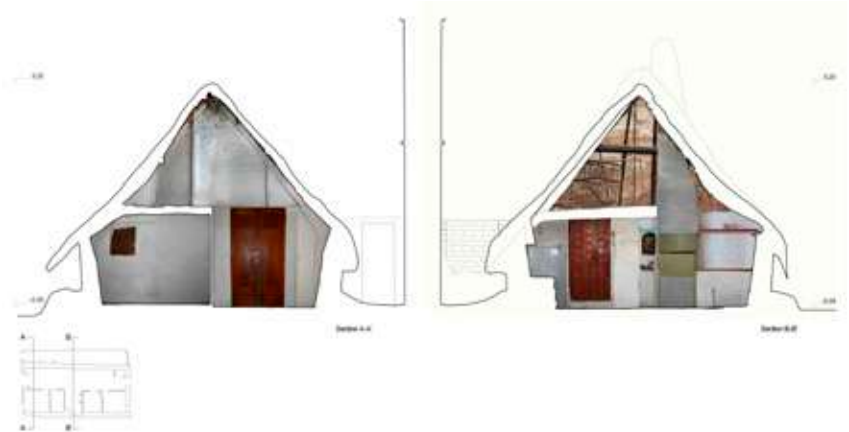
La barraca fue utilizada como vivienda hasta los primeros años del siglo XXI. Su propietario, con una mezcla de orgullo y amabilidad, accedía a que los curiosos visitaran su interior. Tras su fallecimiento la construcción comenzó a degradarse progresivamente por la falta de mantenimiento. La ausencia de tirantes de estabilización –algunos cortados y otros afectados por un grave ataque de termitas– provocó que los pares de la cubierta empujaran los muros laterales hacia fuera. Esta inclinación provocó la apertura de la cumbrera y agravó las infiltraciones existentes en la cubierta, lo que aceleró el deterioro de la estructura de madera. Aunque el nuevo propietario apuntaló el edificio mientras tenía lugar la redacción y la tramitación del proyecto de rehabilitación para su uso público por parte de una asociación cultural, el colapso estructural era ya inminente.

Al actuar se realizó en primer lugar un escaneo tridimensional de la barraca, que dejó aún más patente el estado dramático de la inclinación de sus muros laterales y la flexión y deformación de la cubierta. Simultáneamente, se

A cabana foi usada como habitação até ao início do século XXI. O seu proprietário, com uma mistura de orgulho e amabilidade, permitia que os curiosos visitassem o seu interior. Após a sua morte, a construção começou a degradar-se progressivamente devido à falta de manutenção. A ausência de tirantes de estabilização – alguns cortados e outros afetados por um grave ataque de térmitas – fez com que os *pares* do telhado empurrassem as paredes laterais para fora. Esta inclinação provocou a abertura da cumeeira e agravou as infiltrações existentes no telhado, o que acelerou a deterioração da estrutura de madeira. Embora o novo proprietário tenha escorado o edifício enquanto decorria a elaboração e tramitação do projeto de reabilitação para uso público por parte de uma associação cultural, o colapso estrutural era já iminente.

Foi realizada primeiro uma digitalização tridimensional da cabana, que tornou ainda mais evidente o estado dramático da inclinação das suas paredes laterais e a flexão e deformação da cobertura. Simultaneamente, foi realizado um

Transverse sections of the cottage with their corresponding internal photoplans, showing the collapse of the lateral walls and the deflection of the roof rafters | Secciones transversales de la barraca con sus respectivos fotoplanos internos, donde se aprecia el desplome de los muros laterales y la flecha de los pares de cubierta | Secções transversais da cabana com os respetivos fotoplanos internos, onde se observa o desabamento das paredes laterais e a flecha dos pares da cobertura



Floor plan of the cottage prior to the restoration | Planta de distribución de la barraca anterior a la intervención | Planta de distribuição da cabana anterior à intervenção

materials used, their deterioration, and the strata of successive alterations. An original adobe brick was extracted from the wall and tested for strength, while the structure in its original state was examined, with braces being designed as required to stabilize the side walls. A borehole validated the structural calculation hypotheses made concerning the foundations and an archaeological exploration validated the stratigraphic analysis.

The criteria adopted for the restoration project were compatibility in visual, material, technical, and structural terms; the use of local traditional materials and techniques, to revive and pass on to new generations the trades linked to such historic buildings and also to encourage people to continue living in the village, while contributing to decarbonization (Mileto et al. 2021); and publicity

llevó a cabo un diagnóstico completo de la madera accesible en el interior y una exploración termográfica para identificar los puntos de mayor humedad. Asimismo, se estudió la materialidad, la degradación y la estratigrafía de las sucesivas intervenciones. Se extrajo un adobe originario del muro y se realizaron pruebas de resistencia, al tiempo que se comprobaba la estructura en su estado actual y se diseñaban los refuerzos necesarios para estabilizar los muros laterales. Un sondeo geotécnico confirmó la validez de las hipótesis de cálculo estructural de la cimentación, y la exploración arqueológica hizo lo propio con la lectura estratigráfica.

Los criterios adoptados en el proyecto de restauración fueron la compatibilidad de la intervención desde el punto de vista visual, material, constructivo y estructural; el empleo de materiales y

diagnóstico completo da madeira acessível no interior e uma exploração termográfica para identificar os pontos de maior humidade. Além disso, estudou-se a materialidade, a degradação e a estratigrafia das sucessivas intervenções. Foi extraído um adobe original da parede e foram realizados testes de resistência, ao mesmo tempo que se verificava a estrutura no seu estado atual e se projetavam os reforços necessários para estabilizar as paredes laterais. Uma sondagem geotécnica confirmou a validade das hipóteses de cálculo estrutural da fundação, e a exploração arqueológica fez o mesmo com a leitura estratigráfica.

Os critérios adotados no projeto de restauração foram a compatibilidade do ponto de vista visual, material, construtivo e estrutural; o uso de materiais e técnicas tradicionais locais, não só para reativar e transmitir às novas gerações os ofícios

1: Interior of the cottage before restoration 2: Ridge beam of the cottage, displaced due to the lateral walls’ collapse under the thrust of the rafters 3: Detail showing the widespread condition of termite-damaged wood | 1: Interior de la barraca antes de la restauración 2: Cumbrera de la barraca, abierta por el desplome de los muros laterales bajo el empuje de los pares 3: Detalle del estado generalizado de la madera atacada por termitas | 1: Interior da cabana antes da restauração 2: Cumeeira da cabana, aberta pelo desabamento das paredes laterais sob o empuxo dos pares 3: Detalhe do estado generalizado da madeira atacada por térmitas



and outreach with a view to involving the villagers, the general public in the region, and the media, as a stimulus for the restoration or construction of other such buildings. All these criteria were moreover to be met while upgrading the structure to today’s standards and complying with current regulations, including as regards fire safety.

The project was carried out without altering either of the gable ends, which had to be stabilized, and without ever wholly dismantling the roof. This allowed the look and characteristic profile of the roof slopes to be preserved, while keeping the original building solutions available for reference. From the outset, even as the project was being drawn up, artisans specialized in such buildings were contacted: adobe makers, grass harvesters, thatchers, structural carpenters, and artisans working with earth and lime for the main flooring, or with gypsum for that

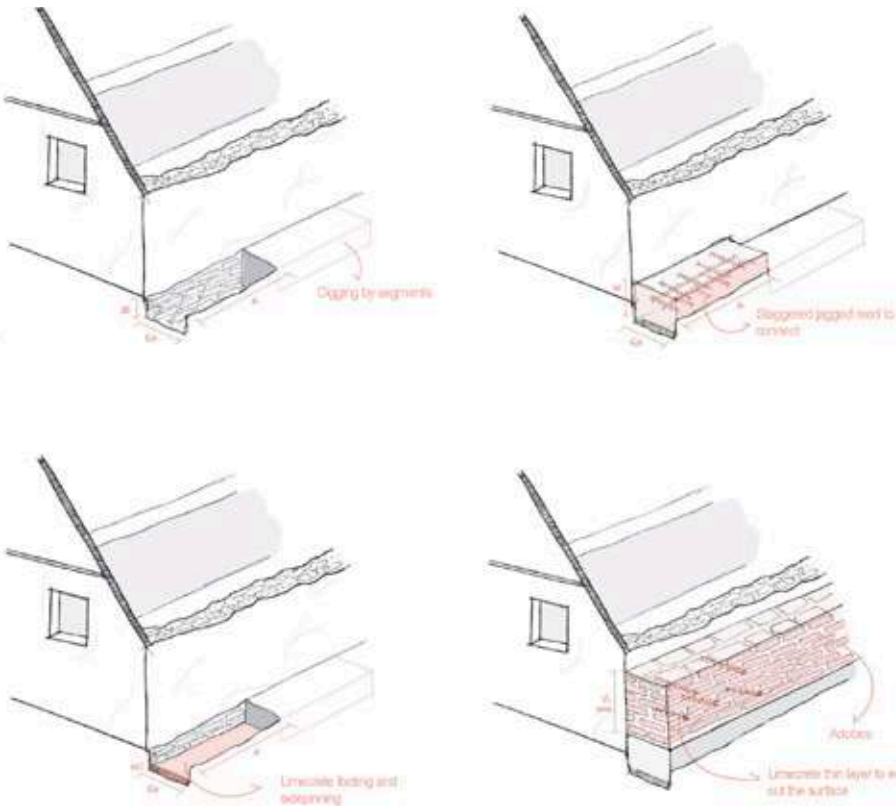
técnicas tradicionales locales, no solo para reactivar y transmitir a nuevas generaciones los oficios vinculados a este tipo de construcciones ancestrales, sino también para favorecer el arraigo de la población en este asentamiento y contribuir de forma significativa a la descarbonización (Mileto et al. 2021); y la difusión y la notoriedad del proceso, con el fin de implicar a los habitantes del pueblo, a la ciudadanía valenciana en general, y a los medios de comunicación, como estímulo para la recuperación o construcción de edificios similares. Además, todos estos criterios debían alcanzarse sin renunciar a la actualización de la edificación según los estándares contemporáneos y al cumplimiento de la normativa vigente, incluida la relativa a la protección contra incendios.

La obra se llevó a cabo sin alterar ninguno de los dos hastiales, que debieron estabilizarse, y sin desmontar completamente la cubierta en ningún

associados a este tipo de construções ancestrais, mas também para favorecer a fixação da população nesta povoação e contribuir significativamente para a descarbonização (Mileto et al. 2021); e a divulgação e notoriedade do processo, com o objetivo de envolver os habitantes da aldeia, os cidadãos valencianos em geral e os meios de comunicação social, como estímulo para a recuperação ou construção de edifícios semelhantes. Além disso, todos estes critérios deveriam ser alcançados sem renunciar à atualização do edifício de acordo com os padrões contemporâneos e ao cumprimento da legislação em vigor, incluindo a relativa à proteção contra incêndios.

A obra foi realizada sem alterar nenhuma das duas empenas, que tiveram de ser estabilizadas, e sem desmontar completamente a cobertura em nenhum momento. Isso permitiu conservar a imagem e o perfil característico das duas águas da barraca, bem como consultar

Diagram of the underpinning process for the lateral walls of the cottage | Esquema del proceso de recalce de los muros laterales de la barraca | Esquema do processo de reforço das paredes laterais da cabana (Cristina Ramos)

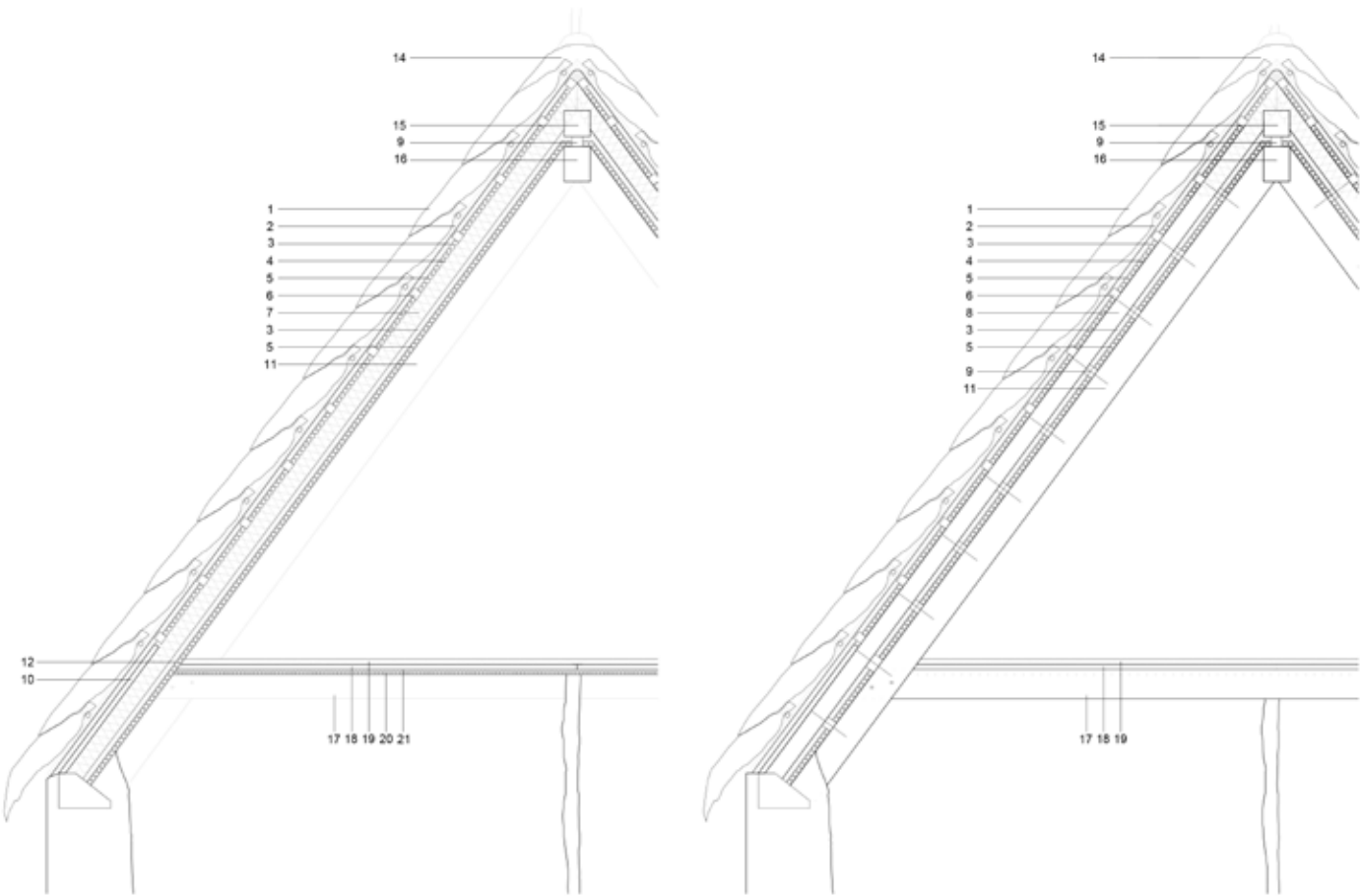


1: Process of exterior lining of the adobe walls—made of clay and rice straw—connected to the existing structure using cane notched in the form of a double harpoon and an earthen mortar enriched with lime 2: Layout of the wooden roof by the carpenter 3: Construction of the reed panel reinforced with canes 4: Application of the gypsum infill over the first reed layer of the roof slopes 5: Thatching process of the roof with bundles of marram grass 6: Detail of the roof thatching with bundles of marram grass | 1: Proceso de trasdosado exterior de los muros de adobe, fabricados con barro y paja de arroz, conectado al existente con cañas melladas en forma de arpón y con mortero de tierra enriquecido con cal 2: Replanteo de la cubierta de madera por el carpintero 3: Construcción del tablero de carrizo reforzado con cañas 4: Proceso de aplicado del rehenchido de yeso sobre el primer tablero de carrizo de los faldones de cubierta 5: Proceso de techado de la cubierta con haces de barrón 6: Detalle del techado de la cubierta con haces de barrón | 1: Processo de revestimento exterior das paredes de adobe, fabricadas com barro e palha de arroz, ligadas à estrutura existente com canas fendidas em forma de arpão e argamassa de terra enriquecida com cal 2: Marcação da cobertura de madeira pelo carpinteiro 3: Construção do painel de caniço reforçado com canas 4: Aplicação do enchimento de gesso sobre o primeiro painel de caniço das águas da cobertura 5: Processo de cobertura do telhado com feixes de carriço 6: Detalhe da cobertura do telhado com feixes de carriço (S: Rosaleny)

of the loft. Materials were stockpiled: adobe bricks were made with local earth and rice straw and, once dry, tested to determine their characteristic strength; common reed (*Phragmites australis*) was gathered for the roof panels, giant cane (*Arundo donax*) for reinforcing

momento. Esto permitió conservar la imagen y el perfil característico de los dos faldones inclinados de la barraca, así como consultar en todo momento las soluciones constructivas originales. Desde un primer momento, e incluso durante la redacción del proyecto, se

a qualquer momento as soluções construtivas originais. Desde o início, e mesmo durante a elaboração do projeto, foram contactados os ofícios especializados neste tipo de construções: fabricantes de adobe, segadores de gramíneas, telhadistas, carpinteiros de

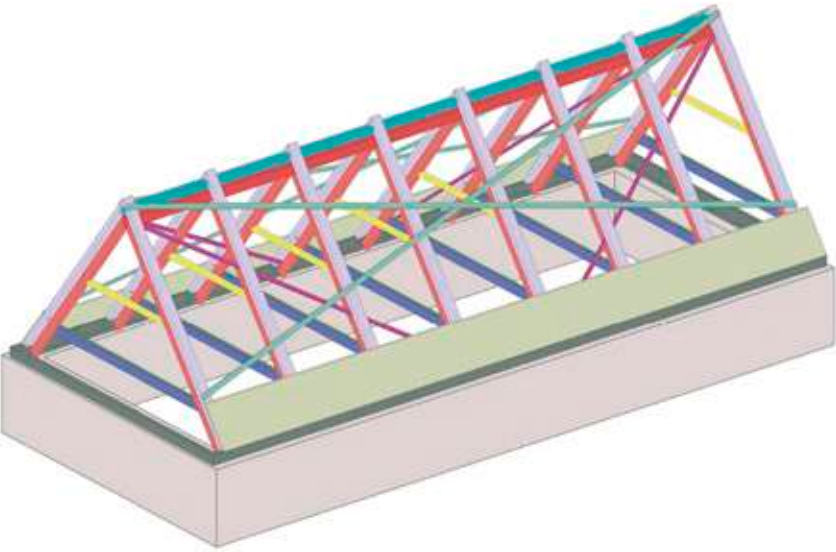


Roof sections with thermal, acoustic, and fire-resistant insulation placed in the space between the rafters and the overlaid rafters, joined together with lag screws | Secciones de la cubierta con aislamiento térmico, acústico e ignífugo intermedio alojado en el espacio entre los pares y los sobrepares, unidos entre sí con tirafondos a través de tarugos de madera | Secções da cobertura com isolamento térmico, acústico e ignífugo colocado no espaço entre os pares e os sobrepares, unidos entre si com parafusos através de cavilhas de madeira

ROOF 1: Thatch 2: Reed 3: Gypsum (3 cm) 4: Waterproofing 5: Reed (3 cm) 6: Wooden slat 7: Cork isolation 8: Timber overraffe 9: Wooden peg 10: Timber board 11: Timber rafter 12: Connecting band 13: Timber sleeper (24×22 cm) 14: Earth and lime 15: Ridge overbeam (15×15 cm) 16: Ridge beam (20×15 cm) **FLOOR** 17: Timber joist 18: Timber board (3 cm) 19: Gypsum beam 20: Reed 21: Gypsum (1 cm)

CUBIERTA 1: Paja 2: Caña 3: Yeso (3 cm) 4: Impermeabilización 5: Caña (3 cm) 6: Listón de madera 7: Aislamiento de corcho 8: Sobrepar de madera 9: Clavija de madera 10: Tabla de madera 11: Par de madera 12: Banda de unión 13: Durmiente de madera (24×22 cm) 14: Tierra y cal 15: Sobrecumbrera (15×15 cm) 16: Viga de cumbrera (20×15 cm) **FORJADO** 17: Vigueta de madera 18: Tabla de madera (3 cm) 19: Viga de yeso 20: Caña 21: Yeso (1 cm)

LAJE 1: Palha 2: Cana 3: Gesso (3 cm) 4: Impermeabilização 5: Cana (3 cm) 6: Sarrafo de madeira 7: Isolamento de cortiça 8: Sobrepar de madeira 9: Cavilha de madeira 10: Tábua de madeira 11: Par de madeira 12: Fita de união 13: Dormente de madeira (24×22 cm) 14: Terra e cal 15: Sobrecumeeira (15×15 cm) 16: Viga de cumeeira (20×15 cm) **FORRO** 17: Vigueta de madeira 18: Tábua de madeira (3 cm) 19: Viga de gesso 20: Cana 21: Gesso (1 cm)



Axonometric diagram of the new double roof structure of the cottage | Esquema axonométrico de la nueva estructura doble de la cubierta de la barraca | Esquema axonométrico da nova estrutura dupla da cobertura da cabana

the roof and the loft floor, and marram grass (*Ammophila arenaria*) for the roof thatch; and timber was sourced as needed to replace the woodwork that was irreparably damaged (Vegas and Mileto 2024).

The first task was to back up the old leaning adobe walls with similar adobe walling on the outer side, underpinned with a continuous footing of limecrete. The two walls were linked with cane notched in the form of a double harpoon, in a staggered pattern at 10 canes/m². The new wall was capped with a wooden top plate fastened with

contactó con los oficios especializados en este tipo de construcciones: fabricantes de adobe, segadores de gramíneas, techadores, carpinteros de armar, artesanos de la tierra y la cal para la pavimentación de la planta baja, y del yeso para la del altillo. Además, se acopiaron los materiales necesarios: se fabricaron adobes con barro local y paja de arroz, que una vez secos fueron ensayados para determinar su resistencia característica; se recolectaron el carrizo (*Phragmites australis*) para el tablero de cubierta, el cañizo (*Arundo donax*) para su refuerzo y el del forjado del altillo, y el barrón (*Ammophila arenaria*) para la cobertura vegetal; y se procuró la madera necesaria para sustituir la que estuviera irreparablemente dañada (Vegas y Mileto 2024).

armação, artesãos de terra e cal para o pavimento do rés-do-chão e do gesso para o do sótão. Além disso, foram reunidos os materiais necessários: foram fabricados adobes com barro local e palha de arroz, que, uma vez secos, foram testados para determinar a sua resistência característica; foi recolhido o caniço (*Phragmites australis*) para o tabuleiro da cobertura, a cana-vieira (*Arundo donax*) para o seu reforço e para a laje do sótão, e o carriço (*Ammophila arenaria*) para a cobertura vegetal; e foi adquirida a madeira necessária para substituir a que estava irremediavelmente danificada (Vegas e Mileto 2024).

The cottage after restoration, seen from the west | La barraca después de la intervención vista desde el oeste | A cabana depois da intervenção vista desde o oeste



pegs of the same material, on which the rafters were rested. The collar-beam structure was largely replaced owing to the termite infestation. Both the new timber and the reused pieces were treated to prevent further attack.

En primer lugar, se procedió a trasdosar los antiguos muros de adobes inclinados con muros de adobe de características similares por su cara exterior, apoyados sobre un recalde corrido de hormigón de cal. Ambos muros se conectaron mediante cañas melladas en forma de arpón doble, colocadas al tresbolillo, a razón de 10 cañas/m². El nuevo muro se coronó con un durmiente de madera fijado mediante clavijas del mismo material, sobre el que se recibieron los pares de la cubierta. La estructura de par y nudillo se sustituyó en gran parte debido a la grave afección por termitas. Tanto la madera nueva como la conservada se trataron para prevenir futuros ataques.

Em primeiro lugar, procedeu-se ao revestimento das antigas paredes inclinadas de adobe com paredes de adobe de características semelhantes na sua face exterior, apoiadas sobre um reforço contínuo das fundações feito de betão de cal. Ambas as paredes foram unidas por meio de canas lascadas em forma de arpão duplo, colocadas de forma escalonada, à razão de 10 canas/m². A nova parede foi coroada com uma travessa de madeira fixada com cavilhas do mesmo material, sobre a qual foram colocados os pares da cobertura. A estrutura de par y nudillo foi substituída em grande parte devido à grave infestação por térmitas. Tanto a madeira nova como a conservada foram tratadas para prevenir futuros ataques.

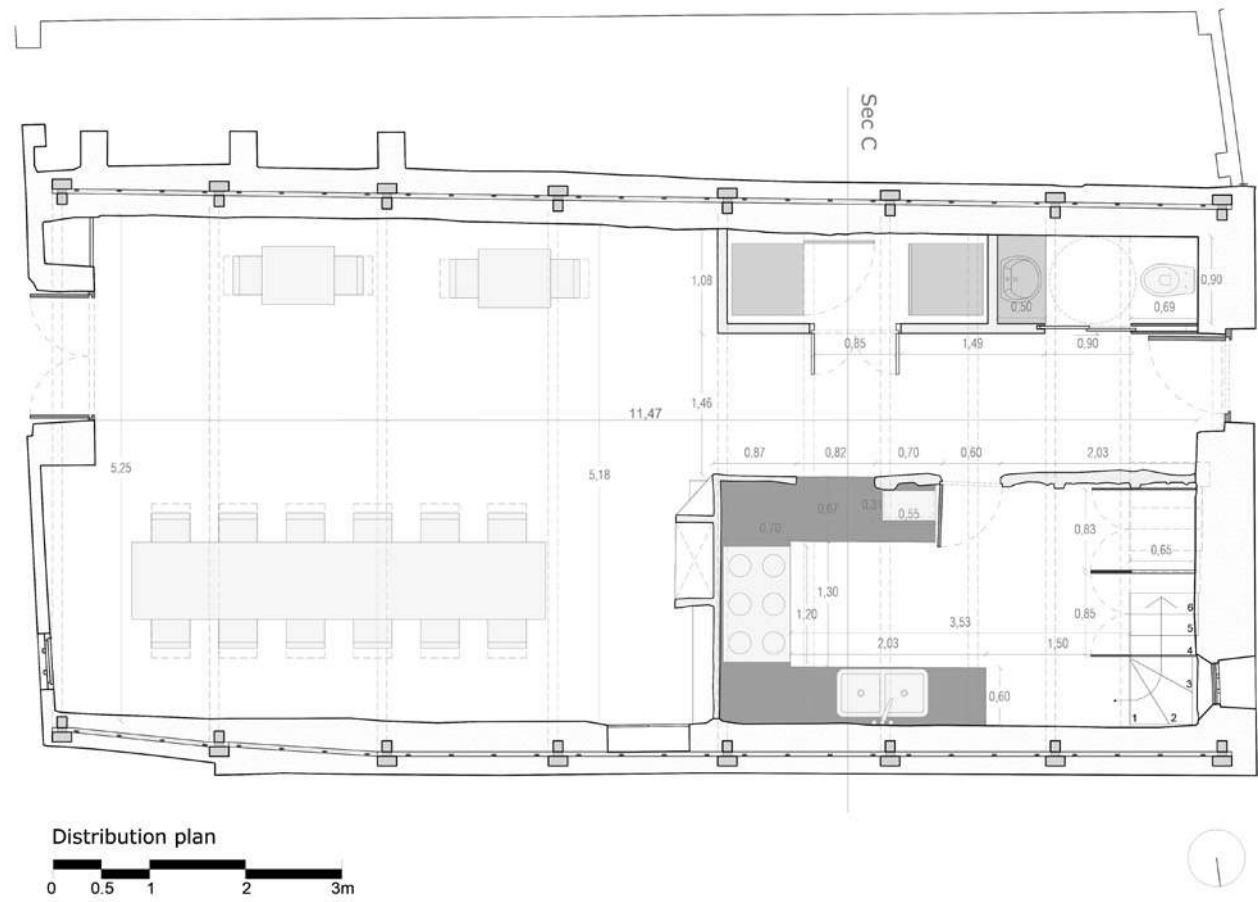
To comply with fire safety regulations, the rafters were reinforced using wooden pegs and overlaid rafters, interlinked with lag screws. The space between the main and overlaid rafters was filled with cane, 3 cm of gypsum plaster, a damp-proof membrane, and a 10 cm layer of natural cork. Over this, open-jointed planks were fitted with screws, more gypsum-plaster filling was applied, and the roof was thatched traditionally with bundles of the marram grass harvested previously. Doubling up the structure in this concealed manner, along with the intermediate layers of cork and plaster (natural materials with thermal, acoustic, and flame-retardant properties), ensures that any fire

Con el fin de cumplir la normativa contra incendios, los pares de cubierta se duplicaron mediante tarugos de madera y sobrepares, conectados entre sí con tirafondos. El espacio entre pares y sobrepares alojó el cañizo tradicional, un rehenchido de 3 cm de yeso, una lámina suplementaria de protección frente a la humedad y un estrato de 10 cm de corcho natural. Sobre este conjunto se atornilló un entablado de junta abierta, se aplicó un nuevo rehenchido de yeso y se techó la cubierta al modo tradicional con haces vegetales de barrón previamente cosechado. La duplicación de la estructura de madera de forma oculta, junto con los estratos intermedios de corcho y yeso –materiales naturales con propiedades

A fim de respeitar a legislação contra incêndios, os pares da cobertura foram duplicados através de cavilhas de madeira e sobrepares, ligados entre si com parafusos tira-fundo. O espaço entre os pares e os sobrepares alojou o tradicional caniço, um reboco de 3 cm de gesso, uma folha suplementar de proteção contra a humidade e uma camada de 10 cm de cortiça natural. Sobre este conjunto, foi aparafusado um tabuado com juntas espaçadas, aplicou-se um novo reboco de gesso e cobriu-se o telhado à maneira tradicional com feixes vegetais de carriço previamente colhido. A duplicação da estrutura de madeira de forma oculta, juntamente com as camadas intermédias de cortiça e gesso – materiais naturais

Floor plan of the cottage | Planta de distribución de la barraca | Planta de distribuição da cabana

1: Detail of the restored reed partition wall, plastered with clay and whitewashed with lime, dating from the 18th century 2: Interior of the cottage after restoration | 1: Detalle de la tabiquería restaurada de encañizado enlucida de barro y encalada de cal que data del siglo XVIII 2: Interior de la barraca después de la restauración | 1: Detalhe da divisória restaurada de caniço, rebocada com barro e caiada com cal, datada do século XVIII 2: Interior da cabana depois da restauração



outside would not get inside, and that in the event of an interior fire, this would not spread to the exterior, and that the structure would not collapse in either event.

The project was completed with the restoration of the wattle-and-daub partitions and interior joinery, both eighteenth century, along with the flooring, executed on the ground floor with earth and lime, burnished and waxed, and in the loft with waxed sanded gypsum plaster. A complete toilet was installed along with a catering kitchen fitted with professional appliances, fridges and hobs, taking advantage of the chimney and integrated unobtrusively into the cottage interior. The wiring for lighting, with wall lamps made of plaster, LED lights on the tie beams for ambient lighting, and spot lamps suspended from the ceiling, was run discreetly behind the cane.

The aim set at the outset—reclaiming the thatched *barraca* cottage, with its traditional form, materials, and techniques, as a valid architectural option for contemporary uses—was accomplished. The cottage is now in regular use as the headquarters and meeting venue of the cultural association, as well as serving as a museum in itself for the many visitors interested in experiencing this restored icon of Valencian heritage.

térmicas, acústicas e ignífugas—, garantiza que un incendio exterior no penetre en el interior y que, en caso de incendio interior, no se propague hacia el exterior, sin que colapse la estructura en ninguno de los dos supuestos.

La obra se completó con la restauración de la tabiquería encañizada de barro y de la carpintería interior, ambas del siglo XVIII, así como con la pavimentación, realizada con una solera de tierra y cal bruñida y encerada en la planta baja, y con un rehenchido de yeso lijado y encerado en el altillo. Se habilitó un aseo completo y una cocina de hostelería equipada con electrodomésticos, frigoríficos y fogones profesionales, que aprovechan el tiro de la chimenea y que se integran en el interior sin estridencias. El cableado del alumbrado, con lámparas de pared fabricadas en yeso, luces LED sobre los tirantes para conseguir una buena iluminación ambiental y focos suspendidos del tablero de cubierta, discurre de forma discreta tras las cañas.

El objetivo planteado desde un principio —reivindicar la barraca de cubierta vegetal, con su conformación, materiales y técnicas tradicionales, como opción arquitectónica válida para usos contemporáneos— se ha cumplido. La barraca se encuentra actualmente en pleno uso como sede y lugar de reunión de una asociación cultural, además de funcionar como museo de sí misma para los numerosos visitantes interesados en conocer este icono valenciano recuperado.

com propriedades térmicas, acústicas e ignífugas —, garante que um incêndio exterior não penetre no interior e que, em caso de incêndio interior, não se propague para o exterior, sem que a estrutura colapse em nenhum dos dois casos.

A obra foi concluída com a restauração das paredes divisórias de barro com canicado e da carpintaria interior, ambas do século XVIII, bem como com a pavimentação, realizada com um pavimento de terra e cal polida e encerada no rés-do-chão, e com um reboco de gesso lixado e encerado no sótão. Foi instalada uma casa de banho completa e uma cozinha profissional equipada com eletrodomésticos, frigoríficos e fogões profissionais, que aproveitam o tiro da chaminé e se integram no interior sem ruído. A instalação elétrica da iluminação, com candeeiros de parede em gesso, luzes LED sobre os tirantes para obter uma boa iluminação ambiente e focos suspensos do painel do teto, passa discretamente por trás das canas.

O objetivo estabelecido desde o início — revalorizar a cabana com cobertura vegetal, com a sua configuração, materiais e técnicas tradicionais, como opção arquitetónica válida para usos contemporâneos — foi alcançado. A cabana encontra-se atualmente em pleno uso como sede e local de reunião de uma associação cultural, além de funcionar como museu para os numerosos visitantes interessados em conhecer este ícone valenciano recuperado.

References | Referencias | Referências

Almela i Vives, Francisco. 1930. *The “barracas” (cottages) of Valencia*. Madrid: Patronato Nacional del Turismo.

Bellón Climent, Antonio. 2014. Las actividades económicas en El Palmar (Valencia): entre la tradición y la modernidad. *GeoGraphos: Revista Digital para Estudiantes de Geografía y Ciencias Sociales*, vol. 5, 64: 206-232.

Gosálvez, Víctor. 1998a. *La barraca valenciana: Valencia, 1915*. Valencia: Ícaro.

Gosálvez, Víctor. 1998b. *Causas económicas y sociales de la desaparición de la barraca de la huerta valenciana*. Valencia: Ícaro.

Michavila, Antonio. 1918. *La barraca valenciana: monografía geográfica*. Madrid: Imprenta del Patronato de huérfanos de intendencia é intervención militares.

Mileto, Camilla; Vegas, Fernando; Llatas, Carmen; y Soust-Verdaguer, Bernardette. 2021. A sustainable approach for the refurbishment process of vernacular heritage: The Sesga case study (Valencia, Spain). *Sustainability*, vol. 13, 9800: 13-39.

Rosselló i Verger, Vicenç Maria. 1995. *L'Albufera de València*. Barcelona: Publicacions de l'Abadia de Montserrat.

Sanchis Guarner, Manuel. 1957. *Les barraques valencianes*. Barcelona: Barcino.

Thede, Max. 1933. *L'albufera de València: Una descripció etnogràfica*. Valencia: Publicacions de la Universitat de València.

Vegas, Fernando; Mileto, Camilla. 2024. Restauració d'una barraca a l'Albufera de València. En Arnal Vidal, Tere; y Juan Segarra, Josep (eds.), *Barraques 2100. Passat, present i futur d'una arquitectura popular*, 129-154. Reus: Generalitat de Catalunya.

Biographies | Biografías | Biografias

Fernando Vegas

Fernando is an architect and has been visiting professor and lecturer at many Spanish and international universities. He has received various international awards for his work in the field of architectural restoration. He has worked, inter alia, on the Alhambra in Granada and Gaudí's Güell Pavilions in Barcelona. He is a Spanish member of the UNESCO Chair for Earthen Architecture and co-editor of the journal *Loggia*. He has edited numerous books and published articles, monographs, and essays on architectural heritage.

Fernando Vegas es arquitecto. Ha sido profesor visitante y ha impartido conferencias en numerosas universidades nacionales e internacionales. Ha recibido diversos premios internacionales por su labor en el ámbito de la restauración arquitectónica. Entre otros, ha trabajado en la Alhambra de Granada y la Finca Güell de Gaudí. Es socio español de la Cátedra UNESCO de Arquitectura de Tierra y codirector de la revista *Loggia*. Ha editado numerosos libros y publicado artículos, monografías y ensayos sobre patrimonio arquitectónico.

Fernando Vegas é arquiteto. Foi professor convidado e deu palestras em várias universidades nacionais e internacionais. Recebeu diversos prêmios internacionais pelo seu trabalho na área da restauração arquitetônica. Entre outros, trabalhou na Alhambra de Granada e na Finca Güell de Gaudí. É sócio espanhol da Cátedra UNESCO de Arquitetura de Terra e codiretor da revista *Loggia*. Editou vários livros e publicou artigos, monografias e ensaios sobre patrimônio arquitetônico.

Camila Mileto

Camilla is an architect and has lectured in Spain and abroad as well as receiving awards for her research and projects. She has participated actively in the preservation of earthen heritage and performed restoration projects on houses and monumental buildings such as castles, towers, or monasteries, as well as the Alhambra in Granada and Gaudí's Güell Pavilions in Barcelona. She is a Spanish member of the UNESCO Chair for Earthen Architecture and co-editor of the journal *Loggia*. She has edited numerous books and published articles and monographs on architectural heritage.

Camilla Mileto es arquitecta. Ha impartido conferencias a nivel nacional e internacional y ha recibido premios por sus investigaciones y trabajos. Ha participado activamente en la conservación del patrimonio de tierra y ha desarrollado proyectos de restauración en viviendas y edificios monumentales como castillos, torres, monasterios, además de en la Alhambra de Granada y la Finca Güell de Gaudí. Es socia española de la Cátedra UNESCO de Arquitectura de Tierra y codirectora de la revista *Loggia*. Ha editado numerosos libros y publicado artículos y monografías sobre patrimonio arquitectónico.

Camilla Mileto é arquiteta. Tem dado palestras a nível nacional e internacional e recebeu prêmios pelas suas investigações e trabalhos. Participou ativamente na conservação do património de terra e desenvolveu projetos de restauração em habitações e edifícios monumentais, como castelos, torres, mosteiros, além da Alhambra de Granada e da Finca Güell de Gaudí. É sócia espanhola da Cátedra UNESCO de Arquitetura de Terra e codiretora da revista. Editou vários livros e publicou artigos e monografias sobre património arquitetónico.



The Harsukh Complex in Lahore

El complejo Harsukh en Lahore

O complexo Harsukh em Lahore

The Harsukh Complex is located not far from the ever-expanding urban limits of Lahore. The complex was designed by the architect Kamil Khan Mumtaz and commissioned by Jawwad Khawaja and his wife Bina Jawwad as a family home for themselves and their four children. Built on expansive farmland forming part of the family estate, the ensemble embodies an intentional return to the region's vernacular tradition and stands in stark opposition to the aggressive expansion and industrialization that has transformed Lahore in recent decades. When Bina first asked Mumtaz to design a home for her family, she said she wanted an architecture that would not separate them from the land but would rather deepen that connection. For Bina

El complejo Harsukh no queda lejos de los límites de Lahore, una ciudad que sigue creciendo. El complejo fue proyectado por el arquitecto Kamil Khan Mumtaz por encargo de Jawwad Khawaja y su mujer, Bina Jawwad, como residencia familiar de la pareja y sus cuatro hijos. Construido en los extensos terrenos agrícolas que forman parte de la finca familiar, el conjunto es un ejemplo de retorno deliberado a la tradición vernácula de la zona en marcado contraste con la agresiva expansión e industrialización que ha transformado Lahore en las últimas décadas. Cuando Bina pidió a Mumtaz que proyectara una casa para la familia, le dijo que quería una arquitectura que no les separara de la tierra, sino que profundizara su conexión

Kamil Khan Mumtaz,
Hussain Ahmed

O complexo Harsukh está localizado não muito longe dos limites urbanos em constante expansão de Lahore. O complexo foi projetado pelo arquiteto Kamil Khan Mumtaz e encomendado por Jawwad Khawaja e sua esposa Bina Jawwad como uma casa familiar para eles e seus quatro filhos. Construído em terras agrícolas extensas que fazem parte da propriedade da família, o conjunto incorpora um retorno intencional à tradição vernacular da região e opõe-se fortemente à expansão agressiva e à industrialização que transformaram Lahore nas últimas décadas. Quando Bina pediu pela primeira vez a Mumtaz para projetar uma casa para a sua família, ela disse que queria uma arquitetura que não os separasse da terra, mas que, pelo

< East elevation of the residence's interior courtyard | Alzado este del patio interior de la residencia | Alçado nascente do pátio interior da residência (Rafay Anwar Creative Studios)

> Harsukh site photo | Foto del emplazamiento de Harsukh | Fotografia do local de Harsukh (Rafay Anwar Creative Studios)



this connection reflects an appreciation of her cultural heritage and a devotion to the traditions of her region of origin.

Kamil Khan Mumtaz’s approach to design here is rooted in a response to context. The project does not seek to impose an aesthetic foreign to the site but rather allows the aesthetic to emerge naturally as a result of an engagement with the various dimensions of the surroundings: physical, social, functional, material, historical, and spiritual. By systematically addressing the site’s particular constraints, the architect can deploy a methodology allowing architecture to emerge from the landscape in conformity with its setting.

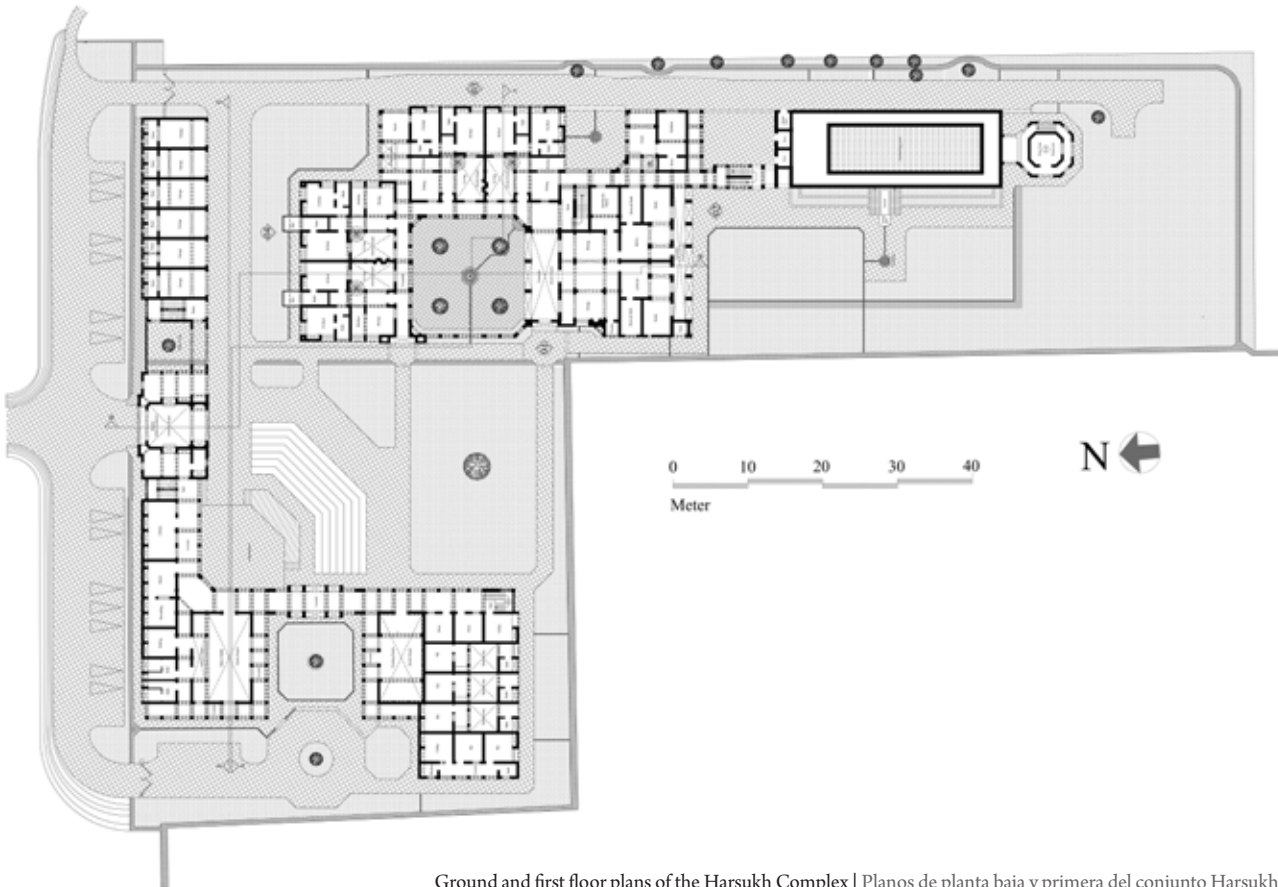
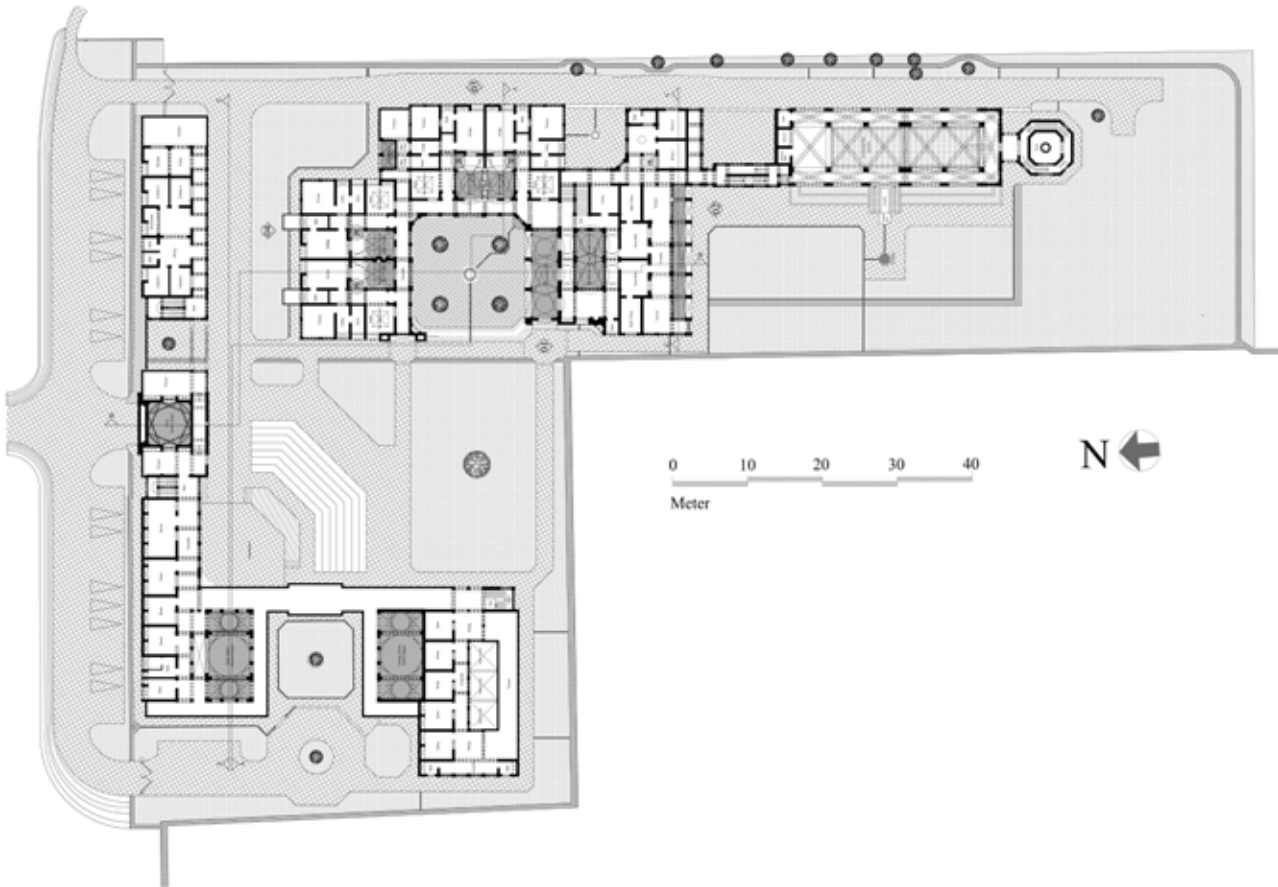
con ella. Para Bina, esta conexión refleja el aprecio por el patrimonio cultural y el apego a las tradiciones de su lugar de origen.

El planteamiento de Kamil Khan Mumtaz para este proyecto se basa en la respuesta al contexto. El proyecto no pretende imponer una estética ajena al lugar, sino que permite que la estética surja de manera natural como resultado de la interacción con las distintas dimensiones del entorno: físicas, sociales, funcionales, materiales, históricas y espirituales. Al abordar sistemáticamente las limitaciones específicas del emplazamiento, el arquitecto puede aplicar una metodología que consiga que la arquitectura surja del paisaje en consonancia con su entorno.

contrário, aprofundasse essa ligação. Para Bina, essa ligação reflete uma apreciação da sua herança cultural e uma devoção às tradições da sua região de origem.

A abordagem de Kamil Khan Mumtaz ao design assenta numa resposta ao contexto. O projeto não procura impor uma estética estranha ao local, mas sim permitir que a estética surja naturalmente como resultado de um envolvimento com as várias dimensões do ambiente: física, social, funcional, material, histórica e espiritual. Ao abordar sistematicamente as restrições específicas do local, o arquiteto pode implementar uma metodologia que permite que a arquitetura surja da paisagem em conformidade com o seu contexto.

Harsukh Complex, view towards the southwest | Conjunto Harsukh, vista hacia el suroeste | Conjunto Harsukh, vista para sudoeste (Rafay Anwar Creative Studios)



Ground and first floor plans of the Harsukh Complex | Planos de planta baja y primera del conjunto Harsukh | Plantas do rés-do-chão e do primeiro piso do conjunto Harsukh

Sections of the complex | Secciones del conjunto | Cortes do conjunto



Elevations of the complex | Alzados del conjunto | Alçados do conjunto



Main entrance to the residence | Acceso principal a la residencia | Entrada principal da residência
(Rafay Anwar Creative Studios)



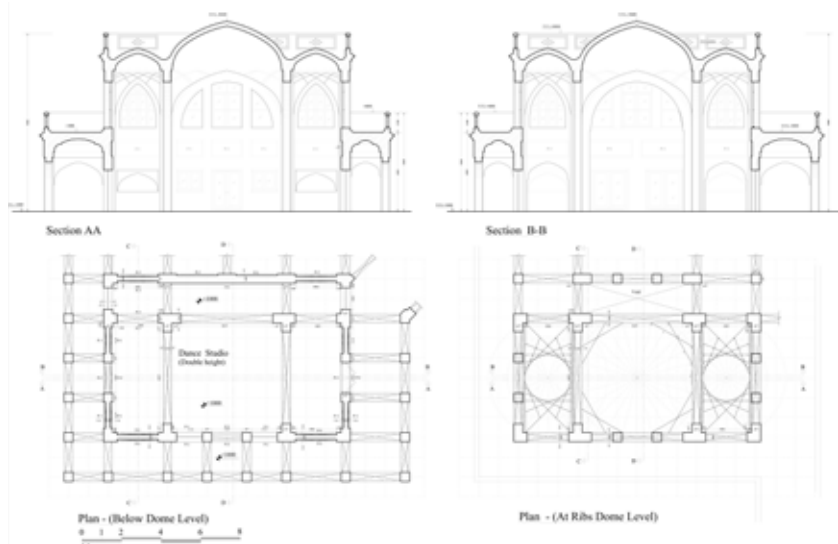
Main entrance to the complex | Acceso principal al conjunto | Entrada principal do conjunto



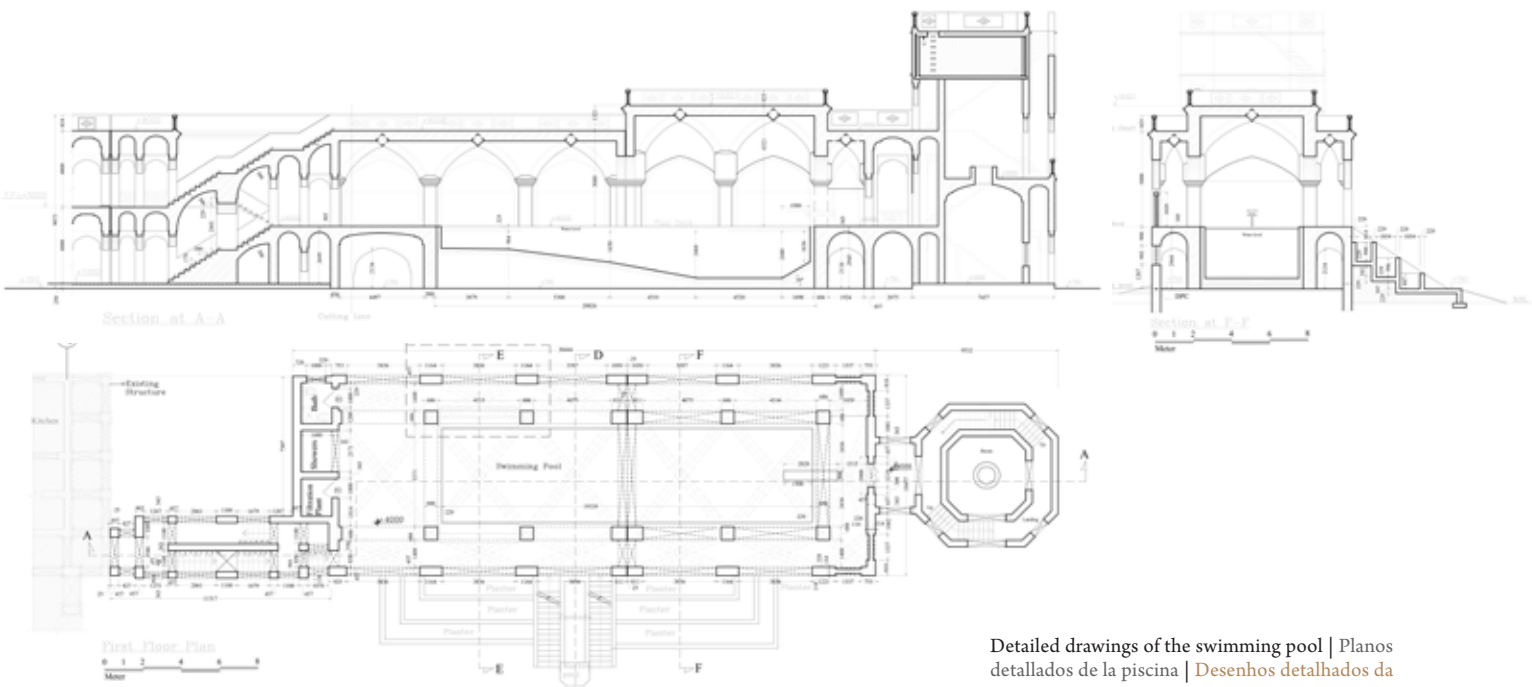
This sensitivity to context appears in Mumtaz’s planning of the Harsukh Complex, designed to accommodate both an extended family and an arts center. This dual purpose was the primary driver in the spatial planning, with a family home as well as dedicated spaces such as a studio and artists’ accommodation, a dance and theater

Esta sensibilidad al contexto queda patente en la manera en que Mumtaz ha planificado el Complejo Harsukh, pensado para alojar a una familia numerosa y albergar un centro de arte. Esta doble función fue el eje impulsor de la planificación espacial, con la vivienda familiar y los espacios dedicados a estudio y alojamiento de

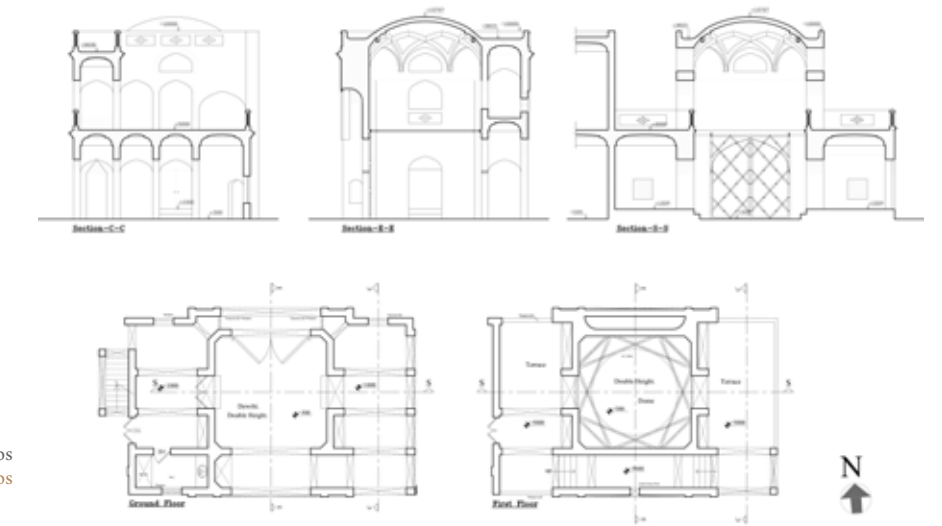
Esta sensibilidade ao contexto surge no planeamento de Mumtaz para o Complexo Harsukh, projetado para acomodar tanto uma família extensa como um centro de artes. Este duplo propósito foi o principal impulsionador do planeamento espacial, com uma casa familiar, assim como espaços dedicados, tais como um estúdio e alojamentos para artistas, um salão



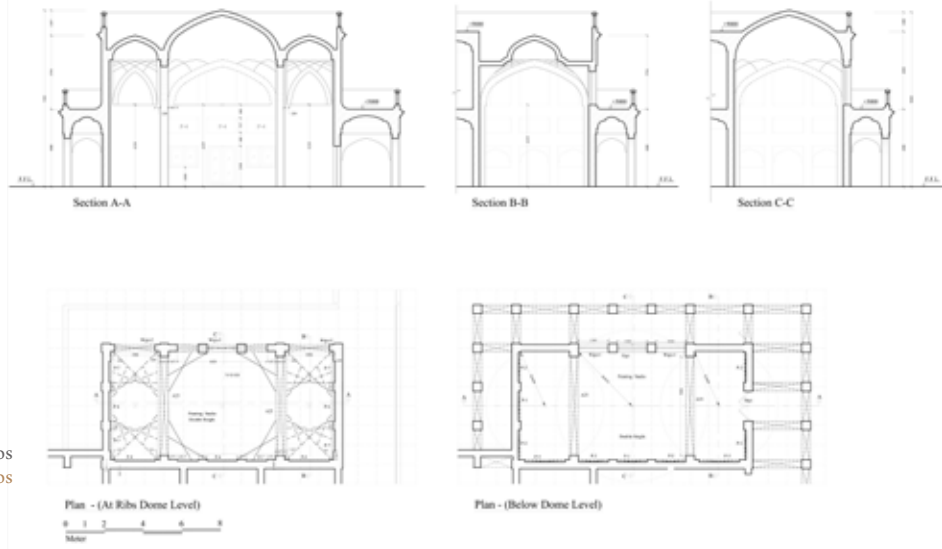
Detailed drawings of the dance studio | Planos detallados del estudio de danza | **Desenhos detalhados do estúdio de dança**



Detailed drawings of the swimming pool | Planos detallados de la piscina | **Desenhos detalhados da piscina**



Detailed drawings of the main entrance | Planos detallados del acceso principal | **Desenhos detalhados da entrada principal**



Detailed drawings of the painting studio | Planos detallados del estudio de pintura | **Desenhos detalhados do estúdio de pintura**

hall, a music facility, an open-air amphitheater, and an indoor swimming pool. The planning approach was to first separate public and private areas, with public structures such as the various studio spaces and the amphitheater situated at the west end of the complex, preventing the public from intruding into the family quarters, situated in the east wing behind dense vegetation that conceals them almost entirely. The home itself comprises three independent units arranged around a central courtyard. This features a fountain, two waterfalls, and rich greenery, serving as a gathering space, helping to regulate the microclimate within the dwellings, and reflecting the

artistas, una sala de teatro y danza, otra sala de música, un anfiteatro al aire libre y una piscina cubierta. La planificación consistió en separar primero las zonas públicas de las privadas; las estructuras de uso público, tales como los estudios y el anfiteatro, se situaron en el extremo occidental del complejo para impedir que el público invadiera las dependencias familiares. Estas están situadas en el ala oriental, tras una densa vegetación que las oculta casi por completo. La vivienda consta de tres unidades independientes dispuestas en torno a un patio central en el que hay una fuente, dos cascadas y vegetación exuberante, y que se utiliza como lugar de reunión. El patio ayuda a regular el microclima de la casa y refleja

de dança e teatro, instalações musicais, um anfiteatro ao ar livre e uma piscina coberta. A abordagem de planeamento consistiu em separar primeiro as áreas públicas e privadas, com estruturas públicas, como os vários estúdios e o anfiteatro, situadas na extremidade oeste do complexo, impedindo que o público invadissem os aposentos da família, situados na ala leste, atrás de uma vegetação densa que os oculta quase totalmente. A casa em si é composta por três unidades independentes dispostas em torno de um pátio central. Este contém uma fonte, duas cascatas e uma vegetação rica, servindo como um espaço de convívio, ajudando a regular o microclima dentro das habitações e refletindo o tipo de mansão

type of a traditional *haveli* mansion with natural lighting and cooling while also allowing for family privacy.

This layout consisting of multiple residential units around a single courtyard is a common type in the region, often allowing a succession of family generations to live together, letting the young benefit from the wisdom and experience of their elders. The dedicated spaces provided for artistic and cultural activities also allows for the transmission of these traditions.

el tipo de mansión tradicional *haveli*, con iluminación y ventilación naturales, al tiempo que proporciona intimidad a la familia.

Esta disposición de varias viviendas en torno a un patio es habitual en la zona, permite que varias generaciones de la misma familia convivan y que los más jóvenes se beneficien de la sabiduría y la experiencia de sus mayores. Asimismo, los espacios dedicados a las actividades culturales y artísticas permiten transmitir estas tradiciones.

tradicional *haveli* com iluminação e arrefecimento naturais, ao mesmo tempo que permite a privacidade da família.

Este layout, composto por várias unidades residenciais em torno de um único pátio, é comum na região, permitindo frequentemente que várias gerações da mesma família vivam juntas, para que os mais jovens possam beneficiar da sabedoria e experiência dos mais velhos. Os espaços dedicados a atividades artísticas e culturais também permitem a transmissão dessas tradições.



Construction of the east elevation and the north courtyard elevation of the residence | Construcción del alzado este y del alzado norte del patio de la residencia | Construção do alçado nascente e do alçado norte do pátio da residência



Construction of a staircase and a corridor | Construcción de una escalera y un corredor | Construção da escada e do corredor

During construction, Mumtaz prioritized the use of local building materials that are not only abundant in the region but also particularly suitable. This involved relying on pre-modern building methods, namely the use of ribbed domes and vaulted ceilings for spans within the structure. While ribbed domes allow a large area to be spanned, vaulted ceilings permit the building of an additional floor above without the use of conventional steel reinforcements. For the interior, the application of *pukka kali*, a highly polished lime plaster, showcases another traditional technique uniquely suited to the region's climate. Due to its inherent ability to retain moisture without compromising the structure, the use of *pukka kali* allows the walls to breathe and to regulate the interior temperature.

En la construcción, Mumtaz dio prioridad al uso de materiales locales que, además de abundar en la zona, son especialmente adecuados. Esta decisión conllevó el uso de métodos de construcción premodernos, sobre todo de cúpulas nervadas y techos abovedados para los vanos de la estructura. Mientras que las cúpulas nervadas permiten cubrir una gran superficie, los techos abovedados permiten construir una planta alta sin tener que utilizar refuerzos de acero convencionales. En el interior, la aplicación de *pukka kali*, un mortero de cal muy pulido, presenta otra técnica tradicional especialmente adecuada para el clima de la región. Gracias a su capacidad intrínseca para retener la humedad sin poner en peligro la estructura, el uso de *pukka kali* permite que los muros respiren y se regula la temperatura ambiente.

Durante a construção, Mumtaz deu prioridade ao uso de materiais de construção locais que não só são abundantes na região, mas também particularmente adequados. Isso envolveu o recurso a métodos de construção pré-modernos, nomeadamente o uso de cúpulas com nervuras e abóbadas para os vãos da estrutura. Enquanto as cúpulas com nervuras permitem abranger uma grande área, as abóbadas permitem a construção de um piso superior adicional sem recurso aos reforços de aço convencionais. No interior, a aplicação de *pukka kali*, um reboco de cal altamente polido, mostra outra técnica tradicional especialmente adequada ao clima da região. Devido à sua capacidade inerente de reter a humidade sem comprometer a estrutura, o uso de *pukka kali* permite que as paredes respirem e regulem a temperatura interior.



1



2



3

Due to the project’s unconventional nature, it was marked by a spirit of experimentation, turning the site into what could be described as an open-air laboratory. Such research and development on site was possible thanks to the clients’ own enthusiasm—a rare commitment allowing for an exploration of the traditional building techniques to

Dada la naturaleza nada convencional del proyecto, éste ha estado marcado por el ánimo de experimentar, por lo que la obra podría describirse como un laboratorio a cielo abierto. La investigación y el desarrollo sobre el terreno fueron posibles gracias al entusiasmo de los clientes, un compromiso nada habitual que permitió explorar las técnicas de construcción



4



5

1, 2: Construction of the vaulted ceiling 3: Construction of the domes 4, 5: Construction of the *muqarnas* | 1, 2: Construcción del techo abovedado 3: Construcción de las cúpulas 4, 5: Construcción de los mocárabes | 1, 2: Construção do teto abobadado 3: Construção das cúpulas 4, 5: Construção dos *muqarnas*

Devido à natureza não convencional do projeto, ele foi marcado por um espírito de experimentação, transformando o local no que poderia ser descrito como um laboratório ao ar livre. Esta pesquisa e desenvolvimento no local foram possíveis graças ao entusiasmo dos próprios clientes — um compromisso raro que permitiu a exploração das técnicas tradicionais de

be used throughout. The construction of the ribbed dome and vaulted ceiling was especially challenging at first, but after many attempts, the engineers, Rizwan Qadeer and Shahid Niaz, were able to refine the process so that the masons no longer needed to rely on prefabricated formwork to guide the bricklaying. Instead they were able to follow the geometric form embedded in the structure. Owing to the slow setting of the lime mortar used to bind the bricks, the domes took much longer to build than they would have with conventional concreting, but the aesthetic and functional outcome was well worth the wait.

tradicionales que se utilizaron de principio a fin del proyecto. La construcción de la cúpula nervada y el techo abovedado planteó grandes dificultades al principio, pero tras numerosos intentos, los ingenieros Rizwan Qadeer y Shahid Niaz perfeccionaron el proceso de manera que los albañiles no necesitaran utilizar encofrados prefabricados como guía, sino que pudieron seguir la forma geométrica integrada en la estructura. Debido al lento fraguado del mortero de cal utilizado para unir los ladrillos, la construcción de las cúpulas llevó mucho más tiempo del que se habría necesitado con el hormigonado convencional, pero el resultado estético y funcional hizo que la espera mereciera la pena.

construção a serem utilizadas em todo o projeto. A construção da cúpula com nervuras e da abóbada foi especialmente desafiante no início, mas após muitas tentativas, os engenheiros Rizwan Qadeer e Shahid Niaz conseguiram refinar o processo para que os pedreiros não mais dependessem de cofragens pré-fabricadas para orientar o assentamento de tijolos. Em vez disso, eles puderam seguir a forma geométrica incorporada na estrutura. Devido à lentidão na colocação da argamassa de cal que foi usada para unir os tijolos, as cúpulas demoraram muito mais tempo a serem construídas do que teriam demorado com o betão convencional, mas o resultado estético e funcional justificou a espera.

Ribbed dome | Cúpula nervada | Cúpula nervurada





Other more historical attributes of the building include *muqarnas*, intricate ornamental vaulting reproducing the complex geometric patterns in the overall form. *Muqarnas* appear in the family home at the corners of the ribbed domes over the double-height spaces. The complex also includes other details such as the *sorahi daat* (four-pointed arch), *bersati jali* (latticework terracotta screen), *jharokha* (overhanging enclosed balcony), *shahnasheen* (elongated gallery), and *baradari* (open pavilion). These individual elements are brought together by Mumtaz in a manner consistent with the region's long architectural tradition. His designs reinterpret and adapt historical

Otras características históricas del edificio son los *muqarnas* (mocárabes), un intrincado ornamento para las bóvedas que reproduce complicados dibujos geométricos por toda la superficie. Estos *muqarnas* aparecen en las esquinas de las cúpulas nervadas sobre los espacios de doble altura de la vivienda familiar. El complejo presenta otros detalles como el *sorahi daat* (arco de cuatro centros), la *bersati jali* (celosía de terracota), el *jharokha* (mirador en voladizo), la *shahnasheen* (galería alargada), y el *baradari* (pabellón abierto). Mumtaz reúne estos elementos en coherencia con la larga tradición arquitectónica de la región. En sus proyectos reinterpreta y adapta al presente las formas y las técnicas

Outros atributos mais históricos do edifício incluem *muqarnas*, abóbadas ornamentais intrincadas que reproduzem os padrões geométricos complexos na forma geral. as *muqarnas* surgem na casa da família nos cantos das cúpulas com nervuras sobre os espaços de pé-direito duplo. O complexo também inclui outros detalhes, como *sorahi daat* (arco de quatro centros), *bersati jali* (painéis de terracota em treliça), *jharokha* (balcão fechado saliente), *shahnasheen* (galeria alongada) e *baradari* (pavilhão aberto). Esses elementos individuais são reunidos por Mumtaz em conformidade com a longa tradição arquitetônica da região. Os seus designs reinterpretam e adaptam formas e técnicas históricas para o presente,

Amphitheatre | Anfiteatro | Anfiteatro



North-side corridor and west elevation of the amphitheatre area | Corredor norte y alzado oeste del área del anfiteatro | Corredor norte e alçado poente da zona do anfiteatro (Rafay Anwar Creative Studios)





forms and techniques for the present, reflecting an approach that seeks to engage with tradition in a contemplative manner.

The Harsukh Complex represents the architect's most significant departure from the modernist worldview that previously characterized his work. His engagement with Nader Ardalan and Laleh Bakhtiar's *The Sense of Unity: The Sufi Tradition in Persian Architecture* prompted him to consider more closely the immaterial aspects of design. Through his architecture Mumtaz has come to advocate for an awareness of a spiritual order reflecting a broader interaction between the

del pasado. Son reflejo de un método que busca relacionarse con la tradición de manera contemplativa.

El Complejo Harsukh supone el alejamiento más importante del arquitecto respecto a la visión modernista del mundo que había caracterizado su trabajo hasta ahora. La lectura profunda de *El sentido de la unidad: La tradición sufi en la arquitectura persa*, de Nader Ardalan y Laleh Bakhtiar, le hizo considerar con mayor detenimiento los aspectos inmateriales del proyecto. A través de su arquitectura, Mumtaz promueve el conocimiento de un orden espiritual que refleje una interacción más amplia entre lo material y lo divino.

refletindo uma abordagem que procura envolver-se com a tradição de uma forma contemplativa.

O complexo Harsukh representa o afastamento mais significativo do arquiteto da visão de mundo modernista que anteriormente caracterizava o seu trabalho. O seu envolvimento com a obra de Nader Ardalan e Laleh Bakhtiar, *The Sense of Unity: The Sufi Tradition in Persian Architecture* (*O Sentido da Unidade: A Tradição Sufista na Arquitetura Persa*), levou-o a considerar mais de perto os aspetos imateriais do design. Através da sua arquitetura, Mumtaz passou a defender a consciência de uma ordem espiritual que reflete uma interação mais

< North and east elevations of the residence's interior courtyard | Alzados norte y este del patio interior de la residencia | Alçados norte e nascente do pátio interior da residência (Rafay Anwar Creative Studios)

> East elevation of the residence | Alzado este de la residencia | Alçado nascente da residência (Rafay Anwar Creative Studios)



material and the divine. This is perhaps most manifest in the transformative experience many visitors have had upon experiencing the traditional forms and design of the Harsukh Complex. In conclusion, this project stands as an example of Mumtaz’s ability to produce an architecture that weaves together aspects of its context so as to root itself in place and time. While the ensemble draws heavily upon the past it remains eminently contemporary.

Quizás esto se note de manera más palpable en la transformación que viven muchos visitantes al experimentar las formas y los diseños tradicionales del complejo Harsukh. Para concluir, este proyecto sobresale como ejemplo de la capacidad de Mumtaz para producir una arquitectura que entreteje aspectos de su contexto para echar raíces en el lugar y el tiempo. Si bien el conjunto se inspira en gran medida en el pasado, es eminentemente contemporáneo.

ampla entre o material e o divino. Isso talvez seja mais evidente na experiência transformadora que muitos visitantes tiveram ao conhecer as formas e o design tradicionais do complexo Harsukh. Em conclusão, este projeto é um exemplo da capacidade de Mumtaz de produzir uma arquitetura que combina diferentes aspectos do seu contexto de forma a enraizar-se no lugar e no tempo. Embora o conjunto se baseie fortemente no passado, continua a ser eminentemente contemporâneo.



Swimming pool | Piscina | Piscina



Construction details | Detalles constructivos | Detalhes construtivos (Rafay Anwar Creative Studios)

References | Referencias | Referências

Ardalan, Nader; and Bakhtiar, Laleh. 2000. *Sense of Unity: The Sufi Tradition in Persian Architecture*. Abjad Book Designers and Builders.

Biographies | Biografías | Biografias

Kamil Khan Mumtaz

As a practicing architect, educator, author, and pioneer in the movement for conservation of architectural heritage, he has had vital influence in raising standards of architectural design in general and in the search for a contemporary, appropriate architecture for Pakistan responsive to climate and economic and material considerations and yet rooted in indigenous culture.

Como arquitecto en ejercicio, educador, autor y pionero en el movimiento para la conservación del patrimonio arquitectónico, Mumtaz ha tenido una influencia fundamental en la mejora del nivel de los proyectos arquitectónicos en general y en la búsqueda de una arquitectura contemporánea adecuada para Pakistán, que responda a las consideraciones climáticas, económicas y materiales, pero que al mismo tiempo esté arraigada en la cultura autóctona.

Como arquiteto, educador, autor e pioneiro no movimento pela conservação do património arquitetónico, teve uma influência vital no estabelecimento de padrões mais elevados de design arquitetónico em geral, e na busca por uma arquitetura contemporânea e adequada para o Paquistão, sensível às considerações climáticas, económicas e materiais, mas ainda assim enraizada na cultura indígena.

Hussain Ahmed

Currently taking a master’s degree in advanced architecture at the Frankfurt University of Applied Sciences. He joined the office of Kamil Khan Mumtaz in 2020 as a junior architect and research assistant. As a researcher he has assisted Mumtaz in developing a course at the Beaconhouse National University called “Tradition and Modernity”.

Actualmente cursa un máster en arquitectura avanzada en la Universidad de Ciencias Aplicadas de Frankfurt. Se incorporó al estudio de Kamil Khan Mumtaz en 2020 en calidad de arquitecto junior y ayudante de investigación. Como investigador ha ayudado a Mumtaz a preparar un curso sobre “Tradición y Modernidad” para la Universidad Nacional Beaconhouse.

Atualmente, está a fazer um mestrado em arquitetura avançada na Universidade de Ciências Aplicadas de Frankfurt. Em 2020, passou a fazer parte do escritório de Kamil Khan Mumtaz como arquiteto júnior e assistente de investigação. Como investigador, ajudou Mumtaz a desenvolver um curso na Universidade Nacional Beaconhouse chamado «Tradição e Modernidade».



Kim Won-cheon

*Two Contemporary Hanoks Embracing Tradition and Modern Life:
Myeonglinheon and Sugyeongjae*

*Dos hanoks contemporáneos que aúnan tradición y vida moderna:
Myeonglinheon y Sugyeongjae*

*Duas hanoks contemporâneas que abraçam a tradição e a vida moderna:
Myeonglinheon e Sugyeongjae*

Myeonglinheon:
A Contemporary Hanok Embracing Tradition and Modern Life

Context and Site

Located in Eunpyeong Hanok Village, Myeonglinheon is at the threshold between bustling commercial streets and quiet residential fabric. A visitor begins by leaving the noise of Seoul behind and following an alley that gently descends to where a curved wall capped with roof tiles subtly invites us

Myeonglinheon:
Un hanok contemporáneo que aúna tradición y vida moderna

Contexto y ubicación

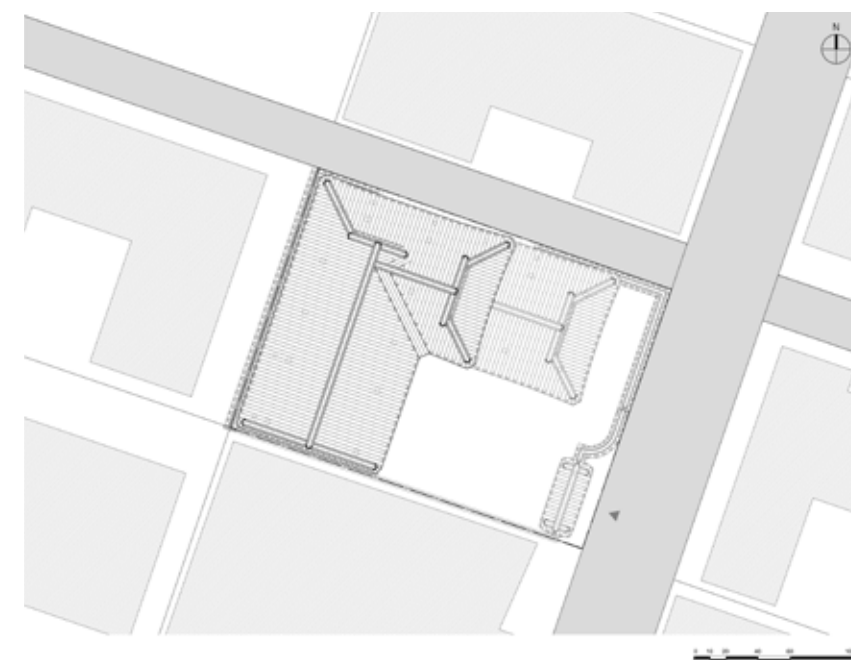
Situado en Eunpyeong Hanok Village, Myeonglinheon está en el límite entre las bulliciosas calles comerciales y el tranquilo tejido residencial. Dejamos atrás el ruido de Seúl y seguimos por un callejón que desciende suavemente hasta un muro curvado coronado con tejas que nos invita a entrar de manera sutil. Este

Myeonglinheon:
Uma Hanok contemporânea que abraça a tradição e a vida moderna

Contexto e local

Localizada na aldeia Hanok de Eunpyeong, Myeonglinheon fica na fronteira entre ruas comerciais movimentadas e uma área residencial tranquila. O visitante começa por deixar para trás o barulho de Seul e segue por um beco que desce suavemente até onde uma parede curva coberta com telhas nos convida subtilmente a entrar.

< View from the second floor veranda of the Myeonglinheon | Vista desde el balcón del segundo piso del Myeonglinheon | Vista da varanda do segundo andar do Myeonglinheon
> Site Plan of the Myeonglinheon | Plano de situación del Myeonglinheon | Planta do local do Myeonglinheon



in. This wall is an architectural and also a cultural gesture, embodying the hanok tradition of guiding our movements and gaze. Once the gate opens, the visitor finds an expansive courtyard, a rarity in uptown Seoul. The L-shaped house, strategically placed at the site's northwest corner, opens wide to the southeast, making the most of natural light.

muro es a la vez un gesto arquitectónico y cultural; representa la tradición del hanok, que guía nuestros movimientos y miradas. Cuando se abre la puerta, el visitante encuentra un amplio patio, una rareza en el centro de Seúl. La casa, en forma de L y situada estratégicamente en la esquina noroeste del terreno, se abre al sureste para aprovechar al máximo la luz natural.

Essa parede é um gesto arquitectónico e também cultural, incorporando a tradição Hanok de guiar os nossos movimentos e o nosso olhar. Assim que o portão se abre, o visitante encontra um pátio amplo, uma raridade na zona alta de Seul. A casa em forma de L, estrategicamente localizada no canto noroeste do terreno, abre-se amplamente para sudeste, aproveitando ao máximo a luz natural.



1: Render of the Myeonglinheon 2: Exterior view of the Myeonglinheon | 1: Render del Myeonglinheon 2: Vista exterior del Myeonglinheon | 1: Render do Myeonglinheon 2: Vista externa do Myeonglinheon



Courtyard | Patio | Pátio

Spatial Composition

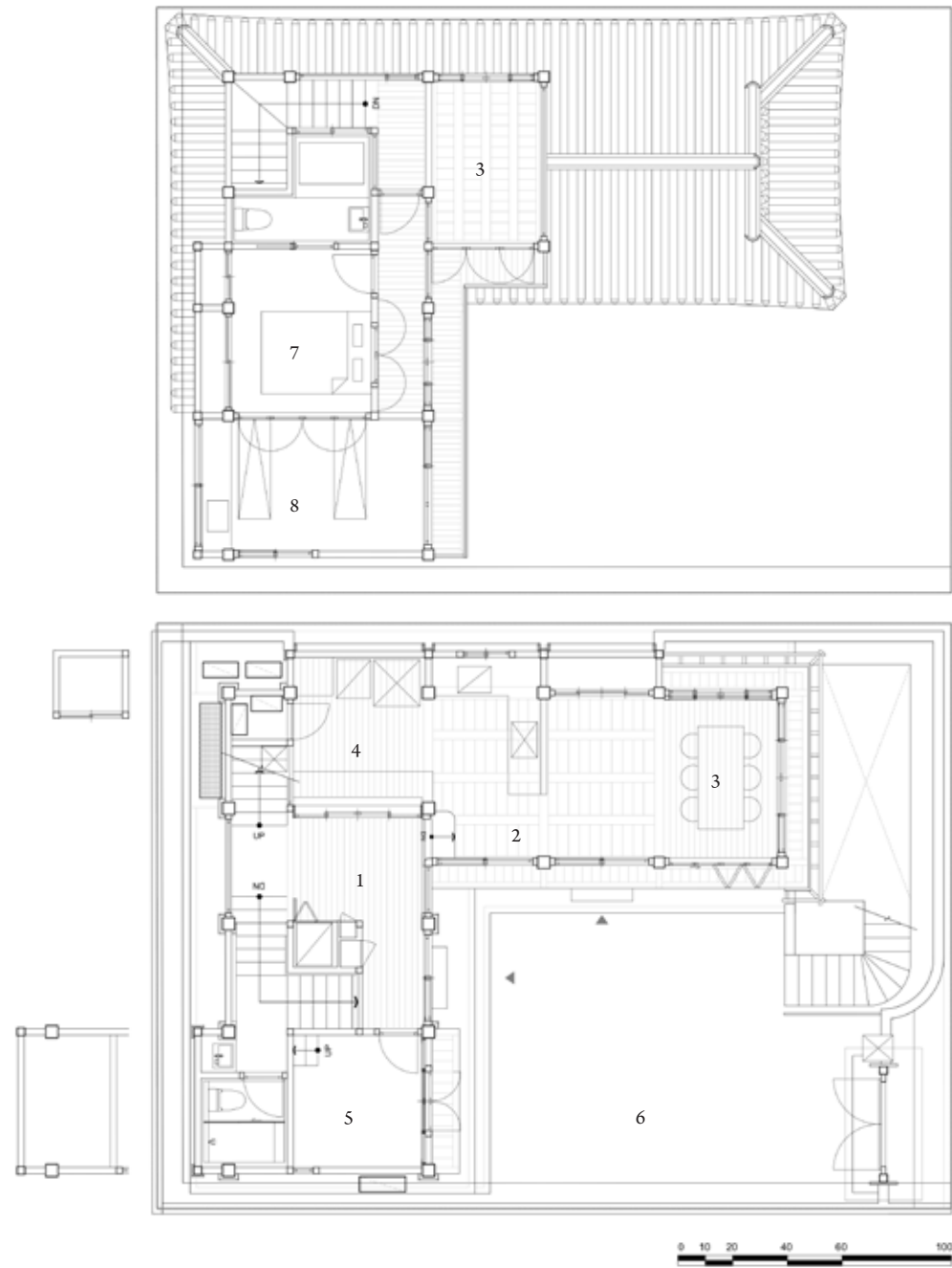
Myeonglinheon is organized over three levels: basement, ground, and upper floor. Each floor expresses a different layer of the hanok's dual nature—communal openness and private intimacy. The first floor is a modern reinterpretation of the *sarangchae* (quarters traditionally for men). A central *daecheong* hall (traditionally for performing ancestral rites) along with the adjacent kitchen and *numaru* (raised veranda) create an open, hospitable sequence for cooking, tea, and conversation. Instead of a fixed entry hall, the visitor finds stepping stones up to a sliding wooden door, and instinctively steps onto a side platform leading to the *daecheong*. This choreography reflects the hanok's characteristic informality and invitingness. A guestroom, lined with *hanji* paper, offers shelter to overnight visitors.

Composición espacial

Myeonglinheon está organizado en tres niveles: sótano, planta baja y planta alta. Cada planta expresa una capa distinta de la naturaleza dual del hanok: apertura al uso comunitario e intimidad. La primera planta es una reinterpretación actualizada del *sarangchae* (aposentos reservados tradicionalmente a los hombres). Un salón central *daecheong* (usado tradicionalmente para celebrar ritos ancestrales) junto con la cocina adyacente y el *numaru* (porche elevado) crean una secuencia abierta y acogedora para cocinar, tomar el té y charlar. En lugar de un vestíbulo de entrada fijo, el visitante encuentra un camino enlosado que conduce a una puerta corredera de madera e instintivamente sube a la plataforma lateral que lleva al *daecheong*. Esta coreografía refleja el carácter informal y acogedor del hanok. Una habitación de invitados, revestida con papel *hanji*, alberga a los visitantes que pernoctan.

Composição espacial

Myeonglinheon está organizado em três níveis: cave, rés-do-chão e piso superior. Cada piso expressa uma camada diferente da natureza dual da Hanok — abertura comunitária e intimidade privada. O primeiro piso é uma reinterpretção moderna do *sarangchae* (alojamentos tradicionalmente destinados aos homens). Um salão central *daecheong* (tradicionalmente destinado à realização de rituais ancestrais), juntamente com a cozinha adjacente e o *numaru* (varanda elevada), criam uma sequência aberta e hospitaleira para cozinhar, tomar chá e conversar. Em vez de um hall de entrada fixo, o visitante encontra um caminho de pedras que conduzem a uma porta de madeira deslizante e, instintivamente, chega a uma plataforma lateral que leva ao *daecheong*. Esta coreografia reflete a informalidade e o carácter convidativo característicos da Hanok. Um quarto de hóspedes, revestido com papel *hanji*, oferece abrigo aos visitantes que pernoitam.



Ground and first floors plans. Legend: 1-Small hall 2-Main floor hall 3-Verandah 4-Kitchen 5-Room 6-Garden 7-Bedroom 8-Living room | Planos de la planta baja y primer piso. Leyenda: 1-Sala pequeña 2-Sala principal 3-Veranda 4-Cocina 5-Habitación 6-Jardín 7-Dormitorio 8-Salón | Plantas do térreo e primeiro andar. Legenda: 1-Sala pequena 2-Sala principal 3-Varanda 4-Cozinha 5-Quarto 6-Jardim 7-Dormitório 8-Sala de estar

The second floor houses the private quarters, akin to the traditional *anchae* (women's suite). The master bedroom is carefully enveloped: a corridor in front, a storeroom behind, and a bathroom and living room on either side. This arrangement creates cocoon-like comfort while remaining open to the spectacular exterior. Viewed from the *numaru* and terrace, Mount Bukhansan dominates the horizon, offering release from the city and spaciousness. The layering of privacy is intentional: only by climbing the stairs and passing

En la segunda planta están las habitaciones privadas, similares a los tradicionales *anchae* (suite de las mujeres). La habitación principal está protegida cuidadosamente: un pasillo por delante, un vestidor por detrás y, a los lados, un baño y una sala de estar. Esta distribución crea un ambiente confortable y protector, sin dejar de estar abierta al exterior espectacular. Desde el *numaru* y la terraza, el Monte Bukhansan domina el horizonte, y su inmensidad ayuda a olvidar la ciudad. Esta distribución es deliberada en aras de la privacidad: tan

No segundo andar encontram-se os aposentos privados, semelhantes ao tradicional *anchae* (suite feminina). O quarto principal é cuidadosamente envolvido: um corredor à frente, uma arrecadação atrás e uma casa de banho e sala de estar em ambos os lados. Esse arranjo cria um conforto semelhante a um casulo, ao mesmo tempo que se mantém a abertura para o exterior espetacular. Visto do *numaru* e do terraço, o Monte Bukhansan domina o horizonte, oferecendo um escape da cidade e amplitude. A estratificação da privacidade

through transitional corridors does one arrive at this serene retreat.

The basement is a modern layer, offering what old hanoks often lacked: an ample, flexible living room. Excavated deep into the site, it allows the owners to listen to music, watch films, or practice instruments in a sound-insulated space. This adaptation demonstrates how tradition and contemporary lifestyle may coexist.



Building process | Proceso de construcción | Processo de construção

solo al subir las escaleras y recorrer los pasillos se llega a este oasis de sosiego.

El sótano es un espacio moderno que ofrece algo de lo que carecían los antiguos hanoks: un salón amplio de uso polivalente. Excavado a gran profundidad, en este espacio los propietarios pueden oír música, ver películas o ensayar en un espacio insonorizado. Esta adaptación demuestra que es posible la coexistencia de tradición y estilo de vida moderno.

é intencional: só subindo as escadas e passando por corredores de transição é que se chega a este refúgio sereno.

A cave é uma camada moderna, oferecendo o que muitas vezes faltava nas antigas Hanoks: uma sala de estar ampla e flexível. Escavada nas profundezas do local, permite aos proprietários ouvir música, ver filmes ou tocar instrumentos num espaço com isolamento acústico. Esta adaptação demonstra como a tradição e o estilo de vida contemporâneo podem coexistir.

Design Intentions

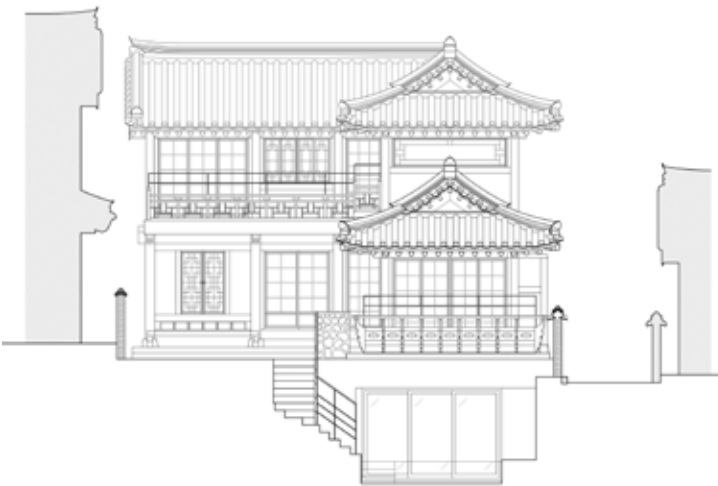
The house is defined not only by its spatial sequence but also by its details. Along with simple white walls and neat timber joinery, there are touches of surprise and intimacy: a hand-painted tile inset in the courtyard wall, floral motifs carved in the lattice frames, or turtle-shaped balusters symbolizing longevity. *Hanji* paper windows softly filter a scene of autumn leaves, blurring interior and exterior. Such features prevent monotony and convey warmth, vitality, and playfulness.

Intenciones de diseño

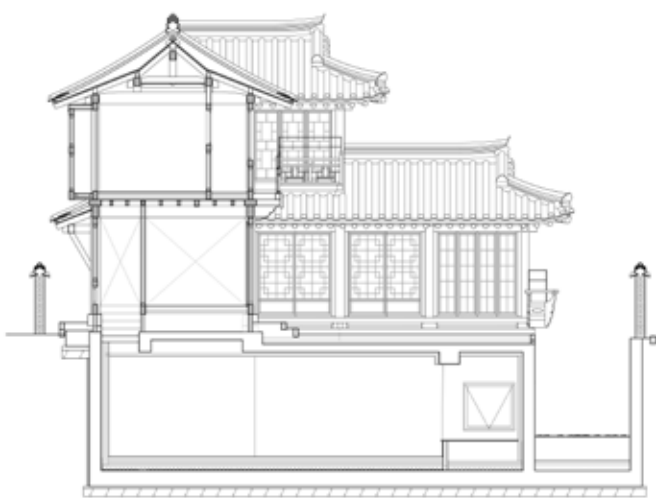
La casa no sólo se define mediante la secuencia espacial, sino por sus detalles. Junto con las sencillas paredes blancas y la pulcra carpintería de madera, hay pequeñas sorpresas e intimidad: un recuadro de azulejos pintados a mano en el muro del patio; motivos florales tallados en los marcos de la celosía o balaustres en forma de tortuga que simbolizan la longevidad. Las ventanas de papel *hanji* filtran suavemente una escena de árboles otoñales, difuminando interior y exterior. Estas cualidades evitan la monotonía y transmiten calidez, vitalidad y alegría.

Intenções do design

A casa é definida não só pela sua sequência espacial, mas também pelos seus detalhes. Juntamente com paredes brancas simples e marcenaria elegante, encontramos toques de surpresa e intimidade: um azulejo pintado à mão embutido na parede do pátio, motivos florais esculpidos nas molduras dos reticulados ou balaústres em forma de tartaruga simbolizando longevidade. As janelas de papel *Hanji* filtram suavemente uma cena com folhas de outono, diluindo o interior e exterior. Essas características evitam a monotonia e transmitem calor, vitalidade e diversão.



Elevation and sections | Alzado y secciones | Elevação e cortes



View from the second floor *Numaru* | Vista desde el *numaru* del segundo piso | Vista do *numaru* do segundo andar

Equally important is the concept of borrowed scenery (*chagyeong*). Whether from the *daecheong* hall, the guestroom, or the *numaru* veranda, the views extend over the courtyard to the mountains. The impression of spaciousness arises not from physical size but from carefully framed prospects, so that the architecture is permeated by openness while maintaining intimacy.

Igualmente importante es la idea de tomar prestado un paisaje (*chagyeong*). Tanto desde el salón *daecheong*, la habitación de invitados, o el porche *numaru*, las vistas se extienden desde el patio hasta las montañas. La sensación de amplitud no se consigue por las dimensiones físicas, sino por las perspectivas cuidadosamente enmarcadas, de manera que la arquitectura queda bañada por el espacio abierto y, al mismo tiempo, mantiene la intimidad.

Igualmente importante é o conceito de cenário emprestado (*chagyeong*). Seja do salão *daecheong*, do quarto de hóspedes ou da varanda *numaru*, as vistas estendem-se sobre o pátio até às montanhas. A sensação de amplitude não surge do tamanho físico, mas de perspectivas cuidadosamente enquadradas, de modo que a arquitectura é permeada por abertura, mantendo a intimidade.

Materials and Craft

The construction process combined traditional materials—wood, *hanji*, stone—with contemporary techniques for insulation and structural strength. Local artisans collaborated on bespoke joinery, lattice-carving, and tilework, so that tradition was not merely imitated but relived through craft. At the same time, modern waterproofing, heating, and reinforcement allowed for

Materiales y oficios

En el proceso de construcción se combinaron materiales tradicionales — madera, *hanji*, y piedra— con técnicas actuales de aislamiento y resistencia estructural. Artesanos locales colaboraron en la elaboración de la carpintería a medida, el tallado de las celosías y el alicatado, de modo que la tradición no quedó en una mera imitación, sino que revivió gracias a los oficios artesanales.

Materiais e artesanato

O processo de construção combinou materiais tradicionais — madeira, *hanji*, pedra — com técnicas contemporâneas de isolamento e resistência estrutural. Artesãos locais colaboraram na marcenaria personalizada, na escultura em reticulado e no trabalho com azulejos, de modo que a tradição não foi meramente imitada, mas revivida através do artesanato. Ao mesmo tempo, a impermeabilização,



a basement and a multi-level program rarely achievable in a hanok.

Al mismo tiempo, la impermeabilización, la calefacción y los refuerzos modernos permitieron la construcción de un sótano y de un programa de varias alturas que raramente se consigue en un hanok.

o aquecimento e o reforço modernos permitiram a construção de uma cave e um programa de vários níveis raramente alcançável numa Hanok.

Reflections and Outcome

Ultimately, Myeonglinheon is a home with multiple roles: a space for welcoming guests, a private sanctuary, and a versatile platform for present-day leisure. It shows how hanoks can evolve beyond nostalgia, accommodating both inherited rituals and modern aspirations. The owner’s personal touches—furniture, everyday objects, and carefully chosen ornaments—further humanize the dwelling.

True to its name—“Myeonglinheon”—the house radiates brightness and transparency, embodying a vision of harmonious living with neighbors, nature, and tradition.

Reflexiones y resultado

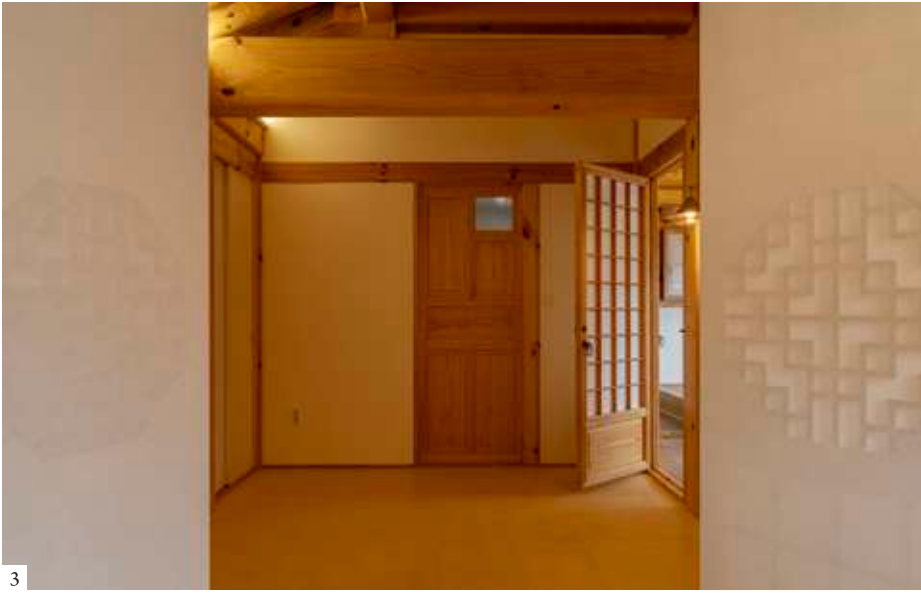
En el fondo, Myeonglinheon es una vivienda con múltiples funciones: un espacio donde recibir a los invitados, un refugio privado y una plataforma versátil para el ocio de nuestros días. Es una demostración de que los hanoks pueden evolucionar dejando atrás la nostalgia, y que en ellos caben tanto los rituales de antaño como los anhelos modernos. Los toques personales de los propietarios —muebles, objetos de uso cotidiano y ornamentos elegidos con gusto— dan un toque aún más humano a la vivienda.

Como su nombre indica, la casa “Myeonglinheonthe” irradia luminosidad y transparencia, y encarna un proyecto de vida en armonía con los vecinos, la naturaleza y la tradición.

Reflexões e resultado

Em última análise, Myeonglinheon é uma casa com múltiplas funções: um espaço para receber convidados, um refúgio privado e uma plataforma versátil para o lazer contemporâneo. Ela mostra como as Hanoks podem evoluir para além da nostalgia, acomodando tanto rituais herdados quanto aspirações modernas. Os toques pessoais do proprietário — móveis, objetos do quotidiano e ornamentos cuidadosamente escolhidos — humanizam ainda mais a residência.

Fiel ao seu nome — «Myeonglinheon» —, a casa irradia luminosidade e transparência, incorporando uma visão de vida harmoniosa com os vizinhos, a natureza e a tradição.



< Ground floor Numaru | Numaru de la planta baja | *Numaru do térreo*
> 1: Second floor living room toward the main bedroom 2, 3: Second floor bedroom | 1: Sala del segundo piso hacia el dormitorio principal 2, 3: Dormitorio del segundo piso | 1: Sala do segundo andar voltada para o quarto principal 2, 3: Quarto do segundo andar

Sugyeongjae: A Hanok That Borrows the Beauty of its Surroundings

Context and History

This hanok house called Sugyeongjae (收景齋), meaning “pavilion of gathered scenery,” takes its name from a poem by the late Goryeo monk Bo-u. His phrase about “gathering the scenery from three sides” resonates with its placement on a hillside in Gahoe-dong, Bukchon, facing south to take in both natural and urban vistas. Built during the 1930s development of Bukchon, the house originally consisted of a ㄇ-shaped main hall and ㄷ-shaped guest quarters, forming an open south-facing courtyard. From here one looks over the low stone wall toward Mount Namsan, with the tiled roofs of Bukchon Hanok Village unfolding below.

Sugyeongjae: Un hanok que recoge la belleza del entorno

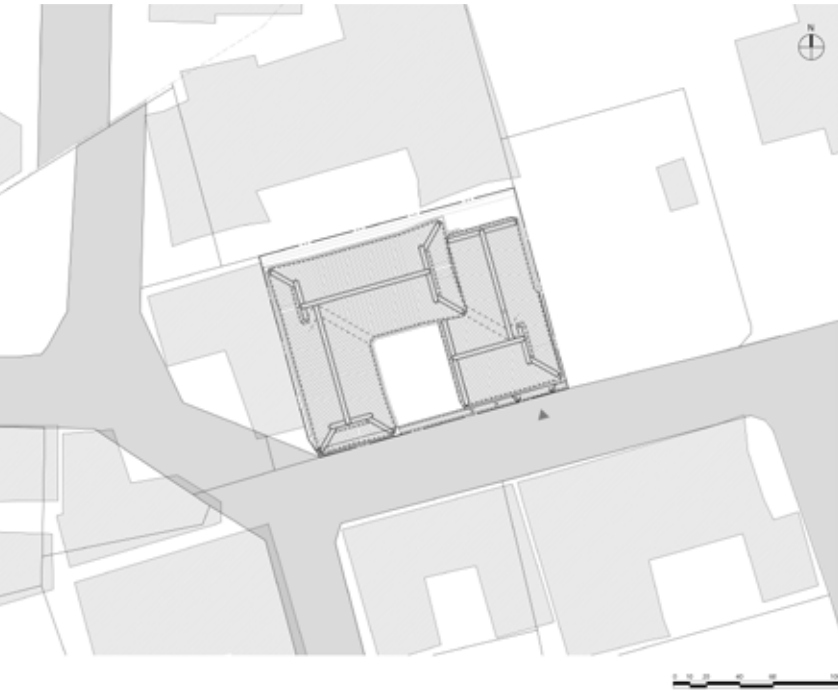
Contexto e historia

Esta casa hanok se llama Sugyeongjae (收景齋), es decir, “pabellón que recoge el paisaje” y toma su nombre de un poema del monje Bo-u, que vivió en el siglo XIV en Goryeo. Uno de los versos, que dice “recogiendo el paisaje por tres lados”, describe su ubicación en la ladera de una colina en Gahoe-dong (Bukchon), mirando al sur, con vistas de la naturaleza y la ciudad. Construida durante el desarrollo urbano de Bukchon en los años 1930, la casa consistía originalmente en un salón principal en ㄇ y las dependencias de los invitados en ㄷ, formando un patio abierto orientado al sur. Desde el patio, la vista traspasa el muro de piedra y alcanza hasta el Monte Namsan, sobrevolando las cubiertas de tejas de Bukchon Hanok Village.

Sugyeongjae: uma hanok que vai buscar a sua beleza aos seus arredores

Contexto e história

Esta casa Hanok chamada Sugyeongjae (收景齋), que significa «pavilhão da paisagem reunida», deve o seu nome a um poema do falecido monge Bo-u, da dinastia Goryeo. A sua frase sobre «reunir a paisagem dos três lados» ressoa com a sua localização numa encosta em Gahoe-dong, Bukchon, virada para sul para que se possa apreciar tanto as vistas naturais como urbanas. Construída durante o desenvolvimento de Bukchon na década de 1930, a casa consistia originalmente num salão principal em forma de ㄇ e num alojamento para hóspedes em forma de ㄷ, formando um pátio aberto virado a sul. Daqui, é possível ver o Monte Namsan por cima do muro baixo de pedra, com os telhados de telha da aldeia Hanok de Bukchon a estenderem-se por baixo.



Site Plan of the Sugyeongjae | Plano de situación de Sugyeongjae | Planta do local do Sugyeongjae



1



2

1: Entrance and exterior view of the Sugyeongjae
2: Render of the Sugyeongjae | 1: Entrada y vista exterior del Sugyeongjae 2: Render del Sugyeongjae | 1: Entrada e vista externa do Sugyeongjae 2: Render do Sugyeongjae

Design Intentions

After waiting fifteen years to reconstruct the house, the client envisioned a space that would channel the bright, warm energies of the setting. The design therefore opens the hanok to the courtyard, placing the *numaru* veranda, *daecheong* hall, and kitchen along the southern facade to receive natural light all day long. The sequence of courtyard–*daecheong*–private rooms means that

Intenciones de diseño

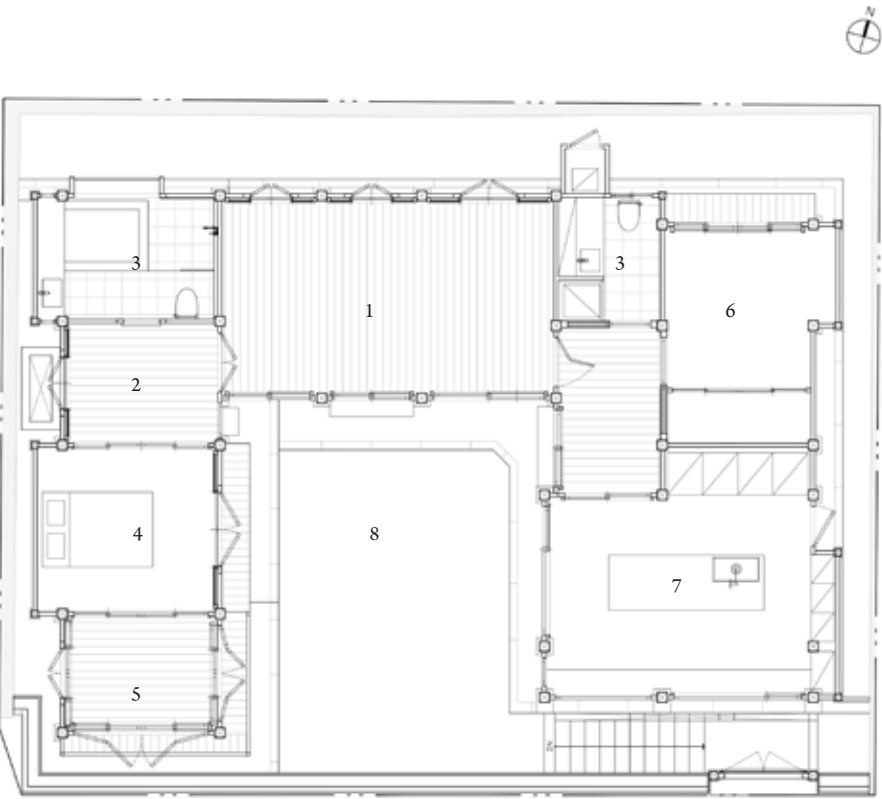
Tras esperar quince años para reconstruir la casa, el cliente imaginaba un espacio que canalizara las energías luminosas y cálidas del entorno. Por consiguiente, el hanok se abre al patio y sitúa el porche *numaru*, el salón *daecheong*, y la cocina en la fachada sur para que reciba luz natural durante todo el día. La secuencia de habitaciones privadas que dan al patio –*daecheong*– significa que la privacidad

Intenções do design

Após esperar quinze anos para reconstruir a casa, o cliente imaginou um espaço que canalizasse as energias brilhantes e quentes do ambiente. O design abre, assim, a Hanok para o pátio, colocando a varanda *numaru*, o salão *daecheong* e a cozinha ao longo da fachada sul para receber luz natural durante todo o dia. A sequência pátio–*daecheong*–quartos privados significa que a privacidade se



Courtyard | Patio | Pátio



Plan. Legend: 1-Main floor hall, *daecheong* 2-Library 3-Bath Room 4-Main Room 5-Verandah 6-Tea room 7-Kitchen 8-Garden | Planta. Leyenda: 1-Sala principal, *daecheong* 2-Biblioteca 3-Baño 4-Habitación principal 5-Veranda 6-Sala de té 7-Cocina 8-Jardín | Planta. Legenda: 1-Sala principal, *daecheong* 2-Biblioteca 3-Casa de banho 4-Quarto principal 5-Varanda 6-Sala de chá 7-Cozinha 8-Jardim

privacy deepens gradually. The master apartment is arranged as a suite of spaces—*numaru*, bedroom, study, and bathroom—facing the courtyard and mountains. Meanwhile, the guest quarters continue the *sarang* tradition, with a tea room, small *daecheong* hall, entryway, and kitchen oriented toward a quiet north-facing courtyard.

aumenta gradualmente. El apartamento principal está distribuido en una serie de espacios —*numaru*, dormitorio, estudio y baño— orientados al patio y las montañas. Por otra parte, las dependencias para invitados mantienen la tradición del *sarang*, con una sala para tomar el té, un pequeño salón *daecheong*, una entrada y una cocina que dan a un patio orientado al norte.

aprofunda gradualmente. O apartamento principal está organizado como uma suíte de espaços — *numaru*, quarto, escritório e casa de banho — de frente para o pátio e as montanhas. Enquanto isso, os aposentos dos hóspedes continuam a tradição *sarang*, com um salão de chá, um pequeno salão *daecheong*, uma entrada e uma cozinha orientadas para um pátio tranquilo voltado para o norte.

View of the *daecheong* from the tearoom | Vista del *daecheong* desde la sala de té | Vista do *daecheong* a partir da sala de chá



Spatial Organization

The main *daecheong* was extended from two bays to three so that its breadth is aligned with that of the courtyard. This establishes a strong north-south axis that connects mountain, village roofs, courtyard, *daecheong*, and rear garden in a cohesive sequence. The layering of interior and exterior reflects the hanok's traditional balance of openness and enclosure.

Organización espacial

El *daecheong* principal se amplió de dos a tres crujiás para que su anchura coincidiera con la del patio. De este modo se establece un gran eje norte-sur que conecta la montaña, el pueblo, los tejados de las casas, el patio, el *daecheong*, y el jardín trasero en una secuencia coherente. La superposición de interior y exterior refleja el equilibrio tradicional entre zonas abiertas y cerradas de los hanok.

Organização espacial

O *daecheong* principal foi ampliado de duas baías para três, de modo que a sua largura ficasse alinhada com a do pátio. Isso estabelece um forte eixo norte-sul que conecta a montanha, os telhados da aldeia, o pátio, o *daecheong* e o jardim das traseiras numa sequência coesa. A sobreposição de camadas internas e externas reflete o equilíbrio tradicional da Hanok entre abertura e confinamento.

was sourced from the same period or provided personally by the owner from chestnut trees in his factory grounds. This approach preserved authenticity while allowing the necessary repairs.

la madera procedía de la misma época o bien la proporcionó personalmente el propietario de los castaños que crecen en los terrenos de su fábrica. De esta manera se mantuvo la autenticidad y se pudieron hacer las reparaciones necesarias.

adicional foi obtida do mesmo período ou fornecida pessoalmente pelo proprietário, proveniente de castanheiros no terreno da sua fábrica. Esta abordagem preservou a autenticidade, permitindo ao mesmo tempo as reparações necessárias.

Materials and Preservation

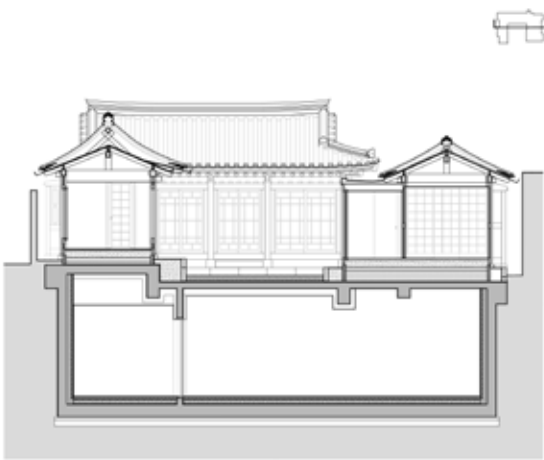
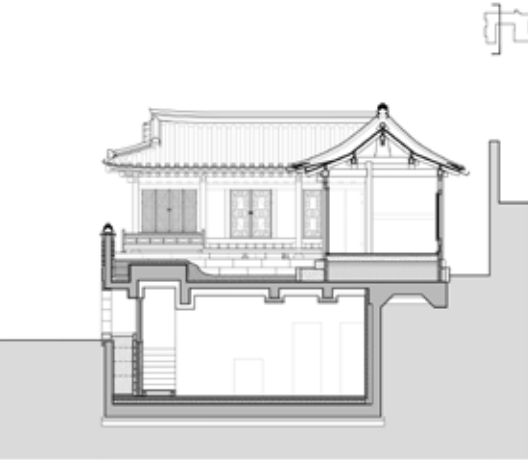
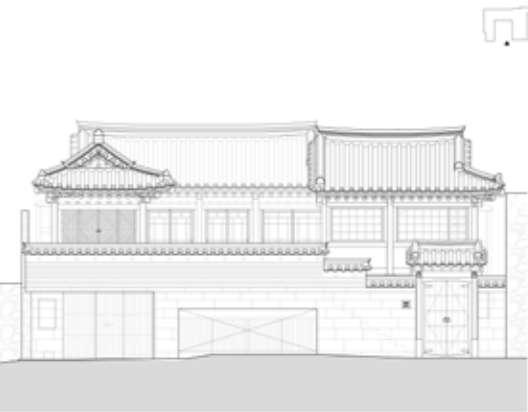
The project sought to conserve the original hanok as faithfully as possible. Reclaimed timber, tiles, and stone bases were used, while additional wood

Materiales y conservación

En el proyecto se intentó conservar el hanok original con la mayor fidelidad posible. Se utilizó madera, baldosas y bases de piedra recuperadas, y el resto de

Materiais e preservação

O projeto procurou conservar a Hanok original da forma mais fiel possível. Foram utilizadas madeira recuperada, telhas e bases de pedra, enquanto a madeira



Elevation and sections | Alzado y secciones | Elevação e cortes



Daecheong



View of the yard from the *daecheong* | Vista del patio desde el *daecheong* | Vista do pátio a partir da *daecheong*

A Modern Basement

Contrasting with the timber hanok above, a new concrete semi-basement was added. With a ceiling height of 4 meters, it is designed to host cultural exhibitions and community gatherings. Importantly, the site’s ground level was maintained, preserving the external view from the alley and the internal vista toward Namsan. The basement is partially exposed to the south, admitting light while preventing the courtyard walls from appearing overly tall. Deep-set windows regulate visibility and lighting, designed in the style of traditional *jumachang* shutters to balance openness and privacy.

Un sótano moderno

En contraste con el hanok de madera de arriba, se añadió un nuevo semisótano de hormigón. Con un techo de 4 metros de altura, está diseñado para albergar exposiciones culturales y reuniones comunitarias. Hay que subrayar que se mantuvo la planta baja, conservando la vista exterior desde el callejón y la vista desde el interior hacia Namsan. El sótano está parcialmente expuesto al sur, dejando pasar la luz y evitando que los muros del patio parezcan demasiado altos. Las ventanas profundas, que regulan la visibilidad e iluminación, están diseñadas en el estilo de las persianas *jumachang* para que haya un equilibrio entre apertura e intimidad.

Uma cave moderna

Em contraste com a Hanok de madeira acima descrita, foi adicionada uma nova semicave de betão. Com um pé direito de 4 metros, ela foi projetada para receber exposições culturais e reuniões comunitárias. É importante realçar que o nível do solo do local foi mantido, preservando a vista externa a partir da viela e a vista interna para Namsan. A cave está parcialmente exposta ao sul, permitindo a entrada de luz e evitando que as paredes do pátio pareçam excessivamente altas. Janelas recuadas regulam a visibilidade e a iluminação, projetadas no estilo das tradicionais persianas *jumachang* para equilibrar a abertura e a privacidade.

Entrance and Circulation

The two realms—hanok above and modern basement below—are linked by a tall door and stairs. The doorway, relocated to the southeast corner for better alignment with the road, forms a threshold allowing entry up to the courtyard or down to the gallery. Its tall proportions can accommodate large artworks, while a half-open timber-and-tile canopy offers shelter. The stairwell interior is finished in dark tones contrasting with the white exhibition halls, seamlessly transitioning between traditional and contemporary atmospheres.

Entrada y circulación

Los dos ambientes –el hanok arriba y el sótano abajo– están comunicados con una escalera y una puerta de gran altura. La entrada, que se ha reubicado en la esquina sureste para mejorar su posición respecto a la calle, forma un umbral desde el que se accede al patio o a la galería de abajo. Sus amplias proporciones permiten la instalación de grandes obras de arte, mientras que una marquesina semiabierto de madera y teja ofrece cobijo. El acabado interior de la escalera es de tonos oscuros, que contrastan con las salas de exposición blancas, en una transición continua entre ambiente tradicional y contemporáneo.

Entrada e circulação

As duas realidades — Hanok acima e cave moderna abaixo — estão ligadas por uma porta alta e escadas. A porta, transferida para o canto sudeste para melhor alinhamento com a estrada, forma um limiar que permite a entrada para o pátio ou para a galeria. As suas proporções altas podem acomodar grandes obras de arte, enquanto uma cobertura semiaberta de madeira e telhas oferece abrigo. O interior da escadaria tem acabamentos em tons escuros que contrastam com as salas de exposição brancas, fazendo uma transição perfeita entre os ambientes tradicional e contemporâneo.

Main bedroom | Dormitorio principal | Quarto principal



Main bedroom | Dormitorio principal | Quarto principal



Reflections and Outcome

Sugyeongjae embodies a dual purpose: preservation of the original Bukchon hanok form and adaptation for cultural uses. By maintaining its topographical logic, reusing historical materials, and embedding new functions, the project shows how tradition can be transmitted as a living practice rather than as a relic. The courtyard, gate, and views to Namsan embody Bukchon’s older spirit, while the basement expands the

Reflexiones y resultado

Sugyeongjae presenta una doble intención: la conservación de la forma original de un hanok de Bukchon y la adaptación a usos culturales. Al mantener su lógica topográfica, reutilizar materiales vernáculos e incorporar nuevas funciones, el proyecto demuestra que la tradición puede transmitirse como actividad viva y no como una reliquia. El patio, la puerta y las vistas de Namsan encarnan el espíritu antiguo de Bukchon, mientras

Reflexões e resultado

Sugyeongjae incorpora um duplo objetivo: a preservação da forma original da Hanok de Bukchon e adaptação para usos culturais. Ao manter a sua lógica topográfica, reutilizar materiais históricos e incorporar novas funções, o projeto mostra como a tradição pode ser transmitida como uma prática viva, em vez de uma reliquia. O pátio, o portão e as vistas para Namsan incorporam o espírito mais antigo de Bukchon, enquanto a

hanok into a role as both home and public space. Ultimately, Sugyeongjae invites us to imagine how heritage may participate in shaping the city of the future.

que el sótano amplía el hanok para que funcione como hogar y espacio público. En definitiva, Sugyeongjae nos invita a imaginar de qué manera el patrimonio puede contribuir a dar forma a la ciudad del futuro.

cave expande a Hanok para um papel tanto de casa como de espaço público. Em última análise, Sugyeongjae convida-nos a imaginar como o património pode participar na formação da cidade do futuro.

Biography | Biografía | Biografia

Kim Won-cheon

Kim Won-cheon, head of the Chamoree Group, has devoted more than two decades to the design, construction, and preservation of hanoks, the traditional wooden houses of Korea. He started out as a carpenter in major palace restorations such as Changdeokgung’s Royal Library and Gyeongbokgung’s Geunjeongjeon Hall, and later served as senior architect at Gu-ga Urban Architecture and led numerous projects in Bukchon. In 2014 he founded the Chamoree Architecture Cooperative and he now directs Chamoree Architects, Hanok Sallim, and Chamoree Construction. Under his leadership, the group continues to reinterpret hanoks for contemporary life while preserving their heritage. Both Myeonglinheon and Sugyeongjae were realized under his guidance, reflecting his vision of the hanok as a living urban legacy bridging past and future.

Kim Won-cheon, director del Grupo Chamoree, ha dedicado más de dos décadas a proyectar, construir y conservar hanoks, las casas de madera tradicionales de Corea. Empezó como carpintero en importantes restauraciones de palacios, como la Biblioteca Real de Changdeokgung y el Salón Geunjeongjeon de Gyeongbokgung, y después trabajó como arquitecto sénior en el estudio Gu-ga Urban Architecture y dirigió numerosos proyectos en Bukchon. En 2014 fundó la cooperativa de arquitectura Chamoree y actualmente dirige Chamoree Architects, Hanok Sallim, y Chamoree Construction. Bajo su liderazgo, el grupo sigue reinterpretando los hanoks para la vida actual, al tiempo que conserva el patrimonio. Tanto Myeonglinheon como Sugyeongjae se realizaron bajo su dirección y reflejan su visión del hanok como legado urbano vivo que conecta pasado y futuro.

Kim Won-cheon, diretor do Grupo Chamoree, dedicou mais de duas décadas ao projeto, construção e preservação de Hanoks, as casas tradicionais de madeira da Coreia. Começou como carpinteiro em grandes restaurações de palácios, como a Biblioteca Real de Changdeokgung e o Salão Geunjeongjeon de Gyeongbokgung, e mais tarde trabalhou como arquiteto sénior na Gu-ga Urban Architecture e liderou vários projetos em Bukchon. Em 2014, fundou a Cooperativa de Arquitetura Chamoree e agora dirige a Chamoree Architects, a Hanok Sallim e a Chamoree Construction. Sob a sua liderança, o grupo continua a reinterpretar as Hanoks para a vida contemporânea, preservando o seu património. Tanto Myeonglinheon como Sugyeongjae foram realizadas sob a sua orientação, refletindo a sua visão da hanok como um legado urbano vivo que une o passado e o futuro.



Views from the kitchen | Vistas desde la cocina
| Vistas da cozinha



Numaru

Reflections Reflexiones Reflexões



218 *Rediscovering the Half-Timber Tradition*
Redescubrir la tradición del entramado de
madera
Redescobrir a tradição das casas em enxaimel
Dirk Mortier

234 *Ecological Systems of Care:*
The Nubian Homes of Gharb Aswan
Sistemas sostenibles de cuidados:
Las viviendas nubias de Gharb Asuán
Sistemas sustentáveis de cuidados:
As casas nubianas de Gharb Aswan
Neha Garg

244 *The Art of Khachkar-Making*
El arte de construir khachkars
A arte de construir khachkars
Artak Hambardzumyan

254 *Fetsund: Reimagining the Norwegian Village*
Fetsund: Reimaginar la aldea noruega
Fetsund: Reimaginar a aldeia norueguesa
Arild Eriksen, Kristoffer Røgeberg

266 *Selected Counterprojects in Brussels*
Selección de contraproyectos para Bruselas
Seleção de contraprojetos para Bruxelas
Lucien Steil, Victoria Schulz-Daubas

276 *Indiana Limestone in*
Three Classical Buildings Today
La piedra caliza de Indiana
en tres edificios clásicos actuales
O calcário de Indiana
em três edifícios clássicos atuais
Thomas D. Stroka

290 *An Active Water-Driven Hammer Forge: Mazo*
de Mazonovo and Wrought Ironwork in Asturias
Una fragua hidráulica en activo: El Mazo de
Mazonovo y la forja del hierro en Asturias
Uma forja hidráulica em atividade: O Mazo de
Mazonovo e a forja do ferro nas Astúrias
Friedrich Bramsteidl



Dirk Mortier

Rediscovering the Half-Timber Tradition

Redescubrir la tradición del entramado de madera

Redescobrir a tradição das casas em enxaimel

Abstract | Resumen | Resumo

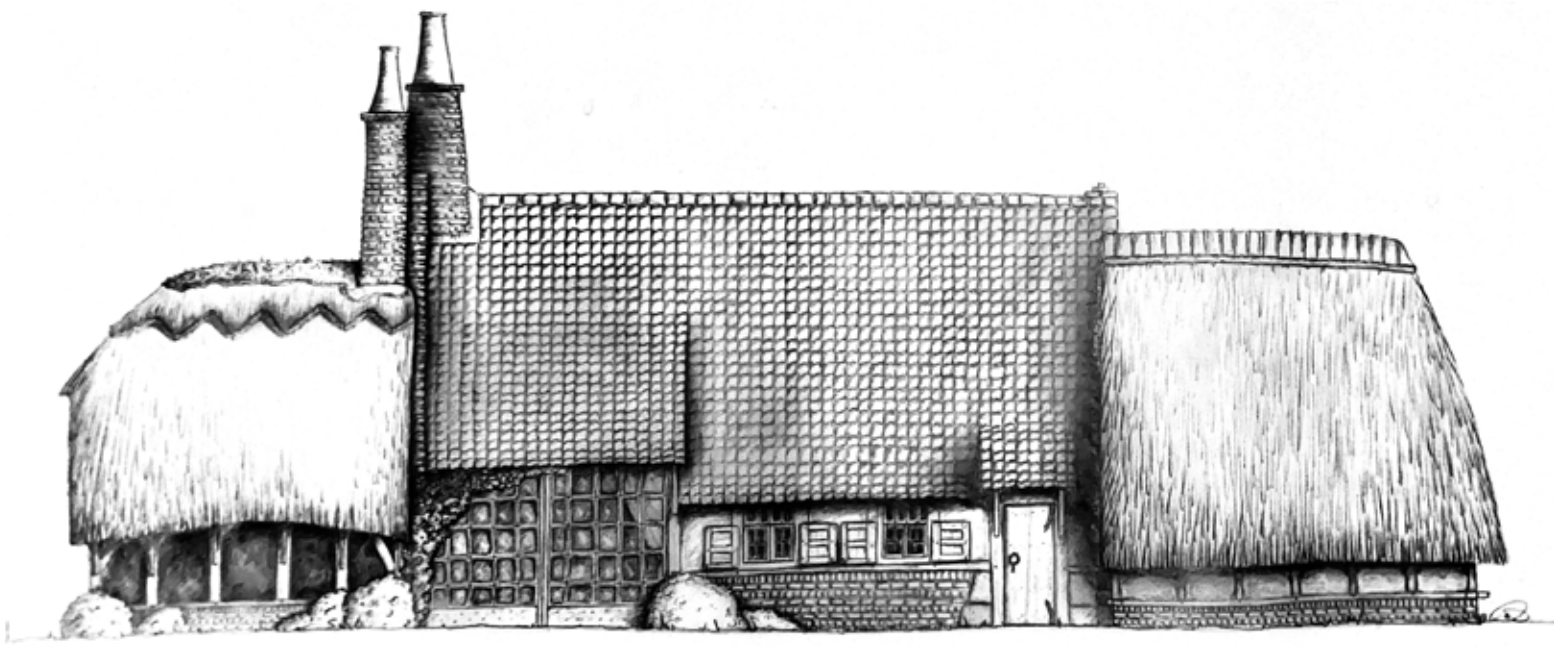
After many years working as a commercial manager in the petrochemical industry, I decided at the age of forty to radically change direction and devote myself to timber-framed architecture—a tradition that in Belgium was nearly lost. I studied historic rural buildings, visited open-air museums, and began restoring and building with traditional techniques and natural materials such as green wood, reclaimed bricks, and lime mortar. I seek to show that these methods are not relics of the past but viable, sustainable approaches for today. I also feel a responsibility to pass on this knowledge. Through regular workshops and hands-on activities with young people, I help preserve traditional know-how and encourage future generations to value and continue these time-tested ways of building.

Después de trabajar largo tiempo como director comercial en la industria petroquímica, a los cuarenta años decidí cambiar radicalmente de rumbo y dedicarme a la arquitectura de entramado de madera, una tradición que en Bélgica estaba a punto de desaparecer. Estudié construcciones rurales históricas, visité museos al aire libre y comencé a restaurar y construir con técnicas tradicionales y materiales naturales, como madera fresca, ladrillos recuperados y mortero de cal. Intento demostrar que estos métodos no son reliquias del pasado, sino enfoques viables y sostenibles hoy en día. También me siento responsable de transmitir estos conocimientos. Mediante talleres periódicos y actividades prácticas con jóvenes, contribuyo a conservar los conocimientos tradicionales y animo a las generaciones futuras a valorar y mantener estos métodos de construcción de eficacia probada.

Após muitos anos a trabalhar como gestor comercial na indústria petroquímica, decidi, aos quarenta anos, mudar radicalmente de rumo e dedicar-me à arquitetura em enxaimel – uma tradição que, na Bélgica, estava quase perdida. Estudei edifícios rurais históricos, visitei museus ao ar livre e comecei a restaurar e a construir com técnicas tradicionais e materiais naturais, como madeira verde, tijolos reutilizados e argamassa de cal. Procuo mostrar que estes métodos não são relíquias do passado, mas abordagens viáveis e sustentáveis para os dias de hoje. Também sinto a responsabilidade de transmitir este conhecimento. Através de workshops regulares e atividades práticas com jovens, ajudo a preservar o saber tradicional e incentivo as gerações futuras a valorizar e continuar estas formas de construção validadas pelo tempo.

< Dirk Mortier's workshop

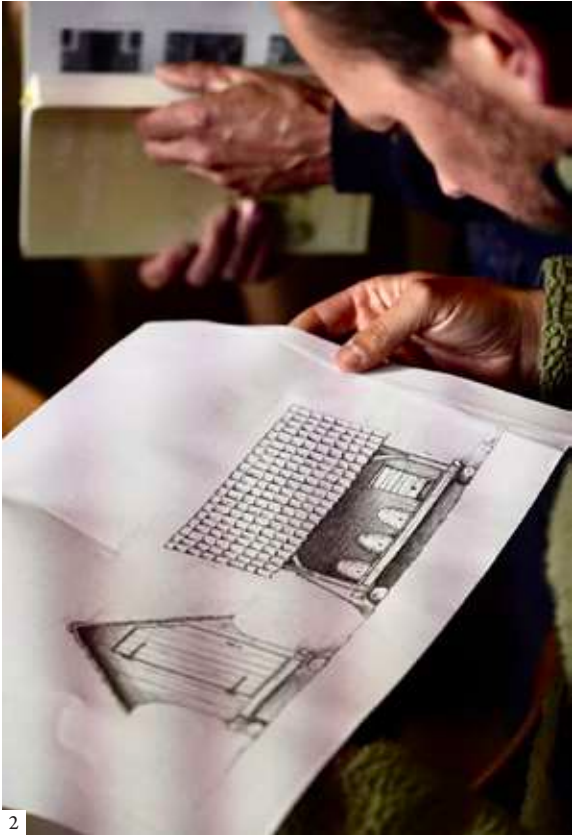
Sketches for upcoming half-timber structures



My journey into the world of timber-framed architecture began not in a carpenter’s workshop but in the offices of the petrochemical industry. For years I worked as a commercial manager, overseeing transactions in the sector. But at the age of forty I reached a turning point. Realizing that I had two more decades of work ahead, I began to question how I truly wanted to spend my time. I had always admired traditional craftsmanship, so I decided to take a chance and attempt to revive a nearly forgotten architectural heritage.

Half-timber architecture, once prevalent in Flanders, has largely disappeared. War and industrialization have erased most remnants of it from the landscape and modern regulations make its revival difficult. Post-war reconstruction prioritized efficiency, resulting in the replacement of vernacular structures with standardized, mass-produced ones. The rural architecture that once defined the region was deemed old-fashioned and impractical.

1: Designing a new timber-frame project at the drawing table (Emmanuel Sepulchre)
2: Discussing a commission with a client



Selecting and measuring trees before milling



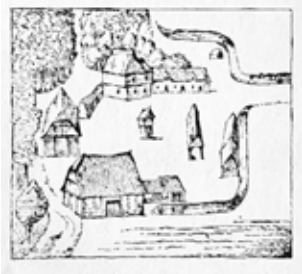
1: Restored barn in Brakel, Belgium

2: One of Dirk Mortier’s first reconstructions, completed in 2007 in Ellezelles

This loss goes beyond aesthetics; it is a break in cultural heritage. For centuries, builders and artisans selected local timber, handcrafted joints, and worked with natural materials suited to each place—practices shaped by a deep understanding of those materials and by the climate and community. Today, these principles have largely been forgotten and replaced by rigid construction codes that ignore traditional methods.

Finding my place in construction wasn’t straightforward. I wasn’t the only one wanting to build and it took me time to find my way. That changed the day I came across a book by a builder of oak-wood structures, full of pictures of timber-framed buildings. These, however, were commercial models—pre-designed and fabricated for distribution across the continent. While they looked appealing, to me they seemed soulless, lacking the authenticity I sought.

Eclectic half-timber residence in Koersel, completed in 2018



Original miniature from the seventeenth-century



Reconstruction of a Flemish pigeon tower inspired by a seventeenth-century miniature

This made me reflect on my own region. Every place has its own architectural identity, yet here in Belgium, particularly in Flanders and Wallonia, much of the timber-framed heritage contributing to that identity has disappeared. Romanticized timber villages were to be seen in fairy-tale books and films, but most of our historic wooden-framed buildings had gone. Flanders, having been a battlefield for centuries, had seen much of its architectural wealth wiped away by successive wars. That realization prompted me to explore what remained of our traditions and to reconnect with our ancestral building heritage.

Determined to revive this tradition, I immersed myself in the study of historical rural structures, visited open-air museums such as Bokrijk in Limburg, and explored foundational texts such as *Landelijke Architectuur* by Clemens V. Trefois and *Hoeven op land gebouwd* by Vic Goedseels and Luc Vanhaute.

One of my first experiences was with a timber-framed barn that a local farmer intended to dismantle and use as firewood. Recognizing its value, I was able to acquire it, hoping to reconstruct it. However,



1: Timber-framed pigeon tower built for a landscape exhibition in Beveren-Waas, Belgium



2



3

2: Assembling two timber pigeon towers in the workshop

3: Completed pigeon tower integrated into the rural landscape (Emmanuel Sepulchre)

bureaucratic hurdles in Belgium made rebuilding impossible, and in the end I had to sell it on to someone in the Netherlands, where it was successfully reassembled in a village.

This first experience strengthened my mission: to design and build using traditional techniques adapted to modern needs. Every step of my work, from sourcing timber to crafting joints and assembling structures, is performed in keeping with former methods. Unlike modern timber construction, in which beams are pre-cut to standardized sizes, I work with varying dimensions based on historical models.

Another defining project was the reconstruction of a pigeon tower, inspired by a seventeenth-century miniature illustration. In Flanders, all historical timber-framed dovecotes had been demolished, with only written references and drawings remaining. I built my first such tower as a demonstration at a country fair, and to my surprise, the organizers asked me to leave it there permanently. This exposure led to commissions and helped reignite interest in this nearly defunct architectural form.



1



2



3



4



5

1: Archival image of a cart shed destroyed during the First World War

2: A surviving shed identified for dismantling and reassembly

3-5: Step-by-step restoration of the timber cart shed



Restored cart shed on its historical site in Westvleteren, Belgium

A larger project was the restoration of a historic wagon shed originally located next to a residence of the Knights Templar. The only surviving record of it was a black-and-white photo from the time of World War I. We found a similar shed just a few miles away and carefully dismantled it so as to move it piece by piece to the Templar site. Using traditional joinery techniques with wooden pegs rather than nails, we ensured that the structure retained its original integrity. This project reflected the flexibility of historical construction—many timber buildings were designed to be disassembled and relocated, adapting to their owners' needs over generations.

I have also been involved in the design and construction of numerous barns, garden structures, and homes using traditional Flemish timber framing. These projects emphasize the integration of architecture with landscape, using natural materials that weather gracefully over time. The realization of these commissions has demonstrated that traditional building techniques are not just relics of the past but viable solutions for sustainable architecture today.

Unlike in most modern timber construction, which relies on industrially processed wood, I select trees directly from the forest. These must be straight, not unduly knotty, and from the middle of the forest rather than the edges, where they are more exposed to wind and develop a twisted grain. Contrary to modern custom, I work with green wood, which shrinks into place as it dries, tightening the joints naturally. This practice, seen in historical buildings, has proven to be both effective and enduring.



Design drawing and finished timber chicken coop





Additionally, I use reclaimed bricks and traditional lime mortar for infill and masonry work. These materials, when properly sourced and applied, provide excellent thermal performance and breathability, preventing moisture buildup and structural decay.

In my workshop I keep a collection of tools that tell the story of craftsmanship from another era. One of my favorites is a plane that has a handle carved from a single piece of mahogany, evidencing the attention to detail that went into making it. In former times, craftsmen didn't just buy tools; they made them themselves, purchasing the ironwork but handcrafting the wooden parts to suit their needs. These were more than just functional objects—they were infused with skill and pride. That's why I keep them on my bench and share them with young visitors, letting them experience the difference between mass-produced plastic-handled tools and those made with care to last for generations.

1: Exhibition stand presenting Dirk Mortier's work at the Beervelde Country Fair

2: Demonstration session during a traditional carpentry workshop (Emmanuel Sepulchre)

3: Timber-frame assembly under way in the workshop

> Timber pavilion with integrated chicken coop designed for a garden



Despite the wealth of historical knowledge that exists, traditional architecture faces challenges in Belgium today. Regulations often favor modern construction techniques, imposing structural requirements incompatible with older methods. Official guidelines frequently prescribe oversized beams on safety grounds, despite the evidence of centuries-old structures still standing with much smaller sections. Many planners and officials lack the experience to assess the real structural integrity of traditional techniques, which results in excessive reinforcement requirements.

I remember a discussion I had with an architect about a timber-framed building we were working on. Traditionally, these structures stand freely on their stone foundations without any anchoring—like the historic buildings in Belgium or the ancient structures in China’s Forbidden City, which have survived for thousands of years in spite of earthquakes. But the architect was convinced that the walls had to be anchored, fearing that strong winds might carry them away. Despite his 20 years of experience, he couldn’t trust this long-standing method. He insisted I anchor the building, but I refused—and by that stage it wasn’t even possible to secure it as he wanted. If we look at centuries-

old buildings in places like Colmar, France, we find none of them are anchored to their foundations, yet they have stood the test of time. Still, fear prevailed. It’s strange—why doubt techniques that have worked for so long?

Another challenge is economic pressure in development. Traditional building techniques take time, and in an era where speed is prioritized, many clients are unwilling to invest in slow, artisanal methods. The general public often perceives traditional architecture as expensive or impractical while overlooking its durability. In contrast to modern structures, which often rely on synthetic materials that degrade over time, timber-framed buildings last for centuries if properly maintained.

What motivates me is not just the technical aspect of building but the joy of creating something that resonates with history and place. Many of my clients become enduring friends, and appreciate the spirit that goes into their homes. This personal connection is why I choose to remain a lone craftsman rather than expand into a commercial enterprise. I also feel a responsibility to pass on this knowledge,

Assembled timber truss during the erection of the structure in Laarne

Fabrication of structural elements for the De Wilde–De Scheppe project in Laarne, Belgium



Installing the timber framework on site





Roofing work underway on the De Wilde–De Scheppe project



Completed timber pavilion

which is why I regularly share my experience with younger generations through workshops organized by La Table Ronde de l'Architecture, an organization that promotes craftsmanship and architectural heritage. These encounters serve not only to preserve traditional know-how but also to spark curiosity and enthusiasm in future builders, helping keep these methods alive.

Through continuing research, practice, and advocacy, I hope to inspire others to see that traditional architecture is a viable, living legacy that can contribute meaningfully to contemporary construction. If more builders, architects, and homeowners recognize their value, traditional techniques may again play a role in how we build for the future.

Biography | Biografía | Biografia

Stefanos Polyzoides

Arquitecto y urbanista por la Universidad de Princeton. Su trayectoria ha abarcado un amplio abanico de trabajos de arquitectura y urbanismo, así como su historia, teoría, enseñanza y diseño. Es cofundador del Congress for the New Urbanism y, con su esposa Elizabeth Moule, socio de la firma Moule & Polyzoides desde que la fundaron en Pasadena, California, en 1990. De 1973 a 1997 fue Profesor Asociado de Arquitectura en la Universidad de Southern California y actualmente es Director de la Escuela de Arquitectura de la Universidad de Notre Dame (Indiana). Es coautor de *Los Angeles Courtyard Housing: A Typological Analysis* (1977), *The Plazas of New Mexico* (2012), y autor de *R.M. Schindler, Architect* (1982), entre otras muchas publicaciones. También ayudó a recuperar partes significativas de la historia arquitectónica y urbana del sur de California organizando exposiciones como: *Caltech 1910–1950: An Urban Architecture for Southern California*, *Myron Hunt 1868–1952: The Search for a Regional Architecture*, *Wallace Neff: The Romance of Regional Architecture*, y *Johnson, Kaufmann Coate: Partners in the California Style*.

Timber shade structure built by Mortier in his own garden



Neha Garg

*Ecological Systems of Care:
The Nubian Homes of Gharb Aswan*

*Sistemas sostenibles de cuidados:
Las viviendas nubias de Gharb Asuán*

*Sistemas sustentáveis de cuidados:
As casas nubianas de Gharb Aswan*

Abstract | Resumen | **Resumo**

With the rise of sustainable building and the growing desire to “build green” comes a need to understand the centuries-old practice of building with earth. For generations, earthen buildings have been integral to communities around the world, and it is these building practices that show the way for the innovative sustainable technologies we use today. During my travels in Egypt, while studying mud-brick Nubian homes in Gharb Aswan I encountered a unique way of combining ecological building with systems of care and resilience rooted in tradition and generations of craft. As building with earth is becoming popular within the discipline of architecture, can we learn to better understand and integrate care into our built environment in ways that are efficient, resourceful, and ecological?

Con el auge de la construcción sostenible y el creciente deseo de “construir verde”, surge la necesidad de conocer la práctica centenaria de construir con tierra. Durante generaciones, los edificios de tierra han sido un elemento básico de las comunidades de todo el mundo, y son estas prácticas constructivas las que muestran el camino para las tecnologías innovadoras y sostenibles que utilizamos en la actualidad. Durante mis viajes por Egipto, al estudiar las casas de adobe nubias de Gharb Asuán, me encontré con una forma única de combinar la construcción sostenible con sistemas de cuidados y adaptación arraigados en la tradición y en un oficio ejercido durante generaciones. A medida que la construcción con tierra adquiere popularidad en la disciplina de la arquitectura, ¿podemos aprender a comprender e integrar mejor los cuidados en el entorno construido de manera eficiente, ingeniosa y ecológica?

Com o crescimento da construção sustentável e o desejo crescente de “construir verde”, surge a necessidade de compreender a prática secular de construir com terra. Durante gerações, os edifícios de terra têm sido um elemento básico das comunidades em todo o mundo e são estas práticas de construção que mostram o caminho para as tecnologias sustentáveis inovadoras que utilizamos atualmente. Durante as minhas viagens ao Egito, ao estudar as casas núbias de tijolo de barro em Gharb Aswan, deparei-me com uma forma única de combinar a construção sustentável com sistemas de assistência e resiliência enraizados na tradição e em várias gerações de artesanato. Como a construção com terra está a tornar-se popular na disciplina da arquitetura, será que podemos aprender a compreender melhor e a integrar os sistemas de assistência no nosso ambiente construído de formas eficientes, engenhosas e ecológicas?

Building with Earth

The emerging interest in “earthen architecture” – architecture made of raw earth sourced directly from the landscape – reflects a need in the architectural profession to build more sustainably and economically. Earthen construction is by no means a new practice; its earliest uses date back to 10,000–8,000 BCE in Mesopotamia, where mud bricks (sun-dried bricks of mud, straw, and sand) were used in civic and domestic structures (Campbell 2003: 13). Mud bricks are still seen in many parts of the world, primarily in vernacular structures rooted in tradition and cultural practice. Although this material has been rather left behind in an era of rapid urbanization and industrialization, mud-brick homes are still built, especially in rural contexts.

While traveling in Egypt’s Nile valley (through the Robert A.M. Stern 2023 Travel Fellowship), I encountered a multiplicity of mud-brick structures ranging from farmhouses, desert mountain dwellings, and agrarian dovecotes to the more widely recognized projects of Hassan Fathy and Ramses Wissa Wassef. These structures, varying in program and scale, showcase the rich history and subversive potential of building with earth, beyond materiality. These structures involve acts of ritualized maintenance, customary practices, placemaking, familial narratives, and more.

Within Egypt, Aswan was particularly memorable for the innovative variety of domestic spaces built by hand and cared for over generations. On visiting Aswan, the last leg of my journey up the Nile, I was struck by the importance placed on family and community, suggested both physically and immaterially. Spaces were customized to accommodate multiple generations of families and continuously maintained through modifications, replastering, and redecoration. The Nubian homes in Gharb Aswan show the architectural potential of mud bricks and also reflect the importance of tradition and craftsmanship in innovative building and sustainable living.

1: Mud bricks laid out to dry at a production site in Luxor, Egypt

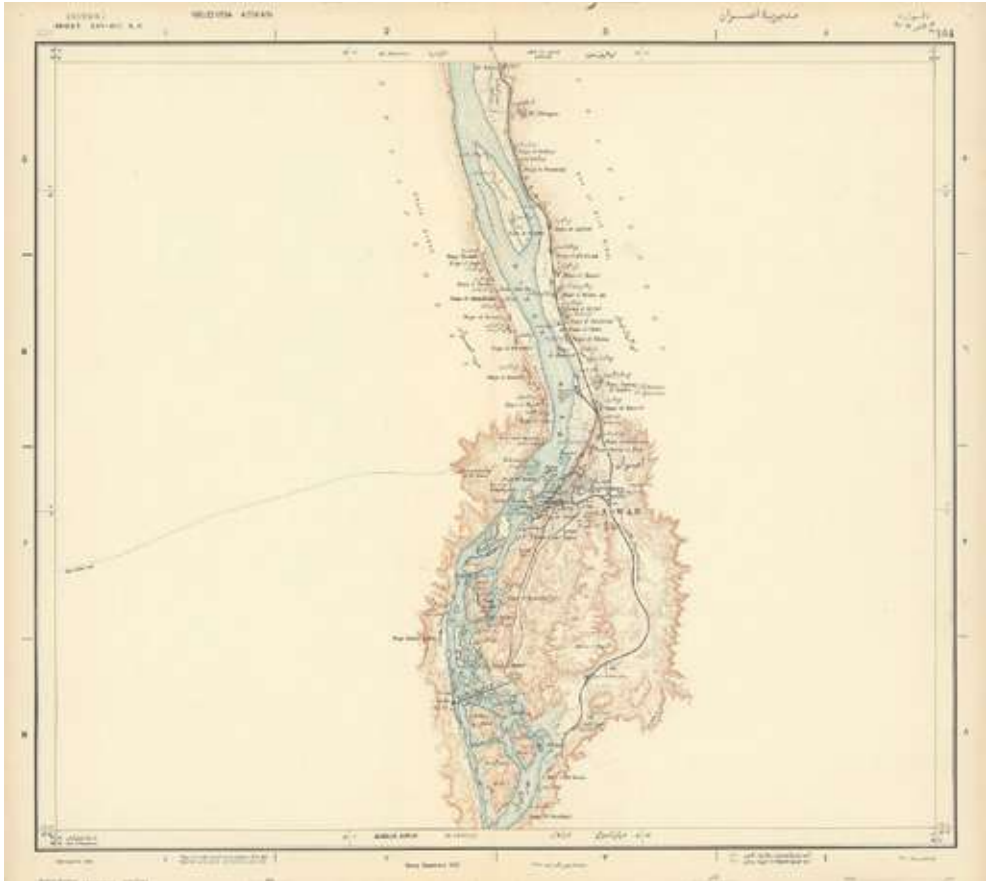
2: Mud bricks stacked for transportation



1



2



Map of Aswan, 1913 (David Rumsey Map Center, Stanford Libraries)

Histories of Nubia

Nubia is the region between the first cataract of the Nile near Aswan (Egypt) and Khartoum (Sudan), where the Blue Nile joins the White Nile. The name *Nubia* is of contested origin but is widely thought to derive from the Nubian *nubere*, meaning gold (Agha 2019: 1). Ancient Nubia, or “the Land of Gold”, was a civilization with dynastic rule likely dating back longer than ancient Egypt. While many scholarly institutions have long focused on Egypt, Nubia’s monuments gained global attention in 1959, through the International Campaign to Save the Monuments of Nubia. Led by UNESCO, the campaign was a response to the construction of the Aswan High Dam in the 1960s. Built to provide regular irrigation and water supply to cities in northern Egypt, the dam also submerged many ancient Nubian monuments under the 5,000 km² reservoir known as Lake

Satellite imagery of Lake Nasser, 1960-2023 (Google Earth)



Satellite imagery of Nagel-Gulab, 2023 (Google Earth)

Nasser. The campaign succeeded in saving some historic edifices, most notably Abu Simbel, which was reconstructed piece by piece on higher ground, but many others were submerged. A lesser-known story is the loss of ancestral land of the Nubian people who once resided on the river banks. An estimated 50,000 Egyptian Nubians and even more in Sudan were displaced as a result of the nationalist dam project and forced to relocate near Kom Ombo and Esna or to rebuild their villages elsewhere (El-Hakim 2008: 1).

The history of industrial flooding in Nubia precedes the 1960s; the Aswan Low Dam, built by British colonists in 1902 and subsequently raised in 1912 and 1933, also flooded many *feddans* (acres) of Nubian land. Families were forced to seek higher ground on various islands or on the west bank of the Nile at Gharb Aswan.

Gharb Aswan: Nagel-Gulab

Upon arriving in Gharb Aswan, my first stop was a home in the village of Nagel-Gulab, separated from the river by a stretch of fertile cropland. Nagel-Gulab receives less foot traffic than other parts

1: Street view of Nagel-Gulab

2: Main entrance plastered in mud





1: Urban plan of Nagel-Gulab, by the Nile
2: Example of layouts in Nagel-Gulab

of Aswan, although some tourists come here to enjoy the cuisine and culture in guesthouses. I was fortunate to be shown around the village by my colleague Moataz, who has family friends here.

Nagel-Gulab likely dates back to the second or third raising of the Aswan Low Dam in the early 1900s and is currently home to some 10,000 people. The village’s urban fabric is rooted in Nubian architectural and planning tradition, with houses of various sizes arranged in a grid-like pattern perpendicular to the Nile. Most often, the main entrances face the river to the east. The exterior mud-brick walls are grand and ornate, often with colorful murals and patterns or molded ornamentation. Openings in exterior walls are rare and scale is suggested by dispersed doorways between abutting structures. A *mastaba*, or molded mud bench, is often found along exterior walls to provide seating for communal or public gatherings in the street. The houses’ elevations are colorful, painted light blue, yellow, purple, or white with motifs of nature or hajj paintings depicting pilgrimage to Mecca. Traditionally, once houses are built, women and children start the process of plastering a layer of mud on the walls and painting decorative patterns and motifs on both exteriors and interiors.



View from the *huash* to private domestic spaces

Inside the Home

The first home I visited belonged to Moataz’s friend, and in a typical manner, we entered through a large courtyard or *haush*. The *huash* is sandy and has a tiled walkway at the perimeter. Once inside, one is struck by the scale of these traditional homes. While only a decorated perimeter wall with sparse openings can be seen from the exterior, the interior contains various rooms with different programs all facing the *haush*. Traditionally the courtyard serves many utilitarian purposes, such as raising cattle or chickens and growing vegetables. It is also a space for public gatherings and family events, such as weddings or other celebrations. The *haush* gives each family “a private piece of the sky”, while also naturally ventilating the house from the interior, allowing cool air to circulate in the adjacent living spaces. It remains a vital part of many Nubian homes, blurring the threshold between more conventionally perceived interior and exterior space.

A *mandara*, or guestroom, is usually one of the first spaces in a home, open to the elements through a large arched doorway. *Mandaras* may also have a separate entrance so that guests may come and go without intruding on their hosts’ privacy. Hospitality is an important, integral aspect of Nubian homes, and the construction of a spacious, decorated *mandara* open to the *haush* spatializes this.

Mandaras, like other bedrooms and living rooms in a Nubian home, often have vaulted roofs. The Nubian vault, a term widely used to describe the vaulting in traditional homes, is made of self-supported mud bricks, with no need for timber structure. The bricks are laid in a catenary curve at a slight angle, leaning against the gable wall. As each course is laid and mortared with mud, the vault becomes more structurally sound. Once finished, it is plastered with a layer of mud that can be combined with sand and lime to improve water resistance in the rare rainstorms. The ancient Nubian vaulting technique allows a structure to be built uniformly of mud brick and contributes to passive

1: View into the vaulted *mandara* room
2: View of the *mandara* from the *huash*



1



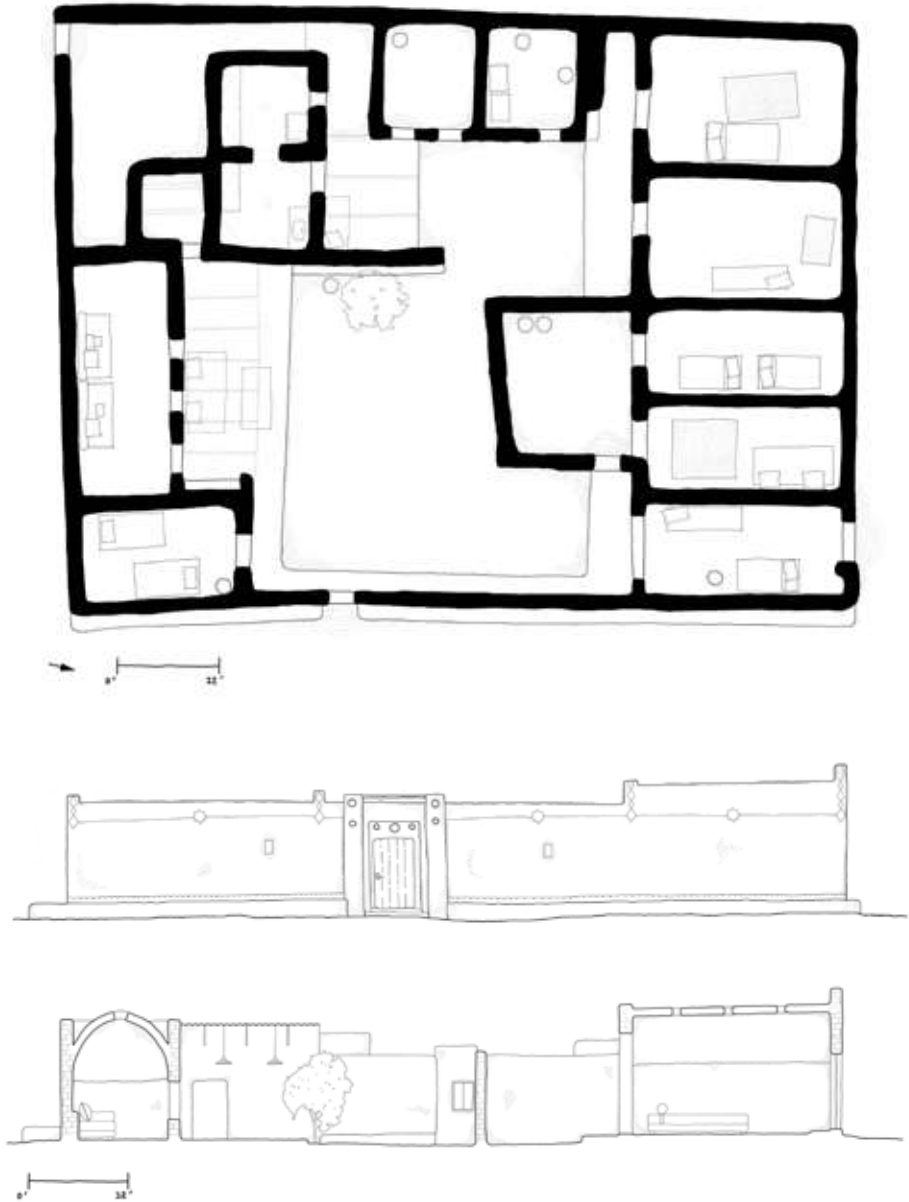
2

cooling strategies against the harsh heat. As hot air enters the space, it rises and escapes through small openings at the top of the vault that also naturally light the interior. Additionally, vaults can be built quickly, by two skilled masons in a few days. One of the first architects to adopt Nubian vaulting principles in contemporary projects was Hassan Fathy, most notably at New Gournia Village in Luxor. The neo-vernacular principles he applied were learned during visits to Nubian villages in Egypt and Sudan, where he and other practitioners documented, sketched, and studied the local techniques.

The kitchen in this home included two smaller rooms, around 2 m² in size, with domed roofs that allow smoke to escape through openings. Adjacent to the kitchen there is usually a space for a pantry or an animal enclosure. Vegetables or meat needing drying may be hung in the pantry until ready for preparation.

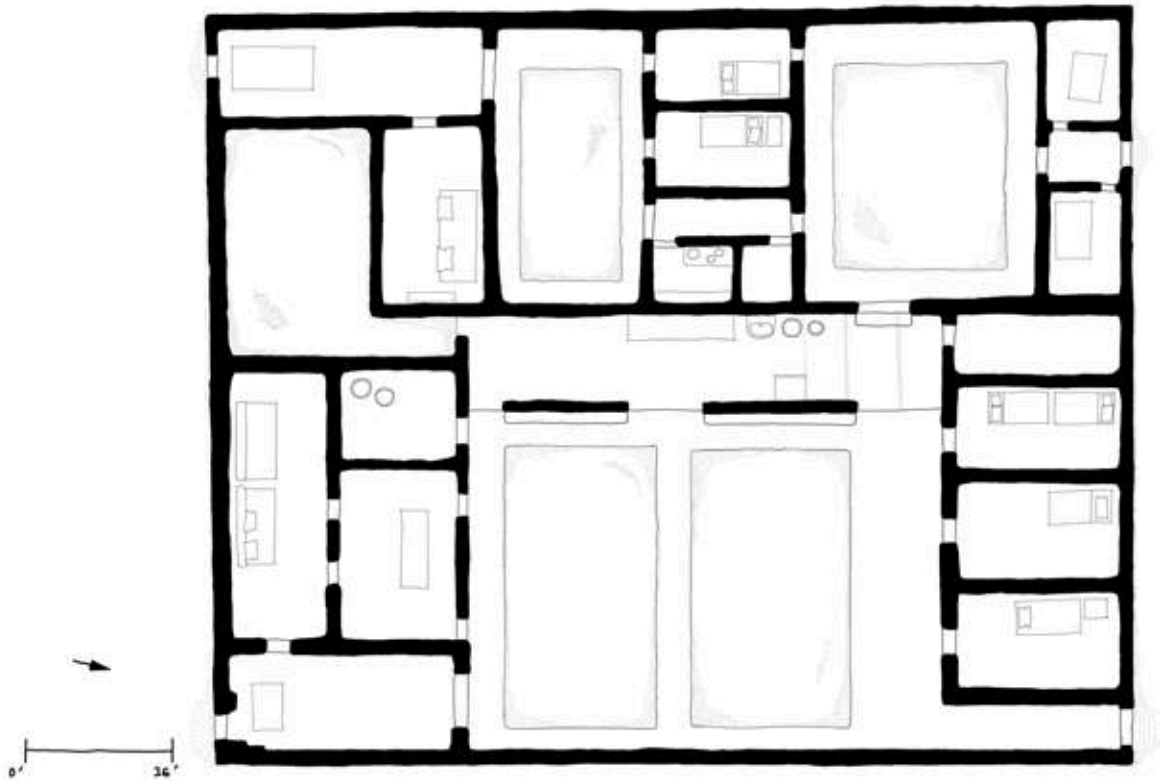
Moataz’s friend told me the history of her house as we sat in the tin-covered loggia facing the courtyard, the only space where metal was used for building. Her father-in-law built the house following the 1933 raising of the Low Dam, when many others were also built. The village had a much larger population in the early-to-mid twentieth century but was collectively built in just a year,

Plan, elevation and section through a living room, loggia, *huash*, and *mandara* of a multi-generational Nubian dwelling



The main *huash*

through communal effort and participation. Her husband grew up in the house, and now they share the home with her two daughters and mother-in-law. The house also contains a smaller courtyard built around two bedrooms next to the *mandara*, as an addition intended to serve as a transitional home for her sister-in-law after she married, until her husband saved enough to build a house of his own. The importance placed on family and family history in Nubian homes is unmistakable, from



Plan of a multi-generational Nubian home with three courtyards



Mural of everyday activities
at Nagel-Gulab

the stories intertwined in the crafting of the home to the spaces they contain for public or private family occasions.

Ritualized maintenance takes place at least once a year, and entails replastering of the walls and vaults with a mud mixture by hand. The act of replastering, repainting, and decorating is necessary to prevent water damage from the occasional rainstorm. Life in earthen homes is by no means static; annual maintenance and modifications as family sizes grow or shrink, as well as preparation for adverse weather, is part of a wider system of upkeep and knowledge. Friends and family, including women and children, hold special responsibility for the resiliency and longevity of these structures. Such homes reflect family changes and climatic events and challenge traditional notions of buildings designed as static entities. Rather, through ritualized maintenance and care, the home is ever-changing.

I visited many dwellings in Gharb Aswan, some still occupied and others abandoned over the years through migration to cities such as Cairo or Alexandria. Nubian homes told stories of families and changes over the years, through the construction of a second or third courtyard or the addition of new bedrooms along the perimeter wall. One home even had three courtyards, two kitchens, and a cattle pen. Although only the mother and daughter currently lived in this expansive dwelling, as the sons had moved to Aswan for work, the whole home was beautifully maintained and cared for. Some homes in Nagel-Gulab had been left unfinished, with vast sandy courtyards and incomplete domestic spaces along the perimeter walls. A few homes had even been demolished and, in their place, four- or five-story red-brick apartment blocks rose, signaling a shift away from vernacular mud-brick homebuilding.

Systems of Care

Nubian homes can contribute significantly to the discipline of sustainable architecture and construction, in ways that exceed the material properties of mud brick. Nubian homes built communally and with care on a foundation of generational knowledge show a perfected art of building resourcefully, sustainably, and efficiently. The process of collective construction with the assistance of extended family and friends exemplify a humane, participatory approach that is often excluded from architectural discourse.

The homes I visited exhibited resilience through their regionally sensitive, nurturing design. As mud-brick and earthen architecture is becoming fashionable in the field, it is important to consider what we can learn from former methods. Learning from sustainable practices can greatly expand our knowledge repertoire. How might we integrate systems of care into systems of sustainability? After my travels, I returned with a better understanding of mud bricks, beyond their material and sustainable properties, but rather in terms of the social dimension of building with mud. Mud that is collected, molded, laid, and then decorated by hand is an example of combining efficient building practices with systems of care and craft. In some cases, when a house must be dismantled, the mud bricks are used as fertilizer, creating a beautiful cycle of returning to the earth after their use for shelter. The homes of Gharb Aswan illustrate how building resourcefully and intelligently can sustain multiple family generations, and the generations of knowledge embedded in these homes may be able to inform better building practices today.



Nubian village past and present

References | Referencias | Referências

Agha, Menna. 2019. Nubia Still Exists: On the Utility of the Nostalgic Space. *Humanities*, 8, 1: 24.

Campbell, James W. P. 2003. *Brick: A World History*. London: Thames and Hudson.

El-Hakim, Omar. 2008. *Nubian Architecture*. Cairo: The Palm Press.

Biography | Biografía | Biografia

Neha Garg

Neha Garg graduated from Cornell University’s Master of Architecture program in 2023. She had previously worked at In:Studio, Mayor+Kennedy Architects, and Marvel Architects as well as for other cultural institutions such as the Museum of Modern Art or the Van Alen Institute. In 2023 she was awarded the RAMSA Travel Fellowship to pursue research on mud-brick architecture in Egypt’s Nile valley. Neha’s research has focused on documenting structures through photography, drawing, and oral histories, while looking at the social dimensions of mud beyond its materiality and potential for building.

Artak Hambardzumyan

The Art of Khachkar-Making
El arte de construir khachkar
A arte de construir khachkar

Abstract | Resumen | Resumo

The *khachkar*, or Armenian cross-stone, has a unique cultural and artistic tradition originating in the fourth to the seventh centuries. Evolving from simple carved crosses to intricate compositions of symbolic motifs, it enjoyed a golden age spanning from the eleventh to the thirteenth centuries. Today, contemporary masters like Artak Hambardzumyan continue the tradition through both new and restoration work. Khachkar-making combines sculpture, geometry, theology, and ornamentation, following a rigorous process—from design to installation—where each piece is both a spiritual act and an artistic creation. In over 50 countries, Hambardzumyan’s works are to be seen in churches, public spaces, and cultural institutions, testifying to the *khachkar*’s enduring relevance as heritage and living art.

El *khachkar*, o cruz de piedra armenia, cuenta con una tradición cultural y artística única que se remonta a los siglos IV al VII. Evolucionado desde simples cruces talladas hasta complejas composiciones de motivos simbólicos, alcanzó su época dorada entre los siglos XI y XIII. En la actualidad, maestros contemporáneos como Artak Hambardzumyan continúan la tradición tanto en nuevas obras como en trabajos de restauración. La elaboración de *khachkars* combina escultura, geometría, teología y ornamentación, y sigue un riguroso proceso, desde el diseño hasta la instalación, en el que cada pieza constituye a la vez un acto espiritual y una creación artística. Las obras de Hambardzumyan pueden contemplarse en iglesias, espacios públicos e instituciones culturales de más de 50 países, testimonio de la vigencia del *khachkar* como patrimonio y arte vivo.

O *khachkar*, ou cruz de pedra armênia, tem uma tradição cultural e artística única que remonta aos séculos IV a VII. Evoluindo de simples cruces esculpidas para composições complexas de motivos simbólicos, viveu um período áureo entre os séculos XI e XIII. Hoje, mestres contemporâneos como Artak Hambardzumyan continuam a tradição através de trabalhos novos e de restauração. A construção do *khachkar* combina escultura, geometria, teologia e ornamentação, seguindo um processo rigoroso – do design à instalação – em que cada peça é tanto um ato espiritual quanto uma criação artística. Em mais de 50 países, as obras de Hambardzumyan podem ser vistas em igrejas, espaços públicos e instituições culturais, testemunhando a relevância duradoura do *khachkar* como patrimônio e arte viva.



This essay arose from an interview between Artak Hambardzumyan and the architect Seza Khorozian, helping shape and articulate these reflections.

An Armenian Phenomenon

The *khachkar*, or cross-stone, stands out globally as a uniquely Armenian phenomenon. No other nation has developed such a cultural form. While in other cultures carved stone may appear in the shape of gravestones, steles, or decorative facades, the *khachkar* is uniquely Armenian. *Khachkars* may be gravestones but also memorials, political statements, spiritual offerings, boundary markers, symbols of victory, and even stone manuscripts.

The art of *khachkar*-making emerged between the fourth and the seventh centuries. Early stones were very simple: crosses carved on quadrangular blocks. Their purpose was spiritual and commemorative, with an artistic language still developing.

It was in the eighth and ninth centuries that the canonical *khachkar* emerged, featuring a centrally placed cross standing over a rosette, symbolizing the path to eternity and rising up through reliefs of paradise garden motifs.

The Golden Age of *Khachkars*

Between the eleventh and thirteenth centuries, *khachkar* art reached a remarkable level of refinement, with compositions resembling stone embroidery, containing intricate weavings and highly symbolic ornamentation. Designs featured birds, plants, and geometric patterns, each carrying theological meaning: the dove symbolized the Holy Spirit, the serpent represented victory, the palm tree stood for the Tree of Life, and grapevines evoked the gardens of paradise.

- 1. *Khachkar* commemorating the 80th anniversary of the All Saints Armenian Apostolic Church in Chicago, 2024
- 2. *Khachkar* dedicated to the heroes of the 44-Day War, located in the courtyard of the Holy Spirit Church in Amsterdam, 2023
- 3. The *khachkar* located in the park at the entrance of Akhtala Monastery, 2024



1. *Khachkar* in Hatsarat, Gavar, 2020

2. *Khachkar* in the courtyard of Marmarashen School, 2022. Dedicated to the fallen heroes of the 44-Day War from Marmarashen

This era was the tradition’s creative heyday. Among its most distinguished masters were the architect and miniaturist Momik, known for his work at the church of Noravank and the surrounding *khachkars*, Poghos, sculptor of the famous *khachkar* at Goshavank, and Grigor, whose *khachkars* of Old Julfa in Nakhijevan remain a high-water mark, despite the loss of many of these stones.

From the early Christian period through the Middle Ages and into the present, the art of the *khachkar* has continued to evolve. Contemporary masters uphold and reinterpret the tradition with new methods and original approaches. I am honored to be one of its current practitioners.

Education and Transmission

I began working with *khachkars* in my school years. I often visited the studio of my uncle, Varazdat Hambardzumyan, whose work greatly influenced me. During vocational training at our school, while my classmates carved patterns in wood, I got a block of tuff stone and used my uncle’s tools to carve my first *khachkar*. It came out so nicely that it was placed in the school museum. That was the beginning of my journey.

Later I enrolled at the Armenian State Pedagogical University in the drawing and drafting department, where I graduated and did my master’s thesis on *Khachkar Art and Ornamentation*. Although I work primarily in my studio, I also travel extensively. My *khachkars* are installed in more than fifty countries, and I personally supervise their placement. For me, the art of the *khachkar* is not just a profession but a way of life.



Khachkar at St. Astvatsatsin Chapel in Arabkir, Yerevan, 2024

Teaching is an integral part of my practice. In my studio I work with students of various ages, many with prior experience in drawing but little familiarity with the material. This background is valuable, as it allows us to move beyond foundational instruction and to focus directly on essential aspects—understanding form, interpreting structure, working in space, and exploring the physical and symbolic properties of stone. I also receive tourist groups. These visits involve an introduction to the theoretical and practical dimensions of *khachkar*-making, giving visitors the opportunity to engage more closely with the tradition and witness the process of creation.

Over the years, many of my students have become masters in their own right. Some have founded workshops and carry forward the tradition independently. That, for me, is the most meaningful outcome of my teaching.

Visit to Artak’s studio in Yerevan, 2022



Materials and Tools

Khachkars are carved in several types of stone from the Armenian highlands, including tuff, basalt, granite, and, on occasion, marble. Tuff, in my experience, is the most suitable material. Its relatively low density and fine-grained texture make it highly workable, while its light, warm coloration enhances the visual depth of carved reliefs with an interplay of light and shadow. Despite its fragility, tuff exhibits notable durability, and its physical and aesthetic qualities—combined with its strong association with Armenian cultural heritage—make it, in my view, the quintessential *khachkar* stone.

Tuff must be approached with care, as it is prone to breaking, and the sculptor must regulate the force of each hammer blow. This stone is responsive to the artisan—it responds to you, not the other way around. Basalt, by contrast, is dense and rough. It requires stronger blows and thus it is the sculptor who must respond to the stone. Basalt can last around 900 years, whereas tuff, thanks to its composition, can endure for over 1,200 years.

The tools used in carving are varied—primarily chisels and hammers, with the type selected depending on the motif or level of detail required. Some electric tools are also employed nowadays, particularly for polishing or shaping larger surfaces.

Modern technology has introduced new tools such as 3D carving machines, which can reproduce entire sketches. Yet *khachkars* made this way lack spiritual and cultural depth and often appear artificial. When a *khachkar* is carved by hand, the master breathes life and spirit into the stone. Infused with prayer, it becomes a spiritual companion.

The Creative Process

The process of creating a *khachkar* is, for me, a journey of the soul—a testimony to eternity inscribed in stone. I follow two main approaches when sculpting: one grounded on a carefully prepared sketch, and another relying on direct interaction with the stone, allowing it to guide the creative process.

In the first approach, I begin with a thorough study of the subject, drawing on religious symbolism and theology. This research yields a detailed sketch, serving as a blueprint for the final composition. The sketch is then transferred to the stone. I start by polishing the main surfaces with angle grinders, then rough out the recesses and protruding planes, establishing the primary vertical and horizontal



Work in progress at Artak’s studio in Yerevan



Work in progress at Artak’s studio in Yerevan

axes. From here, the *khachkar* begins to take shape. Next comes fine carving using traditional tools—hammer and chisel. At this stage, more than technical skill is required: the work must be guided by faith.

In the second approach, I dispense with drawings. The stone itself becomes a partner in creation. I observe its color, texture, energy, and features. Cracks or tonal variations often show how the composition should evolve and which way the cross should be placed. This is an intuitive process, yet it still involves strict respect for geometric principles and internal harmony.

Each approach has its own logic. The first relies on discipline, control, and carefully planned structure; the second allows for spontaneity and a responsive dialogue between the carver and the stone. Ultimately, creating a *khachkar* is not merely technical and artistic work; it is an act of devotion.

Geometry and Symbolic Structure

The symbols carved into a *khachkar* are not chosen at random. They follow established traditions and convey precise ideological and theological messages. Christian symbols dominate—above all, the cross, occupying a central position and embodying Christ’s sacrifice and the promise of salvation. Around this, plant and animal motifs—leaves, flowers, vines, birds—symbolize life, rebirth, and heaven. Star and sun motifs represent divine light, eternity, and supreme wisdom. Interwoven geometric patterns express the concepts of infinity and the continuity of existence.



Work in progress at Artak’s studio in Yerevan

Geometry is also essential to the composition. Each *khachkar* follows a carefully defined geometric structure that ensures a harmonious arrangement of symbols and enhances their spiritual resonance. The layout is governed by a principle of vertical symmetry: the composition revolves around a central axis, with the cross at its heart. From this center the ornaments unfold, extending toward the edges in balanced and ordered patterns.

Circles, sacred rings, and decorative bands—often bordered or framed with tuff—serve to organize the surface and define sectors of symbolic content. This modular structure is common in many *khachkars*, with each section reflecting a recurrent and coherent logic.

The symbolic and geometric dimensions of a *khachkar* are inseparable. Geometry is the framework through which meaning is structured and revealed, allowing the viewer to perceive not only visual clarity but also a spiritual and ideological message.

Stages of Execution

The creation of a *khachkar* follows a distinct series of stages from design to installation. Once the stone has been selected and prepared, I determine the dimensions according to the *khachkar’s* intended function—commemorative, liturgical, or monumental. The design begins with the organization of the main elements: the central cross, concentric circles, interwoven bands, and ornamental details. Depending on the function, I may rely on classic motifs or introduce more innovative designs.

Particular attention is always given to the central cross—the work’s symbolic and compositional core. The duration of the process varies, from weeks to months, depending on the scale, complexity, and techniques involved.



Work in progress in Artak’s studio in Yerevan

Spiritual Demands

The most challenging aspect of *khachkar*-making is not so much the manual work as the spiritual labor. Each *khachkar* must be created with a pure mind and heart, because as well as an artifact it is a prayer carved in stone. Even when a familiar pattern is repeated, the result is never identical: the stone is unique, and the sculptor’s spiritual state changes from day to day.

What makes the process unrepeatable is this inner guidance—the silent prayer that is to be embedded in the material. Technical challenges come only afterward. If the work is approached with the right spirit, the hand will not err and every difficulty can be overcome.

A Worldwide Presence

Khachkar-making is both a craft and an art—perhaps the most complete of arts. It draws upon a range of disciplines: painting, miniature art, geometry, drafting, sculpture, theology, ornamentation, music, manuscript tradition, history, philosophy, psychology, and artistic engraving. All of these converge in the making of a cross-stone.

This is a highly specialised field, requiring manual skill and also cultural and symbolic knowledge. From the initial sketch to the final carving, it is an art form combining precision, experience, and spirituality.

My *khachkars* are to be seen in Armenia and also abroad, often installed in churchyards or public spaces, usually at the initiative of Armenian communities or ecclesiastical institutions. They serve

various purposes: commemorating the Armenian genocide, marking bonds of friendship between nations, accompanying newly built churches, or celebrating key events in the life of the diaspora.

In Armenia, my *khachkars* can be found in many significant and picturesque locations, in and around churches and monasteries. Abroad, they have been placed in sites such as Christ Church Cathedral in Dublin, St Mary’s Cathedral in Sydney, or the square in front of the Council of Europe building.

These have been milestones in my career, reflecting not only the reach of the tradition but also its ability to become a cultural bridge—uniting nations, communities, and even different faiths.



Khachkar at St. Mariam Astvatsatsin Monastery in Tegheri, 2024



1. Khachkar in Yerevan, 2023

2. Khachkar at St. Gayane Church in Etchmiadzin, 2022

Biographies | Biografías | Biografias

Artak Hambardzumyan

Artak Hambardzumyan is a painter, sculptor, and master *khachkar*-maker. A graduate of the Armenian State Pedagogical University, he has been a member of the Artists’ Union of Armenia since 2016. His stone-carved memorials and creative *khachkars* are to be found throughout Armenia, Artsakh, and over 25 countries worldwide, including the USA, France, Argentina, Egypt, and Bangladesh. His work often commemorates national heroes and historical events or marks sacred sites. Notable exhibitions of his output have been held at the Council of Europe, the Smithsonian Folklife Festival, and the Monastery of Akhtala. He has received numerous medals and awards for his artistic and cultural contributions. In 2025, his low relief of Saint Nerses Shnorhali will be installed at the Bzommar Monastery in Lebanon.

Seza Khorozian

Seza Khorozian is a master’s student in historic preservation at the University of Notre Dame. She was born and raised in Aleppo, Syria, and is ethnically Armenian. In 2019 she moved to Yerevan, Armenia, where she studied architecture at the National University of Architecture and Construction, graduating in the spring of 2024. She will complete the Master of Science in Historic Preservation program in the spring of 2026.

Arild Eriksen, Kristoffer Røgeberg

Fetsund: Reimagining the Norwegian Village

Fetsund: Reimaginar la aldea noruega

Fetsund: Reimaginar a aldeia norueguesa

Abstract | Resumen | Resumo

Many towns in Norway are characterized by limited housing diversity and car-dependent residential areas. In contrast, several European cities are developing neighborhoods with dense but low-rise housing, based on participatory processes in which residents are given influence. These processes result in public zoning plans and detailed design codes defining what may be built. But can this be adapted to existing residential areas? This study explores new models for suburban and small-town densification in Norway, challenging negative perceptions of suburban densification. We critique current planning tools for failing to ensure architectural integrity and community coherence, and advocate for design-led regulatory frameworks rooted in historical urbanism and emphasizing variation, sustainability, and co-creation. Our findings show how reimagined densification can create vibrant, affordable, and environmentally sound neighborhoods that counteract sprawl and foster strong communities in both suburban and rural contexts.

Muchas ciudades de Noruega se caracterizan por la escasa diversidad de sus viviendas y unas zonas residenciales supeditadas al automóvil. En cambio, varias ciudades europeas están promoviendo barrios con edificios de viviendas de baja altura y alta densidad gestados en procesos participativos en los que los residentes pueden influir. El resultado de estos procesos son unos planes de urbanismo públicos y unos códigos de edificación detallados que definen qué se puede construir. Pero, ¿se podrían adaptar estos planes a las zonas residenciales existentes? En este estudio se examinan nuevos modelos para la densificación de las áreas suburbanas y pequeñas ciudades en Noruega, y se cuestiona la percepción negativa de la densificación suburbana. Asimismo, se critican las herramientas de planificación actuales por no garantizar la integridad arquitectónica y la coherencia comunitaria, y se aboga por unos marcos normativos sustentados en el diseño, arraigados en el urbanismo histórico y que hagan hincapié en la variación, la sostenibilidad y la cocreación. Las conclusiones muestran cómo una densificación renovada puede crear barrios dinámicos, asequibles y respetuosos con el medio ambiente que contrarresten la expansión urbana y promuevan comunidades sólidas tanto en contextos suburbanos como rurales.

Muitas cidades na Noruega são caracterizadas por uma diversidade habitacional limitada e áreas residenciais dependentes da circulação automóvel. Em contrapartida, várias cidades europeias estão a desenvolver bairros com uma maior densidade habitacional mas de baixa altura, com base em processos participativos nos quais os residentes têm poder de decisão. Esses processos resultam em planos de ordenamento públicos e códigos de projeto detalhados que definem o que pode ser construído. Mas isso pode ser adaptado às áreas residenciais existentes? Este estudo explora novos modelos para a densificação suburbana e de pequenas cidades na Noruega, desafiando as percepções negativas da densificação suburbana. Criticamos as ferramentas de planeamento atuais por não garantirem a integridade arquitetónica e a coerência da comunidade, e defendemos enquadramentos regulamentares orientados para o design, enraizados no urbanismo histórico e que enfatizam a diversidade, a sustentabilidade e a co-criação. As nossas conclusões mostram como a densificação reimaginada pode criar bairros vibrantes, acessíveis e ambientalmente sustentáveis que contrariam a expansão descontrolada e promovem comunidades fortes, tanto em contextos suburbanos como rurais.

Klyngetun

We Norwegians see ourselves as a people who thrive best alone on a small farm high on a mountaintop—or deep in a valley. The documentary series *Der ingen skulle tru at nokon kunne bu* (*Where No One Thought Anyone Could Live*) has run for 23 seasons, portraying the lives of “people who live far from the city but close to the dream of a simpler life, in touch with nature.” For a country of 5.5 million inhabitants, it is telling that the 2024 season averaged a million viewers per episode.

This self-image is relatively new in a historical context. In 1821 a land redistribution act was passed by the Norwegian parliament (Randal 1995) to reorganize land ownership, particularly in clustered farm settlements (*klyngetun*), where people would own scattered plots—some were said to own just half of an apple tree. In many cases, people took their houses with them, moving on to more practicable plots elsewhere. Over about a hundred years, most abandoned life in the *klyngetun*—a dense village structure with over 600 years of history, where people shared tools and farm buildings—for the cities and single-family homes on large lots, safely distanced from their neighbors.

How is Land Being Densified Today, in City Districts and Rural Communities?

Areas of detached housing in Norwegian cities are continuously being densified. Usually this happens when single-family homeowners subdivide their plot, allowing a new house to be built—also at a safe distance. Other times, developers buy a house with a large lot, knock the house down, and then build several new units—sometimes even mid-rise apartment buildings—often completely at odds with the character of the neighborhood. In most cases, the new homes are sited in the middle of the plot, and while this does increase the number of housing units, it rarely leads to functional diversity or lively street life.

This is described by the term *eplehagefortetting*, which can be translated as “infill development in single-family garden plots.” It has gained a negative connotation, largely because the new buildings are often of different types that clash with the surrounding ones.



Axonometric view of buildings designed according to the building code for Fetsund (Fragment)

While working on a zoning plan for the center of the small town of Elnesvågen in Hustadvika municipality, near Molde on the west coast, we discovered that despite clear national guidelines promoting integrated land use and transport planning, the municipality was selling single-family plots in municipal housing developments located at a driving distance from public services. This was not surprising, but it revealed an opportunity: if municipalities already have a tradition of developing housing themselves, might it also be possible for them to establish developments within walking distance of the town center, creating dense, low-rise neighborhoods with car-free streets and perhaps even small commercial premises—hair salons, carpenters’ workshops, or convenience stores—on some of the ground floors?



Site Plan

The Resident-Designed 10-Minute City

Over the past ten years, through various planning and research assignments, we have explored models for densification using small-scale housing along car-free streets. While preparing the book *The New Neighborhood*, in collaboration with Saher Sourouri, spokesperson for Norway’s Architectural Uprising (Gersten 2024), an organization that describes itself as “a people’s movement against the continued uglification of our cities”, we also learned of various small towns and residential areas developed through participatory processes—such as Adam Architecture’s master plan for Field Farm in Somerset, England, which resulted in a detailed design code—and neighborhoods partially designed and even built by the residents themselves, such as the vibrant community of Catfiddle Street in North Carolina. These are two very different projects, yet both illustrate how development based on a design code can foster variation. And variation and diversity are key concepts here. For a number of reasons, neighborhoods with convenience stores and carpentry workshops are often dismissed as relics of the past. But perhaps this perception is also shaped by the way we currently build—favoring large commercial units tailored for large, well-capitalized actors.

On looking for alternative development models for today’s often car-dependent Norwegian towns, we find few examples. Drøbak, Sogndal, and Lillehammer are some smaller Norwegian towns that have partially escaped the typical postwar model of urban centers with fragmented single-family housing estates at a driving distance. But where these few towns have fared better, it is often due to neighborhoods and buildings preserved from the nineteenth century. An examination of postwar development in rural Norwegian districts reveals few, if any, examples of concentrated or cohesive settlement patterns. This may give the impression that car dependency and spatial fragmentation are inevitable in rural areas—a kind of natural law. And car dependency today appears so deeply entrenched that reversing the trend may seem impossible.



Development in Fetsund from the forest (Fragment)



Development in Fetsund from the forest (Fragment. AI Version)

A climate committee established by the Norwegian government in 2024 to develop a roadmap for achieving carbon neutrality by 2050 found, in its chapter on spatial planning, that altering settlement patterns formed over generations is difficult due to the phenomenon of path dependence (whereby past events constrain current ones). What is clear is that change must be driven by the residents of rural areas themselves. In the absence of contemporary role models, we may look to the past and consider what regulatory mechanisms led historical town centers in places like Lillehammer and Drøbak to develop so differently from modern ones—and why these older environments remain attractive to many Norwegians. At the same time, we need to develop new models in which structure, urban form, and architecture are the primary guiding parameters.

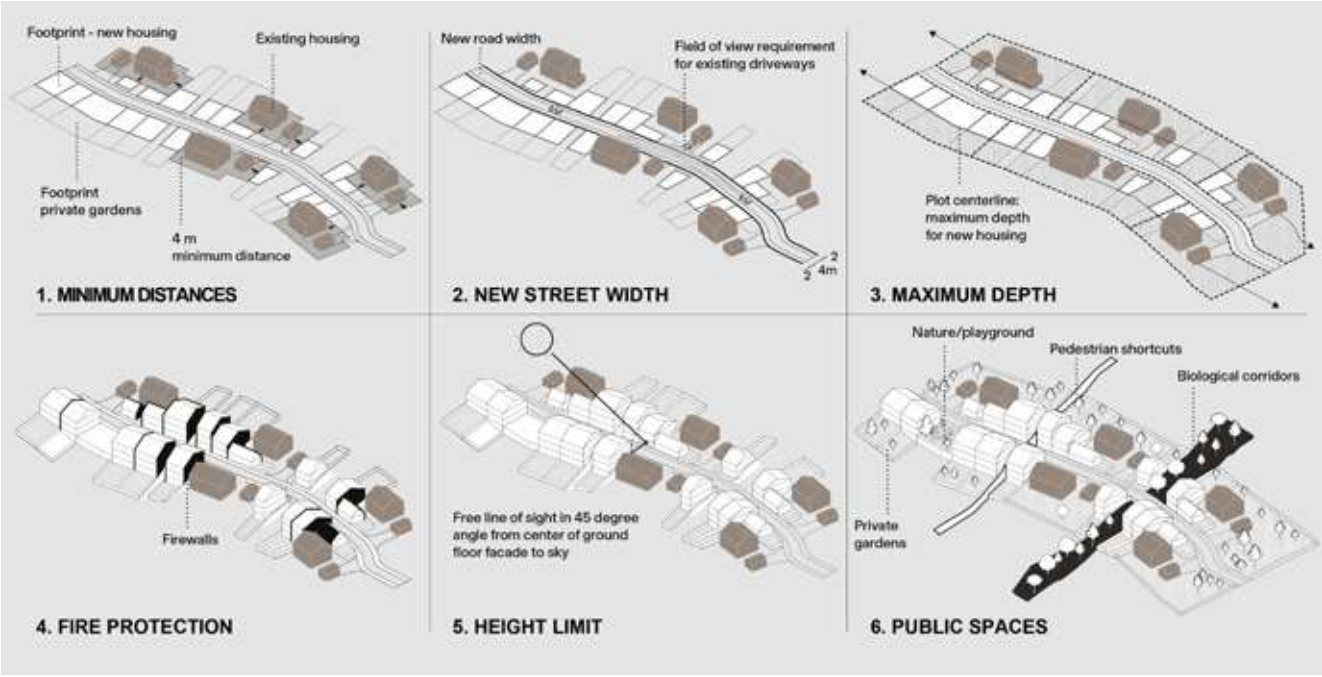
A Word about Strategy

In spring 2024, the architecture firm Fragment with partners including ASAS Arkitektur, At-Site landskapsarkitekter, and NIKU conducted a study for the municipality of Lillestrøm and the small town of Fetsund. The assignment is a “parallel commission,” in which two or more consultants explore issues for the municipality, which may then draw freely on the various studies. In Fetsund the task was to look into the possibilities for densification and development, taking into account flood risk and other considerations. In addition, there was a clear requirement for traditional architecture.

Using mapping exercises accounting for flood risk, biodiversity, and farmland, we identified areas to be recommended for development and drew up design guidelines for small-scale densification on single-family plots. We focused on a hillside above the current town and called the proposal *Øvrebyen* (Uptown), envisaging development with small traditional houses and apartment buildings of up to five stories.

In rural Norway, construction costs are often higher than a home’s potential sale price, which makes it difficult for many to secure a mortgage, as banks rely on the property’s future value as collateral. It is not uncommon for people to build all or part of a home themselves. So could we make this easier for them? And could we also create a model for a compact neighborhood with small houses along a street, allowing for various development models and offering an alternative to detached houses and apartment buildings?

A design code for Fetsund based on the Planning and Building Act and technical building regulations (Fragment)



Development in Fetsund looking uphill (Fragment)



Development in Fetsund looking uphill at dusk (Fragment)

A Design Guide for Small Houses on Car-Free Streets

In the Fetsund assignment, the key strategy for establishing structured and dense small-house neighborhoods has been to create narrow, car-free, one-way streets—often based on existing roads—with new buildings along them, facing the street. This involves a simple, comprehensible strategy and format, with as much of the plot as possible being reserved for backyards and attractive, quiet rear sides. Spacious backyards are familiar from cities like London, where row houses, even in dense urban areas such as Hackney, often have gardens at least as large as those of many detached homes in Norwegian developments. Although this strategy may seem simple, it is in fact contrary to most contemporary urban planning in Norway, which spreads buildings as evenly as possible, on the assumption that distance between houses is always an advantage. But we want to return to the compact town.

In Fetsund we started with the existing single-family plots in our area and developed a set of rules based on the Planning and Building Act and current technical regulations. This led to the identification of potential infill plots along and adjacent to existing streets or on new streets provided for the new development. Parking is located within walking distance in small garage facilities, which can have charging stations for electric cars and bikes and could be converted into housing or to

other functions in the future. In addition, the strategy includes paths, bio-corridors for greenery with insects and other wildlife, playgrounds, and pocket parks.

A zoning plan should also allow homeowners to establish a shop or other business on the ground floor of their buildings. This is something we are familiar with from residential areas in rural Norway, where it is common for a detached house to have a hair salon or plumber’s shop at ground level. This is also common in cities known for their diversity and vibrancy such as Tokyo, where there are whole districts of small houses in which the zoning allows homeowners to establish ground-floor businesses.

In the future, we will probably share more, and the apartment buildings along the car-free residential streets we have developed for Fetsund are also suited to co-housing communities, where people may live in relatively small apartments and share facilities with their neighbors, such as guest rooms, a community center, activity rooms, workshops, or a sauna. Many of these shared spaces can be located at ground level along residential streets, helping to bring life to the neighborhood. On the way home from the train station you pass neighbors having dinner or coffee while the children play in an activity room.

A Design Guide for Traditional Contemporary Architecture in Fetsund

The buildings we envisaged in Fetsund were shaped by the existing plots and the rules we drew up. For the facades, we drew inspiration from buildings dating from the late nineteenth century and complemented this with a color palette based on historical color use and local variations, along with considerations concerning materials, building heights, roof shapes, and window placement. Apart from a cornice between the first two floors and windows with mullions, there is little that is particularly anachronistic, resource intensive, or complicated. For this too, there is historical precedent. The classic Grünerløkka district in Oslo was developed from the late 1800s to the early 1900s with facade details imported ready-made from factories in the Netherlands and Germany, because this was required by the local regulations. On such simple premises, dense urban and street spaces can quickly be created with a richness reminiscent of towns like Drøbak, Lillehammer, or Bergen, or indeed Grünerløkka.

Development in Fetsund looking downhill (Fragment)



The rules aim to strike a balance between freedom and a clear framework that respects both the neighborhood and the surrounding nature. We believe in creating a structure and a community-driven design guide, and allowing the built environment to grow in accordance with these guidelines.

Planning for the Porous Rural Town

In 1962, in *Supports: An Alternative to Mass Housing*, N. John Habraken introduced the concept of the “open building”, in which a floor plan can be freely designed and redesigned independently of the structural system and vertical infrastructure. He later applied this thinking to urban planning, proposing that zoning plans could serve as open frameworks into which buildings are inserted. As we develop a system for incremental growth in Fetsund, we are building on Habraken’s ideas. We believe that an “open building in a porous urban plan”, to borrow Richard Sennett’s phrase, is not just a way cities were once designed but also the way they can and should be designed today.

Timber-frame houses began to be assembled with screws at the start of the twentieth century. Before that, they were built using logs or joined timber frames that could easily be taken apart if the house had to be moved. Many neighborhoods in Norway’s cities—such as Oslo, Bergen, or Stavanger—consist of houses relocated from the countryside. Most people also had carpentry skills, so extensions and additions were common and typically built by homeowners themselves. An architect was rarely hired for such work, so a knowledge of building traditions and styles was necessary in order to design something acceptable to the community. And people managed to squeeze in houses wherever there was space. When the Rodeløkka district was established as a dense Oslo suburb in the late nineteenth century, almost all of its inhabitants came from the neighboring county of Akershus, and many brought their dismantled houses with them.

If combined with strong participatory processes for co-creating a design code rooted in adapted traditional architecture, we believe this approach to urban development is robust and relevant to many contexts.

Havrå clustered farm settlement (*klyngetun*) on Osterøy, outside Bergen, Norway (Store Norske Leksikon)





Catfiddle Street, Charleston, developed and built by residents according to a design code they drew up themselves (*Det nye nabolaget*, Urban Ergonomics)

What Might Such a Participatory Process Look Like?

There are various ways to facilitate this type of development. The most flexible model, while still ensuring that a district has structure and infrastructure, may be a version of what we see in parts of Homeruskwartier in Almere (the Netherlands). The zoning plan for this area is heavily influenced by Habraken’s ideas about separating infrastructure from the buildings within it. The city develops an area plan defining plots and their sizes, the street network, and some social infrastructure. Utility infrastructure is laid in the ground, allowing those building homes to easily connect to it. Plots are sold mostly at a fixed price, and people either self-build, hire an architect, or call upon a prefab supplier.

In Homeruskwartier this strategy has resulted in a patchwork of styles, and the look of the district might deter others from adopting a similar approach. But if the process had begun with community involvement and the creation of a binding design guide—perhaps one that allowed for variation, as a balance between freedom and coherence is key—the outcome could have resembled our project for Fetsund.

This is about creating spatial diversity in new residential areas—densification models that respect the existing built fabric. A strategy supported by a rule-based framework for practical participatory processes, resulting in tangible outcomes.

Most of the newly built urban areas with traditional architecture that we studied for our book *Det Nye Nabolaget* were developed in this way from the very beginning of the zoning phase. We believe in an

approach that begins with a plot structure, preferably connected to the existing town or else designed as an independent neighborhood with streets and squares. This should be followed by a rule set that ensures buildings comply with technical regulations and the Planning and Building Act, along with a resident-led design guide that both respects local building tradition and enables variation.

Recreating a Design Language for Norwegian Towns

Our work for Fetsund demonstrated how it is possible to create a dense, low-rise small town on existing single-family plots. The same strategy can be applied in neighborhoods and urban areas seeking higher density and diversity in functions and types. It is crucial that the participatory process used to establish the rules be grounded in the local community and include all those who care about the place. Equally important is that this scale should allow for a wide range of developers—from families and co-builders to smaller professional developers. The strategy must also comply with the Planning and Building Act, technical regulations, and both national and local sustainability goals. A new traditional architecture should aim for the highest standards of sustainability—and of quality of life for residents.

We believe it is essential to build a culture in which people have a greater sense of ownership in urban development, where they understand the possibilities and where densification models put them in control. In Norway’s cities, urban development is dominated by large property developers, who have to prioritize profit so as to be able to afford new land purchases. But developers do not necessarily have the competence to shape attractive towns. A glance at how Norway’s rural towns developed from the 1960s onward—when the car was allowed to set the terms and traditional building culture was abandoned in favor of cheaper systems, concrete and aluminum—shows the result: places young people tend to want to leave, often due to the architecture.

Sprawl Repair Manual by Galina Tachieva looked at the vast parking lots of American suburbs and small towns and showed how siting new buildings in these asphalted voids could help create vibrant streets, squares, parks, and other public amenities. We have often used this book to illustrate our arguments, because it applies to many Norwegian towns as well.

Field farm by Adam Architecture (*Det nye nabolaget*, Adam Architecture)





Aerial view of Fetsund (Fragment)

What we lack is a design language for the future of small towns in Norway—walkable, diverse rural towns, ideally within reach of the capital or other cities by train. Today it is not only the lack of job opportunities that drives young people away from rural areas—it is also the lack of urban quality. Municipalities and landowners often develop plots in isolation, and what gets built tends to repeat the formulas of the past 60 years, particularly since the end of car rationing in 1960, when the functionally divided town truly took hold.

Landowners' Interests

Suburban and rural development in Norway is also shaped by strong landowners' interests. Farmers often engage in local politics so as to influence planning affecting their land. In cities, smaller property developers tend to dominate, specializing in buying large plots with single-family homes and rezoning them for densification. In Norway, anyone may propose a zoning plan.

This means that landowners often initiate zoning plans themselves, resulting in piecemeal, project-by-project development that municipalities struggle to supervise. Even cities find it difficult to maintain the quality of new housing areas as compared to older neighborhoods.

We believe it is time for a new planning regime that prioritizes small-town densification and thoughtful design. This may counter the trend toward fragmented, car-dependent environments by means of offering modern village-style living: space-efficient homes with private gardens, nature access, and shared amenities, all within walking or cycling distance of town centers. Such developments could make rural centers more appealing, reduce pressure on urban housing markets, and enable faster, more affordable construction with lower regulatory risk. With time, *eplehagefortetting* could come to represent beautiful, inclusive neighborhoods—places people want, and can afford, to live in. We believe the strategy for densifying single-family home plots in Fetsund is a flexible and attractive model for development.



House moved from Forøya in 1965. Houses were moved with government support from islands with few inhabitants to more populated places. (*Hus på vei*, J. Engvig)

References | Referencias | Referências

Eriksen, Arild; and Sourouri, Saher. 2022. *Det nye nabolaget*. Oslo: Fragment.

Gersten, Jennifer. 2024. A Nordic Revolt Against ‘Ugly’ Modern Architecture. *Bloomberg*. <https://www.bloomberg.com/news/features/2023-08-01/a-scandinavian-uprising-against-modern-architecture> (consulted on 03/03/2025).

Habraken, N. John. 1972. *Supports: An Alternative to Mass Housing*. London: The Architectural Press.

Randal, Aud. 1995. *Eivindvigens anden Skaber. Niels Griis Alstrup Dahl (1778–1852)*. <https://bora.uib.no/bora-xmlui/bitstream/handle/1956/12894/Aud%20Randal.pdf?sequence=1&isAllowed=y> (consulted on 02/03/2025).

Sennett, Richard. 1970. *The Uses of Disorder: Personal Identity and City Life*. New York: Knopf.

Tachieva, Galina. 2010. *Sprawl Repair Manual*. Washington DC: Island Press.

Wikipedia. s. f. *Path dependence*. https://en.wikipedia.org/wiki/Path_dependence (consultado el 03/03/2025).

Biographies | Biografías | Biografias

Arild Eriksen

Arild Eriksen (b. 1973) is an architect and author. He founded the architecture firm Fragment in 2018 in order to engage in resident-driven housing and urban development. In 2022 he published the book *The New Neighborhood* for the Oslo Architecture Triennale together with Saher Sourouri, spokesperson of Norway’s Architecture Rebellion. The book was broadly about how to create cities and places with resident participation and design codes..

Kristoffer Røgeberg

Kristoffer Røgeberg (b. 1989) is a Norwegian architect and employee at Fragment. He was responsible for the building development strategy for Fetsund and in 2025 he has been working on the creation of an architectural handbook for Tønsberg, Norway’s oldest town.

Lucien Steil, Victoria Schulz-Daubas

Selected Counterprojects in Brussels

Selección de contraproyectos para Bruselas

Seleção de contraprojetos para Bruxelas

Abstract | Resumen | Resumo

This article explores the role of counterprojects as didactic tools for challenging destructive modernist practices and proposing alternative visions rooted in tradition and civic identity. Drawing on the legacy of Léon Krier and Maurice Culot, it criticizes the superficiality of much contemporary “sustainable” architecture and the erosion of the public realm into “anti-space.” It situates the emergence of the growing “Architectural Uprising” within broader cultural, political, and ecological movements, emphasizing grassroots resistance and education for traditional design. Through examples in Brussels such as the Blaton Tower, the Maison du Peuple, and Place de Brouckère, it explores how adaptive reuse, classical language, and urban reconstruction may restore continuity, beauty, and permanence to the Belgian capital’s civic fabric.

Este texto examina el papel de los contraproyectos como herramientas didácticas para cuestionar las prácticas modernas destructivas y proponer visiones alternativas arraigadas en la tradición y la identidad cívica. A partir del legado de Léon Krier y Maurice Culot, el artículo critica la superficialidad de gran parte de la arquitectura “sostenible” contemporánea y la erosión del ámbito público hacia el “anti-espacio”. Sitúa el surgimiento del “Architectural Uprising” (rebelión arquitectónica) dentro de otros movimientos culturales, políticos y ecológicos más amplios, y destaca la resistencia popular y la educación en favor del diseño tradicional. Mediante ejemplos tales como la Blaton Tower, la Maison du Peuple, y la Place de Brouckere, el texto analiza cómo la reutilización adaptativa, el lenguaje clásico y la reconstrucción urbana pueden devolver la continuidad, la belleza y la permanencia al tejido cívico de la capital belga.

O texto explora o papel dos contraprojetos como ferramentas didáticas para desafiar práticas modernistas destrutivas e propor visões alternativas enraizadas na tradição e na identidade cívica. Baseando-se no legado de Léon Krier e Maurice Culot, o artigo critica a superficialidade de grande parte da arquitetura “sustentável” contemporânea e a erosão do domínio público em “anti-espço”. Enquadra o surgimento da “Revolta Arqitetônica” dentro de movimentos culturais, políticos e ecológicos mais amplos, enfatizando a resistência popular e a educação tradicional em design. Através de exemplos como a Torre Blaton, a Maison du Peuple e a Place de Brouckere, o texto mostra como a reutilização adaptativa, a linguagem clássica e a reconstrução urbana podem restaurar a continuidade, a beleza e a permanência do tecido cívico de Bruxelas.

The late Léon Krier said that “the best criticism is a project,” and we have found there to be much truth to this in practice and teaching. Counterprojects are indeed both didactic and poetic tools for thinking “out of the box,” overcoming ideological and administrative hurdles in design, understanding the potential of a place through the design process, and proposing better ways of building on our fragile and threatened planet. Counterprojects educate our memory and imagination and inspire change in keeping with the culture of places and people rather than disrupting the natural metabolism of town and countryside.

On observing the built environment and its often vainglorious pretension to fame, as well as the surfeit of glitzy, award-winning “sustainable” architecture, we should pause and breathe deeply. Though celebrated, this vaunted sustainability is all but a product of the biased algorithms of the industries dominating the building market with their array of unsustainable products and self-serving specifications. The fame of many of these acclaimed “eco-buildings” infringes common sense and good taste.

So, alas, does the failure to maintain or provide decent spaces and buildings in the public realm, symptomatic of the erosion of both life and identity in our city centers. The reality of such centers becoming business or shopping districts, with many buildings occupied at ground-floor level and empty above, is dispiriting. A pervasive décor has trivialized and decomposed the public realm into a landscape of “anti-space,” making any emotional, sensorial, or mnemonic connections between community and place all but impossible.

As “thinking and building” are now notoriously separated from “dwelling” (Heidegger 1971), city-dwellers, and also to a larger extent designers, craftsmen, and builders of goodwill, are now excluded from participating in the wholesome process of city-building. As a consequence, many (but not all, fortunately) have given up, seeing that political decision-making, city-planning and urban architecture have been usurped by big business, the building industry, and the bureaucratic apparatus set in place to make sure that the *città felice* and “good government” remain excluded from city-building rationale.

This is where the Architectural Uprising or Rebellion grassroots movement, launched in Scandinavia largely over social media, comes in. It spread like wildfire and is now present in almost all European countries as well as the US, India, and Brazil. It aims to resist the “uglification” of the built environment—and there is little need to explain what this means in any language or for research on the subject, as the brutal reality is self-evident in contemporary building culture. The popular verdict is almost unanimous and only well-established entitlement and the backing of financial, political, cultural, and industrial dynasties has saved mainstream architectural modernism from dissolution. Polemics and protests as well as counterprojects and media presence highlighting architectural eyesores or examples of accomplished repair and reconstruction have had notable success in Scandinavia, halting destructive modernism and having it replaced with contemporary traditional work.

A short history of the surprising but also logical emergence of the Architectural Uprising and Rebellion movement suffices to show why it eventually had to happen in Scandinavia and also how it builds largely on a tradition of rebellion and insurgence started by Maurice Culot and Léon Krier in the late seventies and early eighties under the banner of *Résistance Industrielle*. We should also mention the political and intellectual support and cultural inspiration provided by King Charles III (formerly the Prince of Wales), whose insightful *A Vision of Britain* campaign, ecological stewardship, and educational endeavors (the Prince of Wales’s Institute of Architecture, Prince of Wales’s Urban Design Task Force, Prince’s Foundation for the Built Environment, etc.), made a durable impact on contemporary architectural culture and prompted the development of a larger international movement of traditional architects and urbanists. Initially promoted by Gabriele Tagliaventi in Bologna with *A Vision of Europe* and its influential gatherings and conferences, it was later expanded with the creation of INTBAU at the initiative of Robert Adam in the UK, again with generous sponsorship from supporters in Sweden and Norway. INTBAU was a monumental endeavor of developing the emerging traditional architecture and urbanism movement over all five continents under the patronage of the former Prince of Wales. Besides its remarkable success in creating a network across both Western and non-Western countries, offering educational events



1. *Bruxellisation*: Tour Blaton in Brussels (Wikimedia Commons)

2. This early proposal for Sandakerveien 58 B/C in Oslo was rejected by the local authorities in 2014 (MAD Arkitektur)

3. The building design was then revised by the same firm (MAD Arkitektur)

outside institutional and academic confines, INTBAU has also substantially expanded its interests, catering for vernacular cultures, crafts, and natural materials and techniques as well as pressing issues of social, gender, and ethnic equity and the empowerment of marginalized cultures.

Interestingly, the Climate Rebellion and the influence of the Swedish activist Greta Thunberg, as well as the seminal pamphlet *Time for Outrage* (*Indignez-vous*, 2010) by the French diplomat, Resistance member, and concentration camp survivor Stéphane Hessel, may all have contributed to the Architectural Uprising. But many other sporadic movements of civil disobedience, and also the rise of populism in today’s fragilized political and sociocultural environment, have facilitated the emergence of initiatives such as the Uprising on the margins of established practice and academia. A growing number of summer schools teaching traditional architectural and urbanism have further popularized resistance to the global rage of destructive modernism. Many young professionals and activists have been initiated into classical and traditional architecture and urbanism in these schools, mostly organized through INTBAU chapters, in Sweden (Axel Johnson Foundation), the UK (University of Buckingham, University of Cambridge, King’s Foundation), Spain and Portugal (Traditional Building Cultures Foundation), Belgium (La Table Ronde de l’Architecture), etc. Academia and the architectural establishment have yet to engage with the widespread discontent at the desolate architectural output of institutionalized modernism, seeming confident that it is just another trend.

Further to the revolt of citizens of all ages, albeit energized by the young, converging and flourishing on social media, the well-established pedagogy of the School of Architecture at the University of Notre Dame has since 1980 been offering a paradigm of faith and hope and also solid didactic content and methodological intelligence to these various endeavors. The remarkable institutional apparatus of INTBAU, but also the expertise created by CNU (the Congress for the New Urbanism) and ICAA (the Institute of Classical Architecture and Art) in the US, have helped disseminate traditional know-how as well as a growing body of academic expertise. This has empowered the Architectural Uprising and facilitated the evolution of indignation into a dynamic of positive change. The plethora of extraordinary student work and exemplary professional output of contemporary traditional architecture demonstrate the validity and efficiency of the methods and pedagogy embraced by a growing number of practitioners, academics, and patrons. We seem to be ready for an era of urgent counterprojects, and we are certainly eager for action. Rather than being disillusioned bystanders, we aim to proactively design impactful projects against uglification.

There follow a few examples of counterprojects designed in *charrette* mode during the 2021 La Table Ronde Summer School in Brussels.

Tour Blaton: Call for Counterprojects for the Blaton Tower

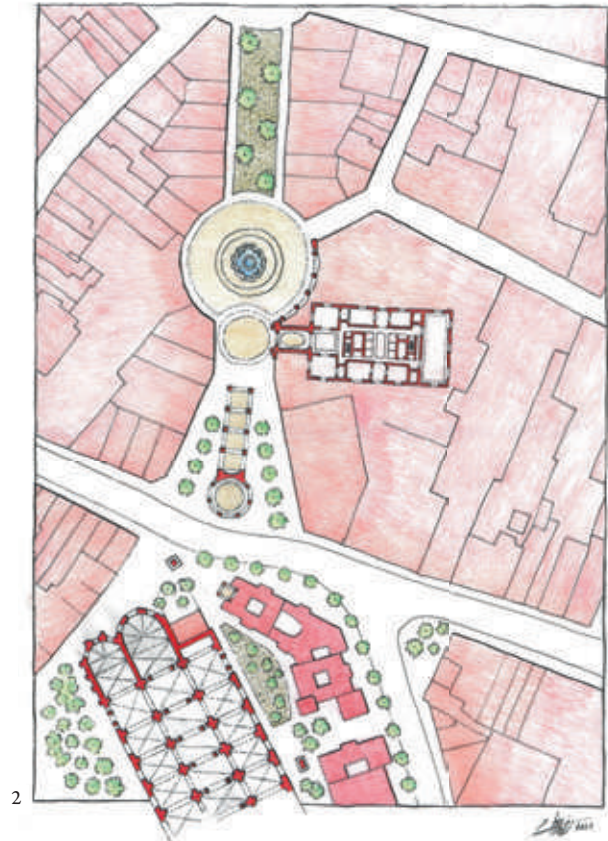
La Table Ronde de l’Architecture, with the support of Maurice Culot, requests proposals for a counterproject to rethink and transform the Blaton Tower, Brussels, built in 1968 in place of Victor Horta’s masterly House of the People. This 26-story, 86-meter-high eyesore is emblematic of Bruxellisation: a methodical destruction of heritage for replacement with overwhelming modernist buildings. Today, a parenthesis—that of modernism—is coming to a close. Demolition is inviable, financially and environmentally, so we ask the Brussels city authorities to consider transforming and embellishing this tower that disfigures the Sablon townscape.

Our counterprojects opt for an adaptive reuse strategy: a transformative rehabilitation of the existing structure. Victoria Schulz-Daubas proposes a rather refined embellishment with few structural

1. Tour Blaton in the historic center of Brussels (La Table Ronde de l’Architecture)

2. Nolli plan of the repurposed Tour Blaton with masterplanning suggestions: a new monumental fountain in a circular square, a public loggia, student housing, etc.

3. Tour Blaton counterproject (acrylic and colored pencil on photo print)



changes, whereas Lucien Steil prefers more radical alterations: cutting out every other floor to accommodate higher ceilings and vertical windows, and giving the tower an elaborate “crown.”

This adaptive transformation also involves adding fine pilasters, string courses, ornamental reliefs, and a monumental cornice to give the tower hierarchy, legibility, elegance, massing, and texture. The inside walls are reinforced with pilasters and consolidated with a skin of Porotherm bricks. A double layer of cork sheeting enhances thermal wellbeing and acoustic quality and makes for a warm and breathable wall structure. Tour Blaton will be repurposed as the new headquarters of the École de la Reconstruction de la Ville Européenne (School for the Reconstruction of European Cities), devoted to the study and teaching of contemporary traditional crafts, architecture, and urbanism across Europe. The tower will become a landmark in a renaissance of good urban architecture, gracing the European capital and standing as a beacon of the resilience of historic European culture and the art of building.

Maison du Peuple: *Entrée Libre*

Victoria’s proposal embodies the ethos of achieving maximum impact through minimal intervention. Rather than altering the tower’s structure, this design works with existing features and adds subtle enhancements, minimizing resource consumption and waste generation.



Maison du Peuple, *Entrée Libre*

The approach is twofold: visually integrating the building with its traditional surroundings by incorporating ornamental elements and enhancing its appeal to the public by reimagining the ground floor with arched openings, niches, and light.

Classical architectural elements such as skirtings, friezes, parapets, and figurines are strategically introduced to accentuate the base and crown. While most of the tower’s facade remains unchanged, a layer of blue paint on the top row of windows pays homage to the blue triglyphs of ancient Rome. This counterproject aims to transform the tower into a welcoming landmark, leveraging its height to benefit the entire city, indeed inviting everyone in, while minimizing environmental footprint.

The Making of a Square: Place de Brouckère, Brussels

Place de Brouckère is a large public space in the center of Brussels enclosed by well-proportioned, ornate, mixed-use buildings of five or six floors, of which many are vacant or undergoing thorough (or brutal) renovation. The north end is elegantly occupied by a fine landmark building, a former hotel, and the historic fountain which had been in front of it has been removed and replaced with

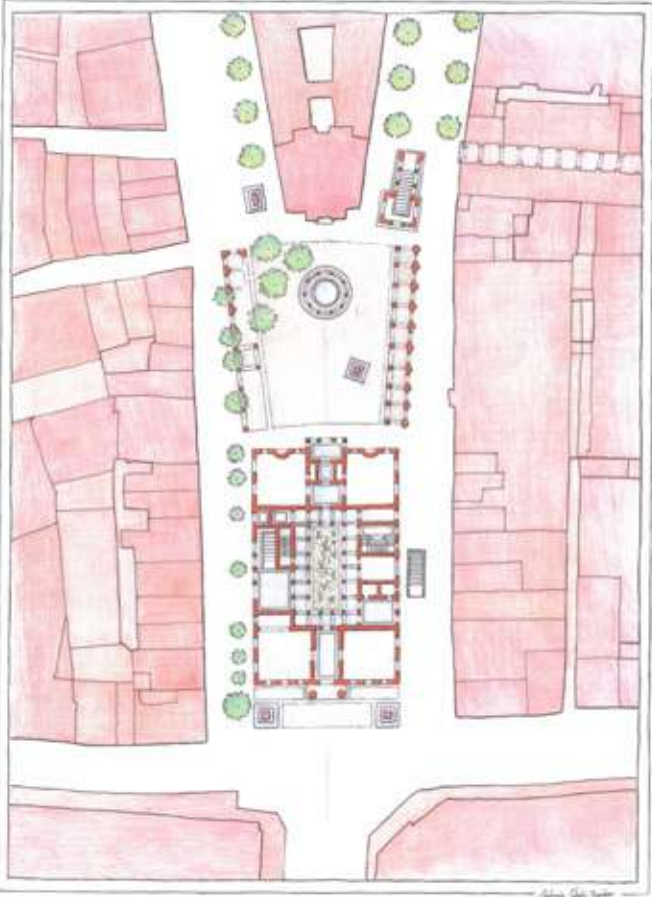


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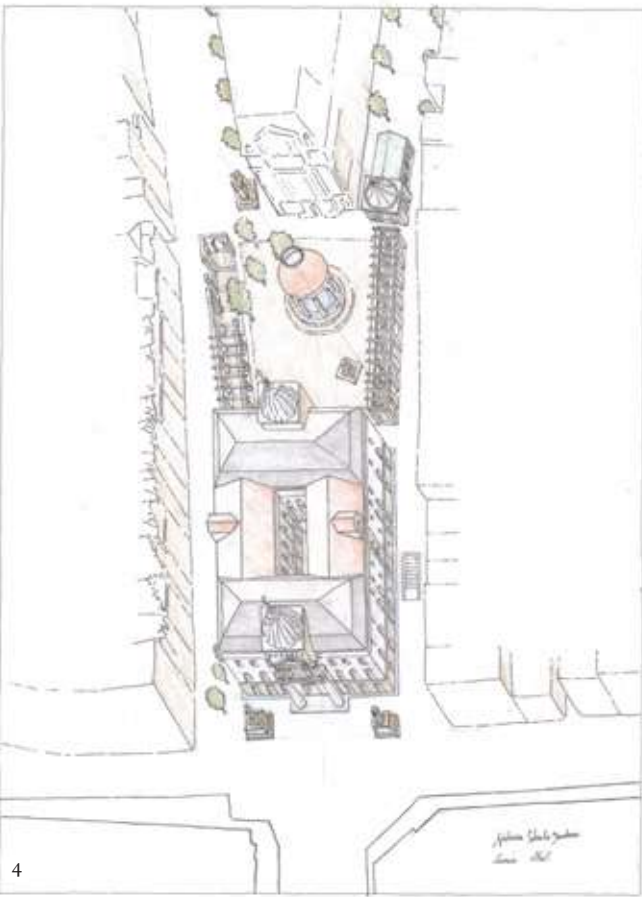


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- 1. Place de Brouckère, Brussels, 2021
- 2. Place de Brouckère in 1930 (Wikimedia Commons)
- 3. Plan of the Place de Brouckère counterproject
- 4. Axonometric view of the proposed reconfiguration of Place de Brouckère



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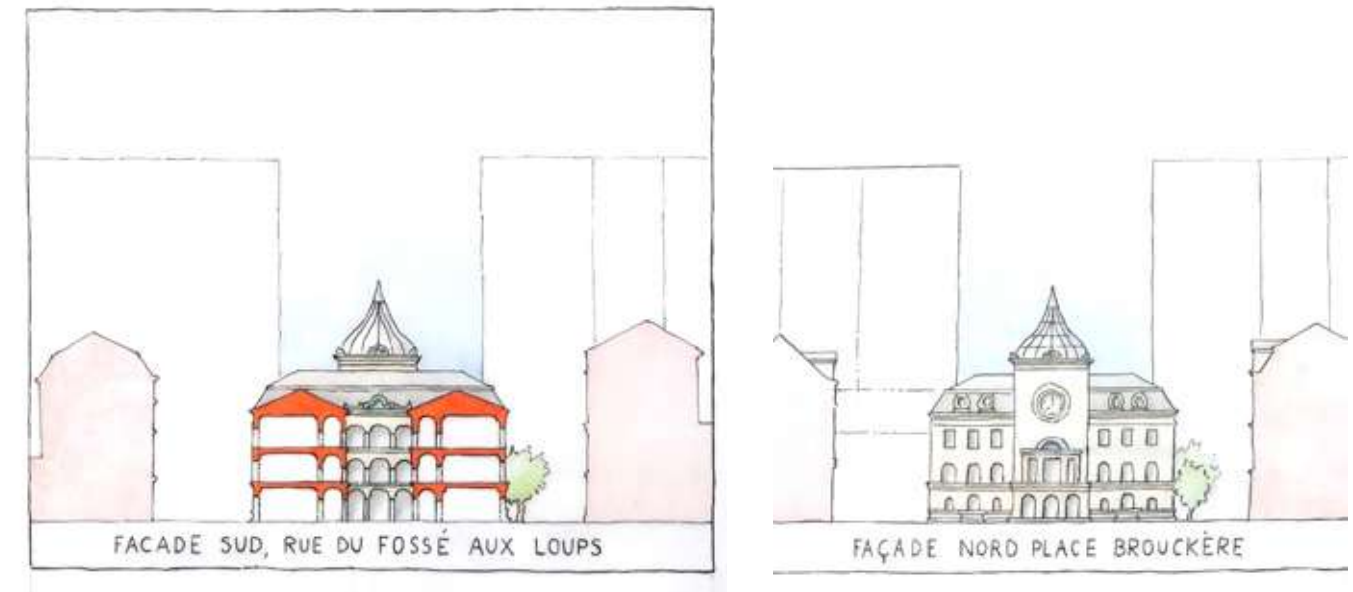


Maison du Peuple, *Entrée libre*: main facade seen from Boulevard Anspach

irrelevant pavement water spouts. Another prominent hotel stands in the eastern flank, and there are subway entrances on either side and at the northeast end. Place de Brouckère is approached from Boulevard Anspach at the open south end between two unattractive high-rise buildings forming an uninviting gateway. The overall impression is of overbearing scale, emptiness, and lack of enclosure and character. There is little sense of place, identity, or grandeur.

Our proposal inserts a large public building on the south side of the square, creating a monumental though welcoming frontage aligned with Boulevard Anspach. Sculptures of dancing figures symmetrically frame the central entrance. The building is organized around a porticoed garden courtyard and has a permeable ground floor with reception, security, shops, subway stairs and elevators, and a variety of premises devoted to cultural activities and associative life. This floor can be crossed in all directions. The upper floors contain ballrooms, yoga and meditation halls, meeting venues, and classrooms. The top floor has apartments for visiting artists and the building manager.

The reconfigured square features a colonnade along the east flank and an arcade with a false ruin on the west side. A circular *tempietto* over a fountain along with sculptures and a new subway pavilion further enhance the square's new identity as well as offering new perspectives and artistic and architectural highlights and references.



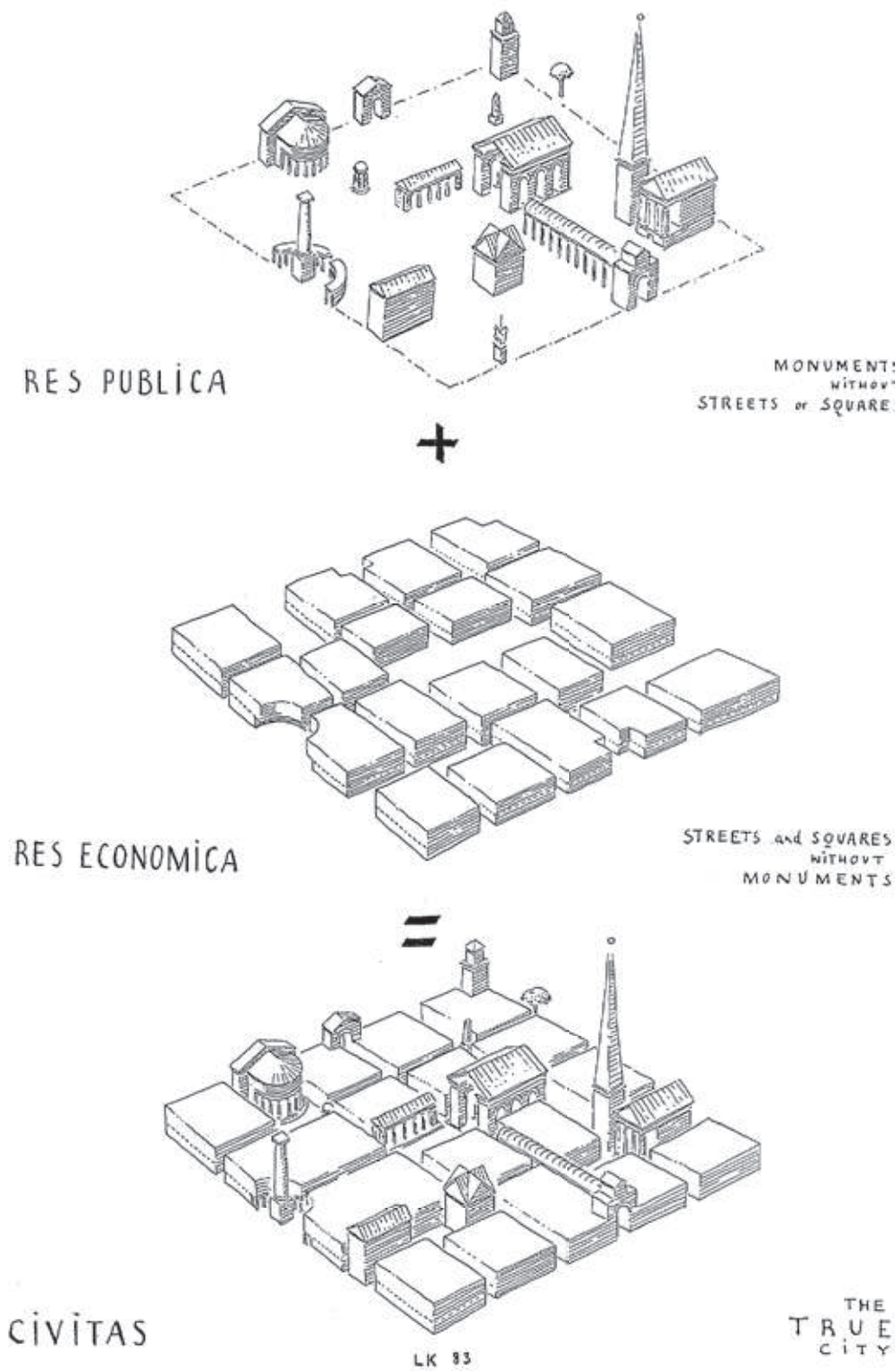
North elevation and east-west cross-section

Relevance of the *Res Publica*

Lewis Mumford exalted the city as a place where “strangers live in peace together,” and Richard Sennett posits the public realm as a stage on which citizens become actors of civility. In *The Human Condition*, Hannah Arendt says “Only the existence of a public realm and the world’s subsequent transformation into a community of things which gathers men together and relates them to each other depends entirely on permanence. If the world is to contain a public space, it cannot be erected for one generation and planned for the living only; it must transcend the life-span of mortal men.”

Unfortunately, much of contemporary city-building has disregarded or dispensed with the traditional dialectic between public and private realms. The “art of building cities” has been replaced with a modernist dystopia inspired by functional and social zoning codes, with disruptive policies and practices. Rather than the public realm as an identifiable *caput mundi*, an enclosed civic “void” where the life, memory, and endeavors of urban communities can unfold, evolve, and flourish harmoniously, the *res publica* has been commodified as an arena for either cheap entertainment or plain boredom and suburban melancholy. The diversity, order and disorder, and clear geometric, proportional, and phenomenological experience of public space has shifted into a realm of “anti-space,” with an ephemeral array of gadgets, ridiculous urban furniture, and random installations. So let us conclude by highlighting the key components of the traditional city with the necessary organization of and relationship between the *res publica* and *res economica*, as often pointed out by Léon Krier. His admirable argument states that the “true city” is achieved only once the public and private realms are harmoniously integrated, forming what in antiquity was known as an *urbs* (the physical form of the city), fostering and facilitating *civitas* (its social, political, and economic fabric). The destruction of the public and civic realm wipes out the identity of places and communities—hence the urgency of both counterprojects and projects of reconstruction!

Our Brussels counterprojects thus endeavor to contribute to the making of a more sustainable, beautiful, memorable, and popular city, reclaiming its moral and material completeness.



Léon Krier's iconic drawing illustrating the dialectics of public and private realms (Léon Krier)

Biographies | Biografias | Biografias

Lucien Steil

Lucien studied architecture in Paris, graduating in 1980. He is the principal of Katarxis Urban Workshops asbl., in Luxembourg and a partner at Heure Bleue Architects, London. He is currently Associate Teaching Professor at the University of Notre Dame. He has practiced in Luxembourg, producing a wide range of traditional designs in collaboration with Colum Mulhern. He has taught and lectured in Europe, the Americas, and Asia, and collaborated with the Prince of Wales's Urban Design Task Force in Potsdam and Berlin, the University of Miami, the Polytechnic University of Puerto Rico, the University of Bologna, and the Portuguese Catholic University in Viseu, and the University of Notre Dame (Rome Studies Program and US Campus, South Bend, Indiana, University of Buckingham, and University of Luxembourg). He is the author, editor, or co-editor of many publications, including *New Palladians*, *Traditional Architecture: Timeless Building for the Twenty-First Century*, *The Architectural Capriccio*, *In the Mood for Architecture* and *Travel Sketches from Elsewhere & Nowhere*.

Victoria Schulz-Daubas

Victoria is a PhD candidate and emerging architect whose work bridges philosophy, sustainability, and traditional design. She holds degrees in Architecture from the Technical University of Munich, Queen's University Belfast, and the University for the Creative Arts, UK, and has worked in practice with Apollodorus Architecture in London as well as at *DETAIL Magazine*. Her design approach centers on composition, rhythm, proportion, and the emotional resonance of space. At the King's Foundation, her doctoral research has explored the concept of the sublime in contemporary architecture, resulting in an illustrated *Sublime Design* handbook and interactive website. Alongside her academic work, she pursues design practice, speculative projects, and painting, seeking to connect historical insight with creative vision for contemporary architectural experience.

References | Referencias | Referências

Arendt, Hannah. 1958. *The Human Condition*. Chicago: University of Chicago Press

Heidegger, Martin. 1971. Building, Dwelling, Thinking. In *Poetry, Language, Thought*: 145–161. New York: Harper and Row.

Thomas D. Stroka

Indiana Limestone in Three Classical Buildings Today

La piedra caliza de Indiana en tres edificios clásicos actuales

O calcário de Indiana em três edifícios clássicos atuais

Abstract | Resumen | **Resumo**

This essay examines the contemporary use of Indiana limestone, a material employed in the United States for over two centuries for its durability and aesthetic qualities. Three recent Classical projects illustrate its versatility: the Chapel of the Holy Cross in Tampa (2018), featuring a Doric portico with monumental columns and carved reliefs; Christ Chapel in Michigan (2019), where massive limestone columns and entablatures support an unreinforced masonry dome; and Capstone Classical Academy in Fargo (2025), with an Ionic facade, inscriptions, and sculptural reliefs. In these applications, Indiana limestone serves as cladding, load-bearing masonry, or sculptural detail, demonstrating technical performance, dimensional stability, and an enduring capacity to embody Classical proportion and ornament in demanding climates.

Este ensayo analiza el uso contemporáneo de la piedra caliza de Indiana, un material empleado en Estados Unidos desde hace más de dos siglos por su durabilidad y sus cualidades estéticas. Tres proyectos clásicos recientes ilustran su versatilidad: la Capilla de la Santa Cruz en Tampa (2018), con un pórtico dórico de columnas monumentales y relieves tallados; la Capilla de Cristo en Michigan (2019), donde grandes columnas y entablamentos de piedra caliza dan soporte a una cúpula de fábrica no reforzada; y la Academia Clásica de Capstone en Fargo (2025), con una fachada de estilo jónico, inscripciones y relieves escultóricos. En estas obras la piedra caliza de Indiana se utiliza como revestimiento, fábrica portante o elemento escultórico, lo que permite demostrar su rendimiento técnico, su estabilidad dimensional y su capacidad para dar forma a la proporción y al ornamento clásicos incluso en climas exigentes.

Este ensaio examina o uso contemporâneo do calcário de Indiana, um material utilizado nos Estados Unidos há mais de dois séculos devido à sua durabilidade e qualidades estéticas. Três projetos clássicos recentes ilustram a sua versatilidade: a Capela da Santa Cruz em Tampa (2018), com um pórtico Dórico com colunas monumentais e relevos esculpidos; a Capela de Cristo em Michigan (2019), onde colunas e entablamentos maciços de calcário estruturam uma cúpula de alvenaria não reforçada; e a Capstone Classical Academy em Fargo (2025), com uma fachada Jônica, inscrições e relevos escultóricos. Em cada caso, o calcário de Indiana serve como revestimento, alvenaria de suporte de carga ou detalhe escultórico, demonstrando desempenho técnico, estabilidade dimensional e sua capacidade duradoura de incorporar proporções e ornamentação clássicas em condições climáticas exigentes.

Salem Limestone, commonly known as Indiana limestone (Siebenthal 1901), has been used in buildings for two centuries in the United States and continues to be an advantageous building material by virtue of its durability and beauty. This essay explores the application of Indiana limestone in three Classical buildings today, presented for their geographic variety, their recent construction, and their prominent use of cubic Indiana limestone. This stone has a consistency suitable for carving, withstands the elements, and can serve as cladding in large cubic pieces or else as a load-bearing material under axial compression in unreinforced masonry (Masonry Standards Joint Committee 2011).



1. Map of the continental USA showing Indiana quarries (Q) and the project locations: (1) Tampa, Florida, (2) Hillsdale, Michigan, (3) Fargo, North Dakota
2. Lawrence County Quarry (Cindy Cornett Seigle)



Bybee Limestone Company, Indiana



Buff, gray, and variegated Indiana limestone (polycor.com)

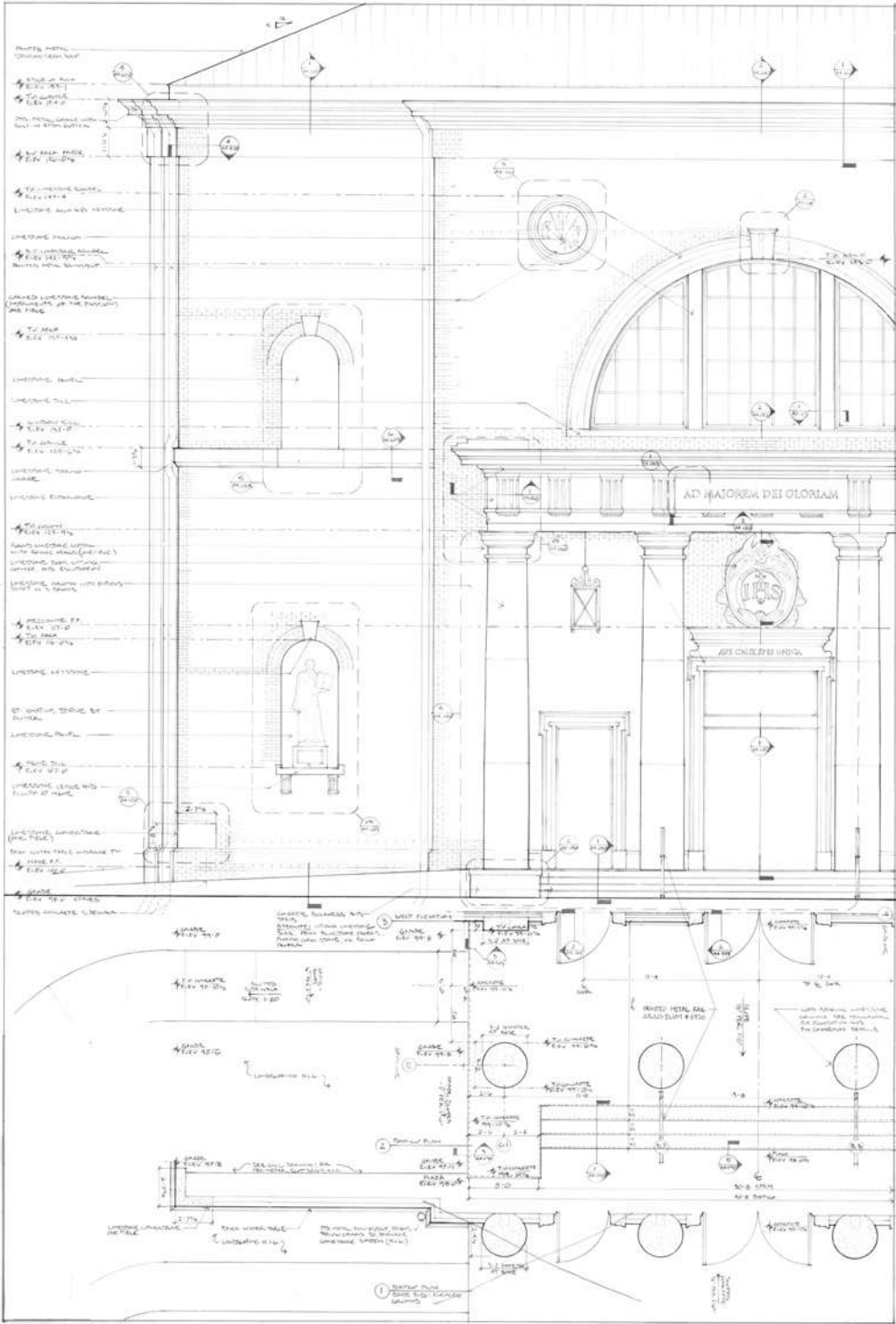


Fabricated limestone pieces at Bybee Limestone Company, Indiana



Chapel of the Holy Cross in Tampa, Florida

The Chapel of the Holy Cross in Tampa, Florida, was dedicated in 2018 and employs Indiana limestone in large cubic pieces. The chapel’s brick and limestone veneer reflects the color palette of the existing campus, and its significance is marked by a lantern and gold cross on the roof along with a tetrastyle portico on a symmetrical facade. The facade details are all carved in Indiana limestone. The stone specified by the architect was “variegated”, which allows the fabricator flexibility in sourcing the blocks.



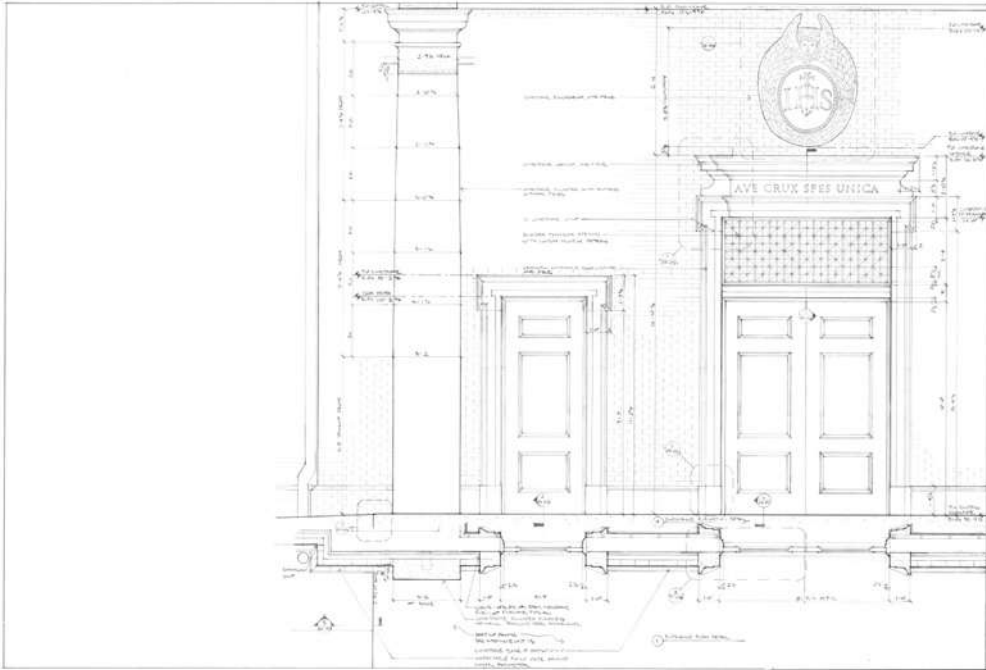
Facade details at the Chapel of the Holy Cross

The facade is articulated with a Doric portico of freestanding limestone columns, 732 cm in height and 91 cm in diameter, stacked in three drums. The Doric order was selected because the chapel is dedicated to the Cross of Christ, and moreover the Jesuit campus is educating young men. Vitruvius proposed that the Doric column exhibits male proportions, strength, and grace, and thus that this order’s simplicity of ornament is appropriate for certain temples (Schofield 2009).

Over the entrance is carved the motto AVE CRUX SPES UNICA, and above that is a large limestone coat of arms bearing the letters IHS, monogram of the Society of Jesus. While the inscription is



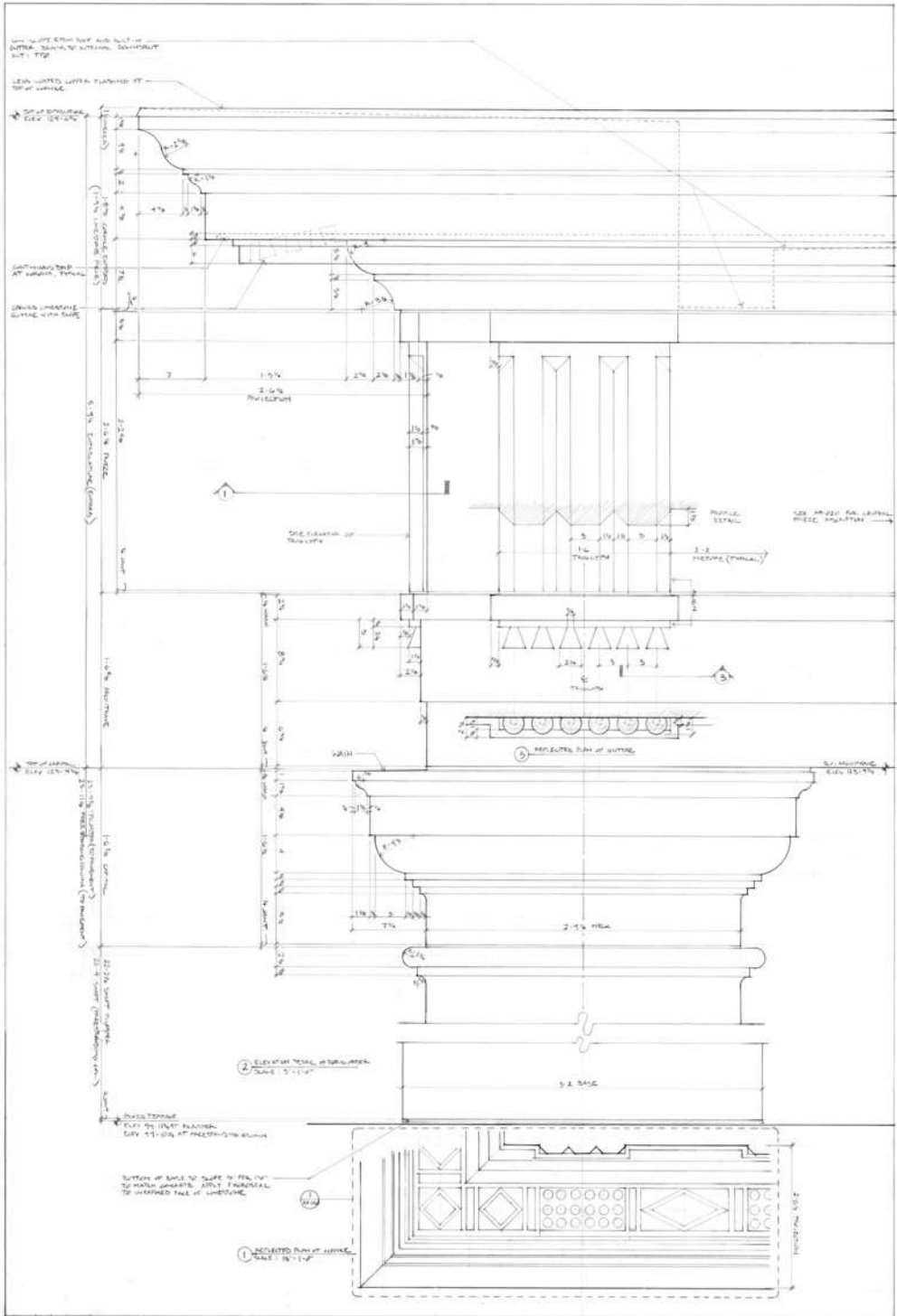
Chapel of the Holy Cross
(Timothy Hursley)



Drawing of a pilaster with entasis at
the Chapel of the Holy Cross

incised into the stone, the coat of arms is carved with raised relief and lettering, finished by hand and completed in a single piece over 180 cm tall.

The Doric columns and entablature are proportioned according to Andrea Palladio's guidelines in his Four Books of Architecture. The bottom column drum is two modules in diameter and bears on a concrete foundation. Each subsequent drum is pinned with stainless steel dowels. The entablature height is proportioned as one quarter that of the columns, so here it is 183 cm. We designed the cornice stones to sit extra deep and rest not only on the stone frieze but also on the steel beams trabeated between the columns.



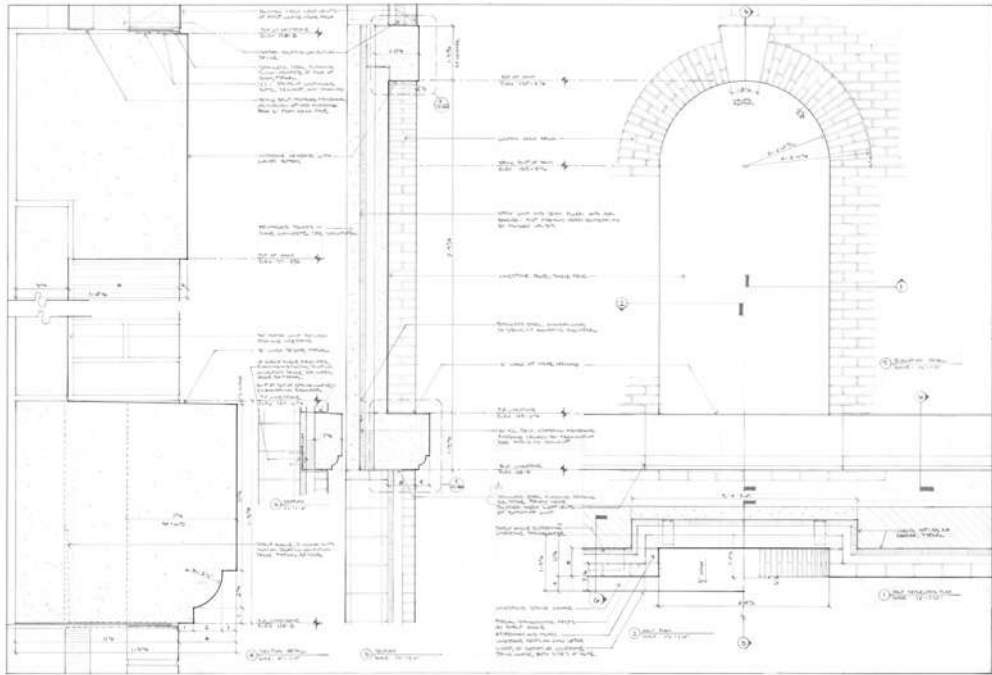
Portico entablature at the Chapel of
the Holy Cross

Normally the raw cubes of stone from the quarry measure 122 cm by 122 cm by 244 cm. When cutting limestone, some fabricators prefer fewer large pieces rather than many small ones, as there can be less waste from each block. Fewer but larger pieces can also simplify the overall preparation and installation. The cornerstone was crafted in Indiana limestone with incised lettering, V-cut with a recommended 2.5 cm minimum height.

We designed the limestone string course to wrap the chapel's tall brick volume and as a spring point for the arcuated windows, limestone archivols, and limestone facade niches. The string course is set in the brick coursework and allows for an uninterrupted wall cavity behind. It strengthens



1. Cornerstone laying at the Chapel of the Holy Cross
2. Coat of arms during initial rough-out carving by CNC



Drawing of the string course at the Chapel of the Holy Cross

the geometric ordering of each elevation by dividing the chapel walls into portions. The Tampa sunshine and rainfall have weathered the variegated limestone surfaces, gradually making them more homogenous. The initially strong gray striations on the columns have faded and the portico now appears more uniform. The chapel walls and columns have withstood four Florida hurricanes in the last several years, most recently Hurricane Milton.

Christ Chapel in Michigan

A second project is Christ Chapel in Michigan, dedicated in 2019. “Variegated” Indiana limestone was specified for the exterior and “rustic buff” for inside. The portico centerpiece is of freestanding limestone columns supporting a masonry dome spanning 9.75 m and each weighing some 11,800 kg. Above is a curved denticulated Doric limestone entablature. Each curved architrave and frieze piece bears on mortar joints at the top of the column and fits around a steel plate and tube supporting a tension ring, metal deck, and copper dome roof. The brick dome is unreinforced and works naturally in compression. The masonry contractor used centering formwork, removed slowly and uniformly once the limestone rosette “keystone” was in place and the 2.5 cm mortar parge topping had cured.

The main entrance is framed with a curved limestone surround and crowned by a concave curved pediment with hand-carved modillions. Indiana limestone is especially consistent in grain for detailed carving such as in the brackets supporting the cornice given its properties as a “free stone”, meaning it has uniformity of composition and texture without pronounced cleavage planes. The weather barrier and insulation run continuously behind the limestone at the structure’s surface.

At the side elevation, Doric pilasters are articulated in brick with limestone bases and capitals integrated with the masonry coursing. The pilasters are of multi-wythe brickwork. At the apex of the 9.75 m windows are limestone keystones supported by brick arches which transfer the veneer load to the remaining wall below.

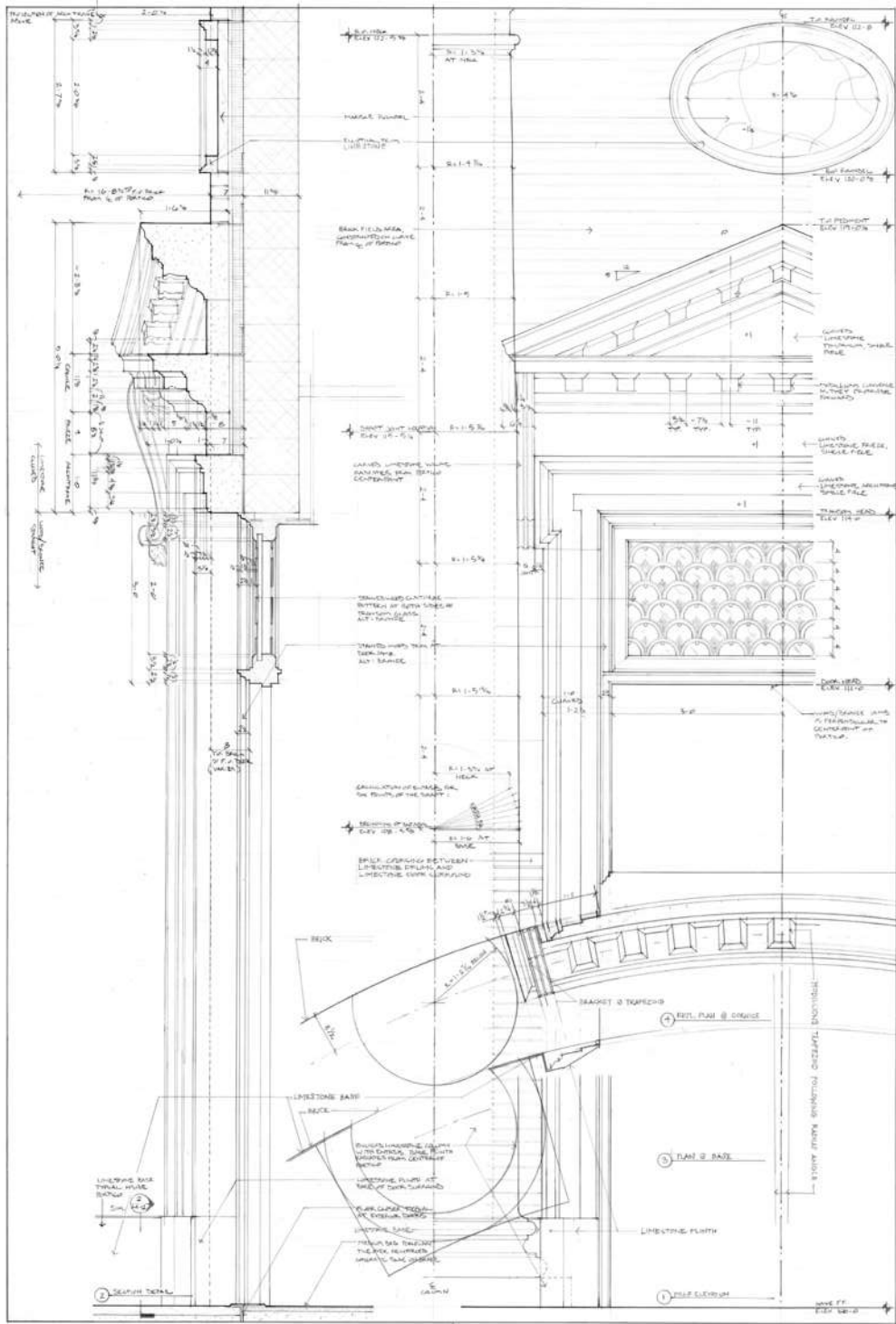


Facade at Christ Chapel (Francis Dzikowski/Otto)

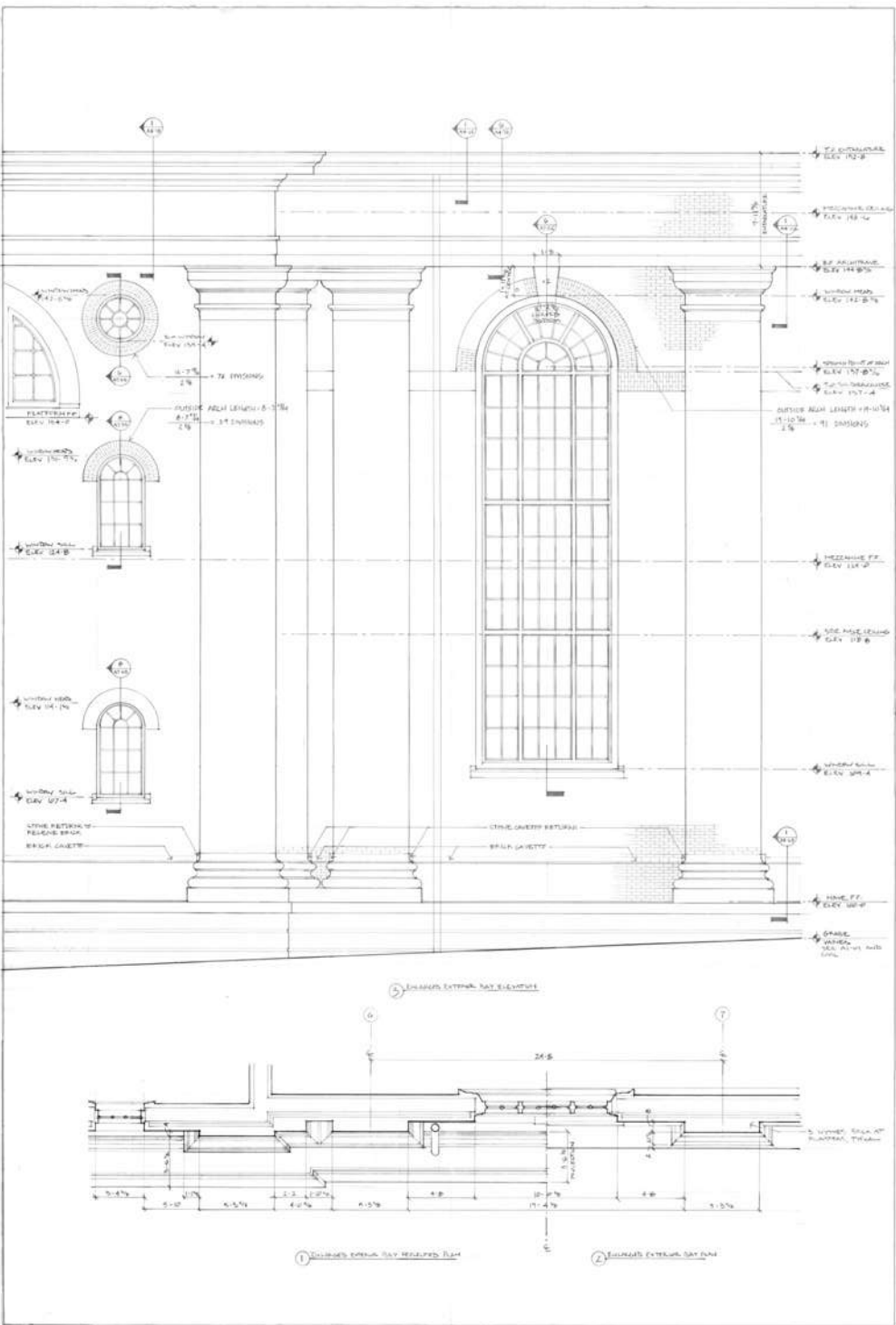


Side elevation at Christ Chapel (Francis Dzikowski/Otto)

Curved limestone entrance surrounds at Christ Chapel



Exterior limestone cladding can be of large cubic blocks or small veneer pieces. In a non-seismic zone the limestone pieces can be supported in compression by the masonry veneer below (Masonry Standards Joint Committee 2011), but they need to be anchored to a structural back-up wall for lateral support against wind loads and differential movement in clay-brick veneers. At Christ Chapel, the structural back-up is of concrete masonry units, which exhibit shrinkage through the initial seasons with exposure to carbon dioxide. Given the differential movement and volume changes in brick, limestone, and back-up walls, anchors should be placed under specialist guidance.



Side elevation bay at Christ Chapel

The nave's limestone columns are structural and support the live load of the side gallery seating as well as the chapel roof. Steel beams from the exterior wall rest in a side pocket in each stone column. On top of the limestone capital is a base plate for a steel column reaching to the beams of the roof. Limestone in compression behaves similarly to unreinforced concrete.

1. Erection of the portico dome shoring at Christ Chapel

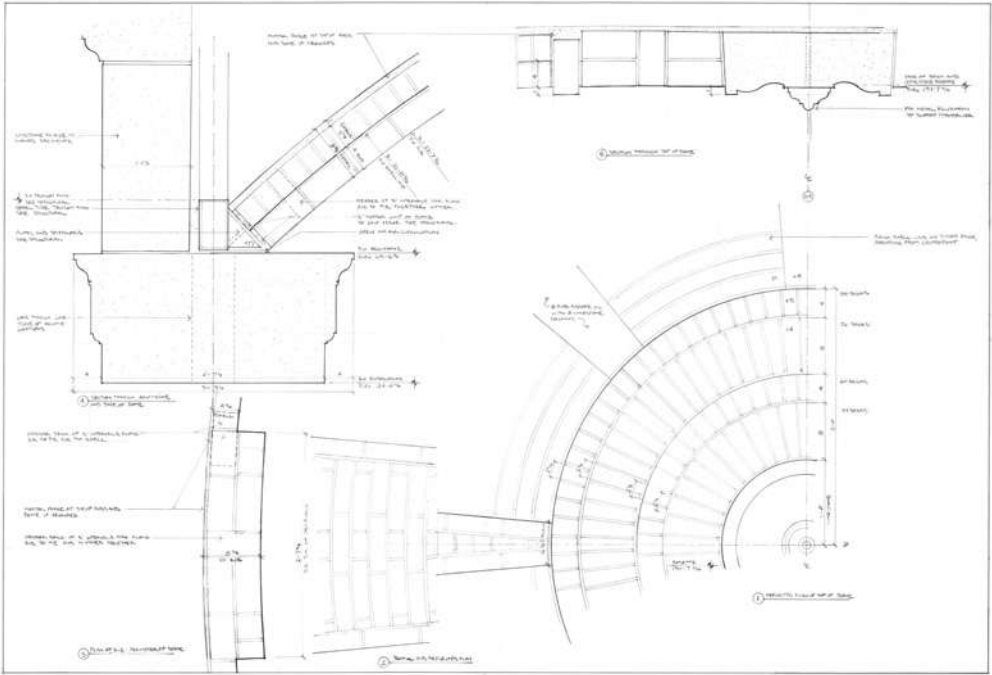
2. Carved limestone bracket in progress for the front entrance at Christ Chapel



Portico at Christ Chapel (Francis Dzikowski/Otto)



Portico dome at Christ Chapel (Francis Dzikowski/Otto)



Dome section details at Christ Chapel

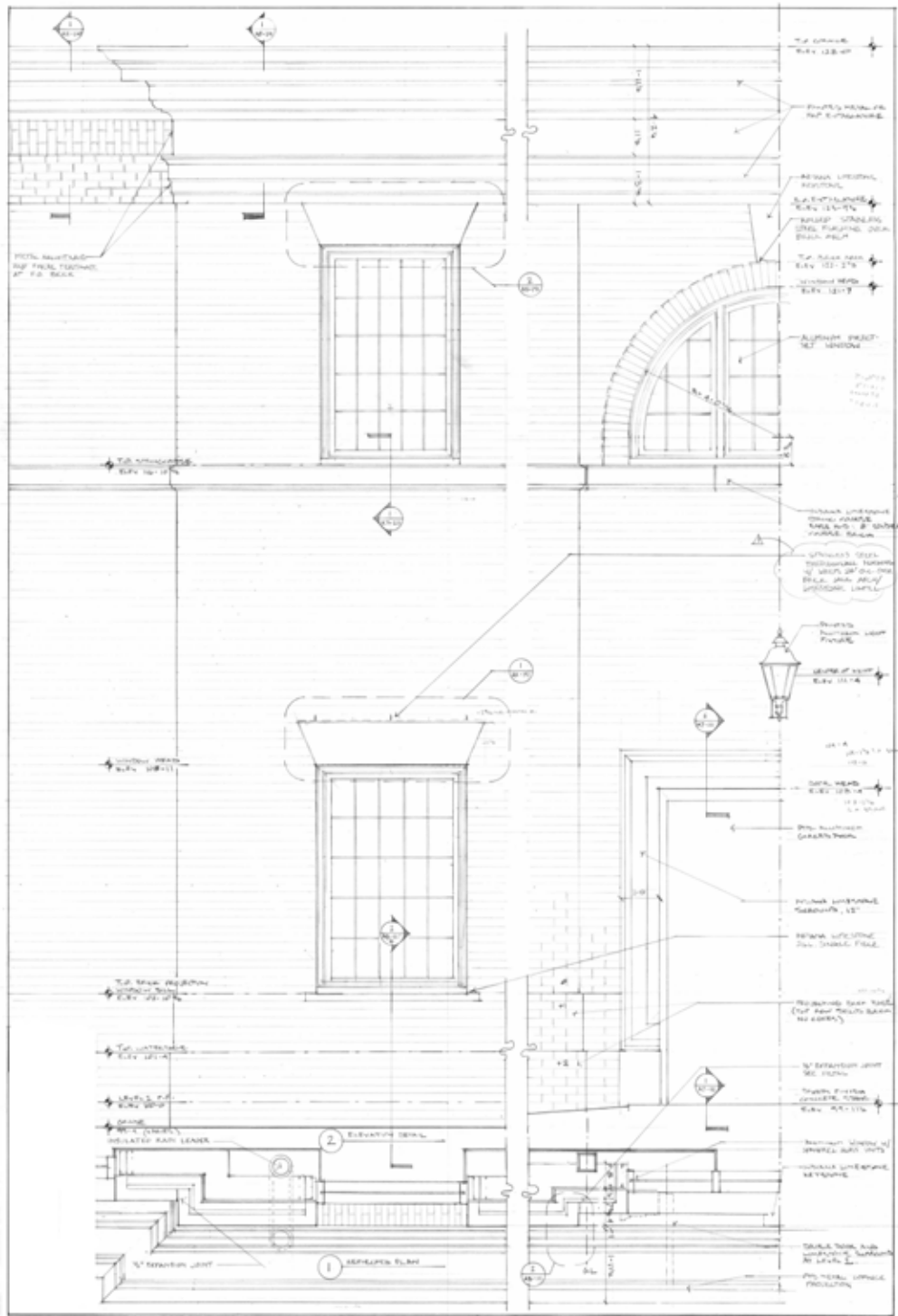
Capstone Classical Academy in Fargo, North Dakota

A third project is the Capstone Classical Academy in Fargo, North Dakota, completed in 2025. The limestone pieces are “variegated” and cut to a smooth finish. The facade columns are Ionic, nine diameters tall as recommended by Palladio. This order originated in Ionia with the construction of a temple to Diana inspired by woman’s slenderness, ornament, and proportion (Rowland and Howe 1999). The volutes of the capital are like locks of hair, and the column has an “attic” base profiled in limestone. The V-cut inscription in the entablature frieze is a verse from the Gospel of John. At either side of the inscription are hand-carved raised laurel crowns. Two figures in relief by the Scottish sculptor David Mitchell represent the philosophers Aristotle and Thomas Aquinas.

Window and door openings are spanned with brick arches and limestone lintels. The architect designed the lintels to be 18 cm thick for increased bearing capacity and modulus of rupture. Flexural tension stress from the lintel and veneer weight above runs parallel with the bed joints at either jamb side.



Capstone Classical Academy, completed in 2025 (Francis Dzikowski/Otto)



Fenestration drawing for Capstone Classical Academy

The stone door surrounds are proportioned to be no thinner than one sixth of the opening width, as recommended by Palladio. In Fargo the material proved its dimensional stability and durability through two winters of construction. Resilient to weathering and with high internal elasticity, Indiana limestone endures great variations in temperature.

These three recent projects illustrate how Indiana limestone can be used in Classical proportions and ornament, and in a way that withstands the elements, whether as cladding integrated into a masonry cavity wall or as load-bearing column drums. Indiana limestone has proven to be one of the most durable natural building materials over two hundred years of continuous use in America.



Capstone Classical Academy (Francis Dzikowski/Otto)

References | Referencias | Referências

Clifton-Taylor, Alec; and Ireson, Archibald Spencer. 1983. *English Stone Building*. London: Victor Gollancz Ltd.

Garrison, Elena M.S. (ed.). 2002. *The Graphic Standards Guide to Architectural Finishes*. Hoboken, NJ: John Wiley & Sons.

Indiana Limestone Institute. 2007. *Indiana Limestone Handbook*. Bedford: Indiana Limestone Institute.

Indiana Limestone Institute of America. 1984. *The Finishing Touch: A How-To and Idea Handbook on Indiana Limestone Standard Products*. Bedford: Indiana Limestone Institute of America.

Marble Institute of America. 2016. *Dimension Stone Design Manual*. Oberlin: Marble Institute of America.

Masonry Standards Joint Committee. 2011. *Building Code Requirements and Specification for Masonry Structures*. Boulder: The Masonry Society.

Odgers, David; and Henry, Alison (eds.). 2012. *Practical Building Conservation: Stone*. Farnham: English Heritage.

Rowland, Ingrid Drake; and Howe, Thomas Noble. 1999. *Vitruvius: Ten Books on Architecture*. Cambridge: Cambridge University Press.

Schofield, Richard (trans.). 2009. *Vitruvius on Architecture*. New York: Penguin Group Inc.

Sieenthal, Claude Ellsworth. 1901. On the Use of the Term Bedford Limestone. *The Journal of Geology*, 9, 3.

Tavernor, Robert; and Schofield, Richard (trans.). 1998. *The Four Books on Architecture by Andrea Palladio*. Cambridge: MIT Press.

Biography | Biografía | Biografia

Thomas D. Stroka

Thomas Stroka is a registered architect at the firm of Duncan G. Stroik Architect and has served as Adjunct Assistant Professor of Architecture at the University of Notre Dame. Thomas has been practicing for fifteen years, executing projects under the direction of the principal. Thomas likes to work on civic buildings and believes in the timelessness of Classical architecture and the durability of traditional materials such as Indiana limestone. The firm drafts construction drawings by hand and attempts an architecture that may seem worthy to future generations. Thomas lives in South Bend, Indiana with his wife and children.

Friedrich Bramsteidl

*An Active Water-Driven Hammer
Forge: Mazo de Mazonovo and
Wrought Ironwork in Asturias*

*Una fragua hidráulica en activo:
El Mazo de Mazonovo y la forja del
hierro en Asturias*

*Uma forja hidráulica em atividade:
O Mazo de Mazonovo e a forja do
ferro nas Astúrias*

Abstract | Resumen | **Resumo**

Mazo de Mazonovo, in Santa Eulalia de Oscos, is an eighteenth-century water-driven hammer mill still operating as a blacksmith’s forge, employing the same ironworking techniques used by local smiths over generations. The ensemble demonstrates the precision and efficacy of traditional water-powered systems applied to forge work and reflects the high technical accomplishment attained by Asturian *ferrería* ironworks. Its continuing use keeps the whole ensemble—dam, millrace, waterwheel, hammer, and forge—in working order, conserving the know-how required to operate such a forge and assuring the continuity of a technology which for centuries was essential to Asturian metallurgy.

El Mazo de Mazonovo, en Santa Eulalia de Oscos, es una fragua hidráulica del siglo XVIII que continúa activa como taller de forja. En este lugar aplico las mismas técnicas de trabajo del hierro que los herreros locales han empleado durante generaciones. El conjunto demuestra la precisión y la eficacia del sistema hidráulico tradicional aplicado a la forja y refleja el alto nivel de perfección técnica alcanzado por las *ferrerías* asturianas. Su actividad mantiene operativo un conjunto completo –presa, canal, rueda, mazo y fragua–, conserva el conocimiento técnico necesario para su funcionamiento y asegura la continuidad de una tecnología que durante siglos fue fundamental en el desarrollo metalúrgico de Asturias.

O Mazo de Mazonovo, em Santa Eulalia de Oscos, é uma forja hidráulica do século XVIII que continua ativa como oficina de forja. Neste local, aplico as mesmas técnicas de trabalho do ferro que os ferreiros locais têm utilizado ao longo de gerações. O conjunto demonstra a precisão e a eficácia do sistema hidráulico tradicional aplicado à forja e reflete o elevado nível de perfeição técnica alcançado pelas *ferrarias* asturianas. A sua atividade mantém operacional um conjunto completo –barragem, canal, roda d’água, maço e forja –, preserva o conhecimento técnico necessário ao seu funcionamento e assegura a continuidade de uma tecnologia que, durante séculos, foi fundamental no desenvolvimento metalúrgico das Astúrias.

Introducción

Nací en Austria en 1961, en el seno de una familia con una tradición de siete generaciones dedicadas a la forja. Allí me inicié en el oficio desde joven junto a mi padre y otros maestros herreros. Con el deseo de ampliar mi experiencia y convencido de que España conservaba un valioso patrimonio, decidí trasladarme primero a Andalucía y después a Galicia. Así, en 2001 fundé mi primer taller de forja artística en Bande (Orense), donde también impartí cursos de iniciación a la forja tradicional. Cinco años más tarde me establecí en Santa Eulalia de Oscos, en Asturias, para hacerme cargo del Conjunto Etnográfico del Mazo de Mazonovo, una fragua hidráulica del siglo XVIII que había sido restaurada y abierta al público.

Desde entonces me he ocupado del mantenimiento del mazo y de garantizar su correcto funcionamiento. En los primeros años tuve la oportunidad de formarme junto a algunos de los últimos herreros de mazo que aún trabajaban en la región, de quienes adquirí el conocimiento de los procedimientos tradicionales de este oficio. Tras más de dos décadas, el mazo sigue activo: se emplea tanto en demostraciones al público como en la producción de piezas de forja.



Friedrich Bramsteidl trabajando en la fragua del Conjunto Etnográfico del Mazo de Mazonovo (Guillermo Gil Fernández)



1: Fotografía histórica del Mazo de Ferreiravella en Riotorto (Lugo) en funcionamiento 2: El herrero Antonio Lombán Arango trabajando en el Mazo de Pezais, Santa Eulalia de Oscos (2: Archivo familiar de Lombán)



A lo largo de estos años mi equipo y yo hemos intervenido en diversos trabajos de restauración en el ámbito del patrimonio, entre ellos en el Palacio del Marqués de Santa Cruz en Castropol, el Palacio de Trénor en Figueras y el Palacio de las Torres de Donlebún en Barres. En varios de estos encargos se ha incorporado el mazo hidráulico en determinadas fases del trabajo, especialmente en la elaboración de herrajes, rejas y barandillas realizadas con métodos tradicionales.

La industria del hierro en Asturias

El hierro ha desempeñado en Asturias un papel decisivo desde la Edad Media. Los valles del occidente –Eo, Navia y Narcea– ofrecían las condiciones idóneas para el desarrollo de las ferrerías hidráulicas: mineral abundante, madera de castaño para la obtención de carbón vegetal y ríos con caudal constante y fuerte pendiente. En este contexto surgieron dos tipos de establecimientos: las *ferrerías* mayores, destinadas a la reducción del mineral, y los mazos, que se ocupaban del afinado y de la fabricación de herramientas y herrajes.

La incorporación de la energía hidráulica supuso una transformación absoluta de la industria del hierro. Las ruedas de paletas sustituyeron a la fuerza animal o humana, lo que proporcionaba una potencia regular y sostenida que permitía trabajar piezas de mayor tamaño de manera más eficiente. Durante los siglos XVII y XVIII la red de *ferrerías* del occidente asturiano alcanzó su máximo desarrollo. Cada *ferrería* se organizaba como un conjunto funcional, donde el taller, la presa, el canal, el *cubo*, la rueda y el mazo trabajaban de forma coordinada, como un solo mecanismo. Su construcción respondía a principios de equilibrio hidráulico y a una economía basada en el aprovechamiento de los materiales locales. El conjunto constituía una unidad productiva donde cada componente tenía una función precisa.

Cada valle disponía de varios mazos que atendían a una población rural autosuficiente. El hierro producido se destinaba principalmente a útiles agrícolas, clavos, herramientas de carpintería y herrajes de puertas o ventanas. El mazo no sólo era un centro de producción sino también de transmisión de conocimiento técnico y de intercambio entre oficios: carboneros, carpinteros, canteros y molineros compartían un mismo ecosistema.

El declive de las *ferrerías* tradicionales llegó en el siglo XIX con la aparición de los altos hornos, que transformaron la escala y la lógica de la producción. Sin embargo, en lugares apartados como los Oscos o Taramundi, donde la topografía impedía el desarrollo industrial, las *ferrerías* mantuvieron su actividad hasta mediados del siglo XX. Esa continuidad permitió conservar una tecnología de base hidráulica que hoy constituye una de las mejores muestras de ingeniería preindustrial.



El Mazo de Mazonovo antes de su restauración (Pablo Quintana Lopez)

Funcionamiento del Mazo de Mazonovo

El Mazo de Mazonovo se encuentra en la aldea del mismo nombre, en uno de los valles de Santa Eulalia de Oscos. Se trata de un conjunto formado por un mazo hidráulico y un taller de forja con origen en el siglo XVIII. Como otras ferrerías tradicionales del noroeste peninsular, su funcionamiento se basa en el aprovechamiento de la energía hidráulica para accionar un martillo de gran tamaño que permite transformar gruesos lingotes de hierro –los llamados *tochos*– en piezas más delgadas y manejables. Este sistema representó un avance decisivo en la industria del hierro, al reducir el esfuerzo físico del herrero y aumentar la productividad del taller.

Conjunto Etnográfico del Mazo de Mazonovo (Guillermo Gil Fernández)





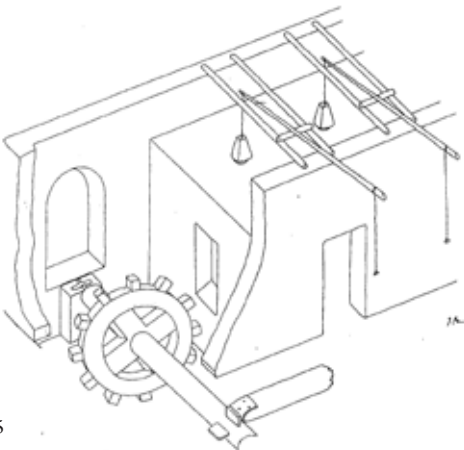
1



4



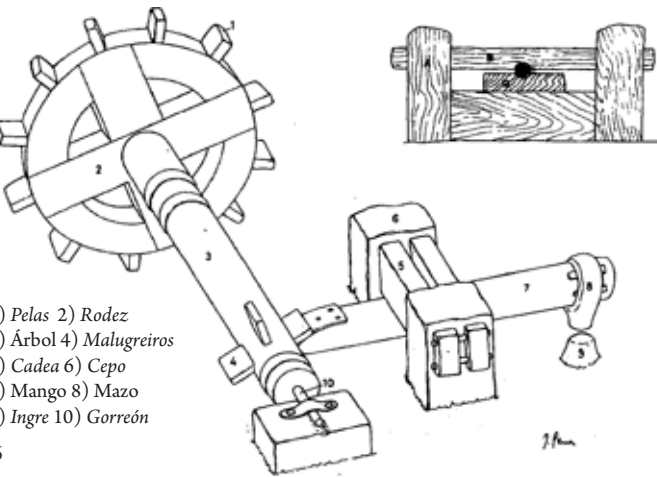
2



5



3



1) Pelas 2) Rodez
3) Árbol 4) Malugreiros
5) Cadea 6) Cepo
7) Mango 8) Mazo
9) Ingre 10) Gorreón
6

1: Acceso al Conjunto Etnográfico del Mazo de Mazonovo 2: El canal conduce el agua hasta el *cubo* o depósito 3: Vista superior del *cubo* con los dispositivos que propician el movimiento de la rueda hidráulica 4: Dibujo del sistema hidráulico del Mazo de Mazonovo 5: Esquema axonométrico del funcionamiento de una fragua hidráulica 6: Nomenclatura del mazo (1, 2, 3: Guillermo Gil Fernández 4: Gonzalo Morís Menéndez 5, 6: González Pérez 1994)

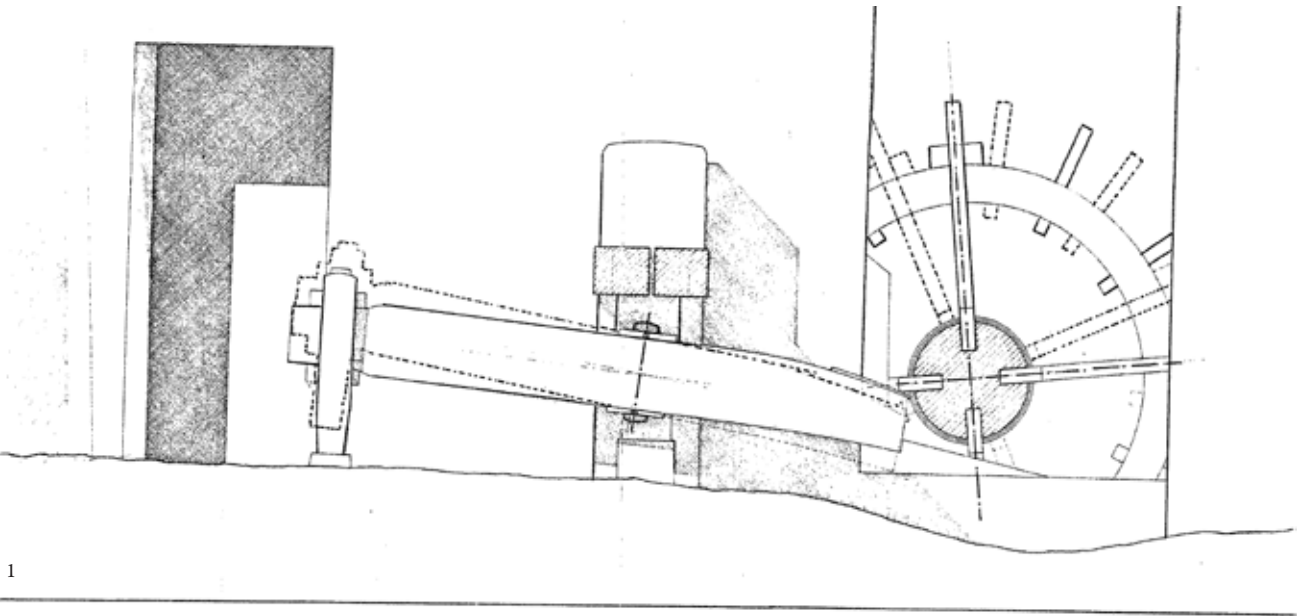
En Mazonovo el conjunto hidráulico aprovecha un salto de agua de unos cuatro metros en el río homónimo, afluente del Turia. La presa, construida con lajas de pizarra en el punto donde la corriente es más lenta, desvía el agua hacia un canal o acequia de unos 350 metros de longitud, excavado directamente en el terreno y delimitado por muretes de piedra seca. El canal conduce el agua hasta el *cubo* o depósito, desde donde se descarga sobre la rueda hidráulica –llamada *rodez*– fabricada en madera de roble. Esta rueda, con un diámetro de aproximadamente 2,30 metros y una anchura de 0,60, transforma la energía del agua en movimiento de rotación. El eje horizontal, también de madera y de unos cinco metros de longitud, transmite el movimiento a un árbol de levas provisto de varias

excéntricas que elevan y liberan el brazo del martillo. Este martillo, de 114 kilogramos, está formado por una cabeza de acero encajada en un mango de madera de 2,90 metros. El golpe se concentra sobre un yunque macizo.

El caudal de agua se regula mediante una compuerta que permite ajustar la potencia del golpe en función del trabajo a realizar. La apertura de la compuerta es regulable desde el propio lugar de trabajo, mientras se forja el material. La respuesta del sistema es inmediata: una mínima variación en la apertura de la compuerta altera la frecuencia del martillo, lo que exige una atención constante por parte del operador.

Además del martillo, el taller conserva un segundo ingenio hidráulico: la trompa o tromba de aire, que sustituye al fuelle tradicional. Se trata de un dispositivo que inyecta aire en la fragua gracias al efecto Venturi. El flujo de agua, al pasar por un estrechamiento del conducto, crea una depresión que aspira el aire exterior, impulsándolo hacia el hogar. Este sistema permite mantener una combustión

1: Sección explicativa del funcionamiento del mazo 2: Rueda hidráulica o rodez en movimiento 3: Interior de la fragua (1: González Pérez 1994 2, 3: Guillermo Gil Fernández)



1



2



3



Friedrich Bramsteidl encendiendo la fragua (Guillermo Gil Fernández)

continua sin intervención manual y refleja la sofisticación técnica alcanzada por las *ferrerías* hidráulicas asturianas en los siglos XVIII y XIX.

El combustible utilizado es carbón vegetal de castaño, que alcanza temperaturas próximas a los 1.200 °C. La temperatura del hierro se evalúa visualmente: el herrero experimentado distingue los distintos tonos que van del rojo oscuro al blanco brillante, cada uno asociado a una fase del trabajo. El oído complementa la vista, pues el sonido del golpe varía según la densidad y la temperatura del metal. Este conocimiento empírico constituye la base del control técnico en la forja tradicional.

El edificio del mazo se levanta con muros de pizarra y estructura de madera de castaño. El suelo, ligeramente inclinado hacia el canal de desagüe, facilita la evacuación del agua utilizada en el temple. La cubierta, formada por lajas de pizarra, asegura la ventilación y protege de la humedad. Todo el conjunto se organiza en torno a un eje que une la presa, la rueda, la fragua y el taller, de modo que el herrero puede realizar todas las operaciones sin desplazamientos innecesarios.

1: Herramientas del herrero 2: Friedrich Bramsteidl trabajando el metal sobre el yunque (1, 2: Guillermo Gil Fernández)



1



2

El equilibrio hidráulico es fundamental para el funcionamiento del mazo. Un caudal excesivo puede desestabilizar la rueda, mientras que una presión insuficiente interrumpe la rotación. Esta regulación estacional forma parte del saber técnico del oficio y demuestra la integración del taller en el ciclo natural del entorno.

La forja hidráulica

El trabajo en el mazo sigue una secuencia precisa. Primero se calienta el hierro en la fragua hasta alcanzar la temperatura adecuada para su deformación. A continuación se coloca la pieza sobre el yunque y se acciona el mazo.

Las operaciones fundamentales de la forja tradicional se basan en cuatro técnicas que todo herrero debe dominar con precisión: estirar, afilar, espalmar y recalcar. Estirar consiste en alargar y adelgazar el hierro mediante golpes sucesivos en una dirección determinada, lo que incrementa su longitud



1, 2: Tirador y barandilla de forja en el Palacio de los Trénor en Figueras, Asturias (1, 2: Guillermo Gil Fernández)

y reduce su sección; afilar implica reducir el grosor del metal en un punto concreto para formar un borde o una punta precisa; espalmar busca aplanar y ensanchar el material mediante golpes sobre la superficie que permiten extenderla lateralmente y obtener formas más delgadas y anchas; y recalcar, por el contrario, tiene como objetivo aumentar el diámetro o la sección de una pieza reduciendo su longitud, concentrando el material para formar cabezas o refuerzos. Cada una de estas operaciones exige un control riguroso del ritmo de golpeo

En Mazonovo se fabrican tanto piezas utilitarias –herramientas, clavos, bisagras– como elementos estructurales y decorativos. El sistema hidráulico confiere al trabajo una regularidad mecánica que permite obtener resultados más homogéneos, pero no elimina el componente artesanal. Cada pieza producida presenta pequeñas variaciones derivadas de la respuesta del material y del golpe.



Friedrich Bramsteidl trabajando el metal sobre el yunque (Guillermo Gil Fernández)

Legado

El Mazo de Mazonovo no es un museo o una reliquia, sino una instalación en funcionamiento constante. Gran parte de su valor patrimonial reside precisamente en esa condición de conservación activa, que mantiene vivos y operativos tanto los mecanismos de la fragua como el conocimiento necesario para operarlos.

El mazo permite comprender la lógica constructiva de las *ferrerías* tradicionales: la relación entre el salto de agua y el diámetro de la rueda, entre el peso del martillo y la sección del eje, o la sincronía entre la tromba de aire y el golpeo. Todos estos parámetros han sido ajustados empíricamente y han sido perfeccionados con el paso de los siglos.

La actividad del mazo asegura su conservación. El uso continuo previene el deterioro de los mecanismos, mientras que la inactividad favorece la aparición de óxido, humedad y otros daños que comprometen su rendimiento.

El Mazo de Mazonovo demuestra la plena vigencia técnica y funcional de los sistemas hidráulicos tradicionales aplicados a la forja. Su mantenimiento operativo permite conservar no solo un mecanismo histórico, sino también un modo de trabajo basado en la precisión manual, el aprovechamiento racional de la energía y la adaptación a las condiciones naturales del entorno. Su uso asegura la transmisión de conocimientos empíricos esenciales para comprender la tecnología del hierro anterior a la mecanización moderna. Mantenerlo activo permite conservar un testimonio único de la ingeniería preindustrial y de la cultura técnica que sustentó durante siglos el oficio del herrero.

References | Referencias | Referências

García Hermida, Alejandro (coord.). 2024. *Nueva Arquitectura Tradicional MMXXIV*. Madrid: Fundación Culturas Constructivas Tradicionales.

González Pérez, Clodio. 1994. *A producción tradicional do ferro en Galicia. As grandes ferrerías da provincia de Lugo*. Lugo: Diputación Provincial de Lugo.

Morís Menéndez-Valdés, Gonzalo. 1995. Ingenios hidráulicos históricos. Molinos, batanes y ferrerías. *Ingeniería del agua*, 2, 4: 25-42.

Biography | Biografía | Biografia

Friedrich Bramsteidl

Friedrich Bramsteidl es maestro herrero y responsable del Conjunto Etnográfico del Mazo de Mazonovo, en Santa Eulalia de Oscos (Asturias). Procedente de una familia con siete generaciones dedicadas a la forja, se formó desde joven en el taller familiar y más tarde amplió su experiencia en diversos talleres europeos antes de establecerse en España. En 2001 creó su primer taller de forja artística en Bande (Ourense) y, desde 2006, está a cargo del Mazo de Mazonovo, donde desarrolla a la vez la labor de conservación del conjunto hidráulico y la producción de piezas de forja tradicional. Ha realizado trabajos en destacados edificios patrimoniales como el Palacio del Marqués de Santa Cruz en Castropol, el Palacio de Trénor en Figueras y el Palacio de las Torres de Donlebún en Barres. En 2024 recibió el Premio de las Artes de la Construcción de la Fundación Culturas Constructivas Tradicionales en la categoría de trabajos del metal y del vidrio.



Research
Papers
Artículos
científicos
Artigos
científicos

302 *Proportion as the Timeless Essence of Mughal Architecture*
La proporción como esencia atemporal de la arquitectura mogol
A proporção como essência atemporal da arquitetura mogol
Taimoor K. Mumtaz

319 *“Ear-Roofed” Houses in Mixteca Baja, Puebla State: The Ñuu’Davi Traditional Building System*
La casa de “techo de oreja” en la Mixteca Baja de Puebla: Sistema constructivo tradicional Ñuu’Davi

A casa de “telhado de orelha” na Mixteca Baja de Puebla: Sistema construtivo tradicional Ñuu’Davi
Óscar Rafael Cruz Vázquez, Luis Fernando Guerrero Baca

336 *Tegizamin: The Invisible Engineering of Ichan-kala, Khiva*
Tegizamin: La ingeniería invisible de Ichan-kala, Jiva
Tegizamin: A engenharia invisível de Ichan-kala, Khiva
Bonu Azizova

347 *Dovecotes in the Principality of Asturias: A Neglected Heritage*
Los palomares en el Principado de Asturias: Un patrimonio olvidado
Os pombais do Principado das Astúrias: Um património esquecido
María Prieto Vergara

366 *Exploring the Beauty of Tradition: How Fractal Geometry Influences Visual Attention in Architectural Design*
La belleza de la tradición: Cómo influye la geometría fractal a la atención visual en el diseño arquitectónico

A beleza da tradição: Como a geometria fractal influencia a atenção visual no design arquitetónico
Brandon R. Ro, Xavier Parareda

385 *Building Village Life in Kamhua Noknu, Arunachal Pradesh*
Construyendo la vida comunitaria en Kamhua Noknu, Arunachal Pradesh
Construindo a vida na aldeia de Kamhua Noknu, Arunachal Pradesh
Tara Douglas

Taimoor K. Mumtaz

Proportion as the Timeless Essence of Mughal Architecture

La proporci3n como esencia atemporal de la arquitectura mogol

A propor33o como ess4ncia atemporal da arquitetura mogol

Keywords | Palabras clave | Palavras chave

Mughal design methods, Tomb of Akbarabadi Mahal, Tomb of Fatehpuri Begum, Taj Mahal, Badshahi Mosque

M4todos de dise1o mogoles, Tumba de Akbarabadi Mahal, Tumba de Fatehpuri Begum, Taj Mahal, Mezquita Badshahi

M4todos de design mog3is, Tumba de Akbarabadi Mahal, Tumba de Fatehpuri Begum, Taj Mahal, Mesquita Badshahi

Abstract | Resumen | Resumo

This paper presents a geometric analysis of four seventeenth-century Mughal buildings in an attempt to decipher the design methods used by Mughal architects to create their masterpieces. The geometric analysis is placed in the framework of the *Hasht Bihisht* (Eight Paradises) plan-form, the archetypal ground-plan of Mughal architecture. Categorized as a type of “nine-square mandala” diagram, the *Hasht Bihisht* is a symbol of the cosmos, i.e., a harmoniously created universe. Our findings are a continuation of those of scholars of Central Asian Timurid architecture and analogous to what is common to traditional architecture generally, down to our times, as will be shown through the work of a hereditary master mason. In conclusion, it is proposed that these design methods be interpreted in the light of traditional cosmology.

Este art4culo presenta un an4lisis geom4trico de cuatro edificios mogoles del siglo XVII con el objetivo de descifrar los m4todos de dise1o empleados por los arquitectos mogoles para crear sus obras maestras. El an4lisis geom4trico se sit4a en el marco del esquema *Hasht Bihisht* (“Ocho Para4isos”), la planta arquet4pica de la arquitectura mogol. Clasificado como un tipo de diagrama de “mandala de nueve cuadrados”, el *Hasht Bihisht* simboliza el cosmos, es decir, un universo creado en armon4a. Nuestros hallazgos dan continuidad a las investigaciones sobre la arquitectura tim4rida de Asia Central y se corresponden con los principios comunes a la arquitectura tradicional en general, vigentes hasta nuestros d4as, como se mostrar4 a trav4s del trabajo de un maestro alba1il heredero de esta tradici3n. En conclusi3n, se propone interpretar estos m4todos de dise1o a la luz de la cosmolog4a tradicional.

Este artigo apresenta uma an4lise geom4trica de quatro edif4cios mog3is do s4culo XVII, com o objetivo de decifrar os m4todos de concep33o utilizados pelos arquitetos mog3is na cria33o de suas obras-primas. A an4lise geom4trica 4 enquadrada no esquema *Hasht Bihisht* (“Oito Para4isos”), a planta arquet4pica da arquitetura mogol. Classificado como um tipo de diagrama de “mandala de nove quadrados”, o *Hasht Bihisht* simboliza o cosmos, ou seja, um universo criado em harmonia. Nossas conclus3es d4o continuidade 4s pesquisas sobre a arquitetura tim4rida da 4sia Central e s4o an4logas aos princ4pios comuns da arquitetura tradicional em geral, vigentes at4 os nossos dias, como ser4 demonstrado atrav4s do trabalho de um mestre pedreiro heredit4rio. Em conclus3o, prop3e-se que esses m4todos de concep33o sejam interpretados 4 luz da cosmologia tradicional.

Introduction

“When one sees eternity in things that pass away, then one has pure knowledge”

Bhagvad Gita

“The good, of course, is always beautiful, and the beautiful never lacks proportion”

Plato

“The transcendent world is the world of loveliness and beauty, and the source of loveliness and beauty is harmony/proportion (tanasub)...”

Imam Ghaz4li

Proportion has been seen as the essence of beauty across cultures, as evidenced in the above quotations, while beauty itself is seen as an aspect of the “divine” and hence as a reflection of the “timeless.”

“Its boundaries [lit. sides] are Eternity without beginning or end,

While its stairs are Time’s total aggregate of years.

Since its lustrous stone is entirely free from blemish, The edifice appears as unified as one perfect bubble.”

Description of the Taj Mahal by court poet Kalim in the *Padshah Namah* (Begley, Wayne, and Desai 1984)

This study has been undertaken by a practicing architect attempting to develop ways of employing these methods in contemporary practice, based on a knowledge of their traditional use and their artistic function—to create an architecture which reflects something of the timeless quality of art.



Figure 1: Babur supervising the laying out of the Garden of Fidelity, painting ca. 1590 (Victoria and Albert Museum)

The Mughals & Mughal Architecture

Founded in 1526 by Babur (1483-1530), the Mughals were a dynasty of Timurid¹ descent whose presence in India lasted from 1526 to 1857. It was Akbar who in the second half of the sixteenth century (1556-1605) laid the administrative and cultural foundations which defined the subsequent Mughal rule in India. Shah Jahan's reign in 1628-1658 saw the Mughal empire reach its heyday. Its largest expansion came under Aurangzeb (1658-1707), the last of the great Mughal emperors, after whose death the dynasty declined until 1757, when it disintegrated into princely states only nominally subservient to the king in Delhi. The last of these kings, Bahadur Shah Zafar, was deposed by the British in 1857.



Figure 2: Three Timurid madrasahs, Registan Square, Samarkand, Uzbekistan, Ulugh Beg Madrasah (1417–1420), Sher-Dor Madrasah (1619–1636), and Tilya-Kori Madrasah (1646–1660) (Geoff Henson)



Figure 3: I'timād-ud-Daulah, Agra (Muhammad Mahdi Karim)

The Mughal court attracted scholars, painters, architects, poets, calligraphers, and statesmen from all over Iran, Central Asia, Transoxiana, and the Subcontinent. The royal family and court not only patronized this galaxy of artists and intellectuals but took a personal interest in many arts and sciences.

It is thus no wonder that in this rich artistic and intellectual environment coupled with enormous wealth, Mughal architecture created a supremely confident style synthesizing Transoxianian, Timurid, Indian, Persian, and even some European elements (Koch, Ebba 1991: 13).

The defining influence on their architecture, though, was Timurid. To quote the Austrian scholar Professor Ebba Koch (1991: 13):

Since the Mughals were direct heirs to the Timurids, the sustaining element of their architecture, especially during the initial phase, was Timurid (in the older literature often considered to be “Persian”). [...] A fact that is not generally recognised is that essential ideas of Timurid architecture, such as the perfect symmetry of plan reflected consistently in the elevations, as well as complex vault patterns, came to fruition much more in Mughal architecture than in Safavid Iran, which was also heir to the same tradition.

Framework: *Hasht Bihisht* (Eight Paradises) Plan-form, Principles and Design Methods

According to Koch, the archetypal Mughal ground-plan is the *Hasht Bihisht* plan-form of Persianate Islamic architecture (Koch 1991: 45). Found in other traditions, it is sometimes named the “nine-square mandala” or “cosmogram”—the *Vastu-Purusha* mandala of Indian temple architecture or the *Ming-Tang* square of traditional Chinese design. Through these various names in different traditions and the related mythologies, this ground-plan is simultaneously seen as a symbol of paradise and of the cosmos in its qualitative aspect. As the cosmos is regarded as a reflection of a Divine Principle, this architecture ultimately reflects the qualities of that Principle with its cosmic symbolism, through a conception common to all premodern and sacred traditions, in which the cosmos is a manifestation of the Creator.

“I was a Hidden Treasure and wished to be known, so I created the creation that I might be known.”

Hadith Qudsi—God’s words as reported by the Prophet of Islam

“Crazy Horse dreamed and went into the world where there is nothing but the spirits of all things. That is the real

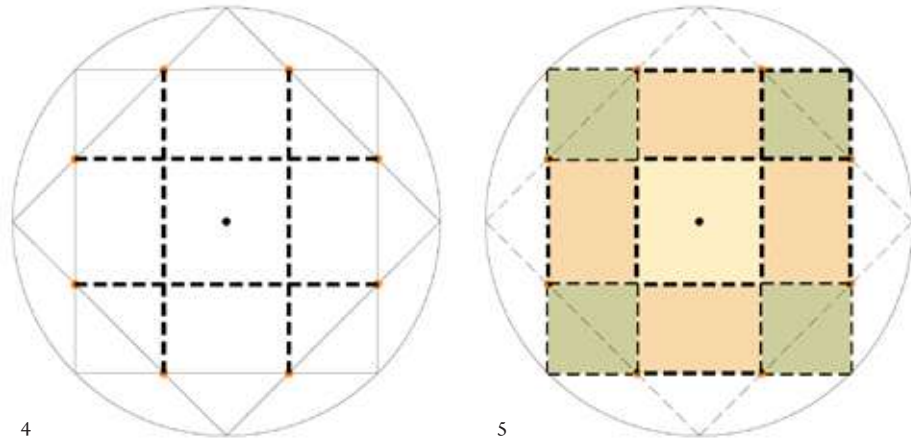


Figure 4: *Hasht Bihisht* – Geometry

Figure 5: *Hasht Bihisht* – Spatial configuration

world that is behind this one, and everything we see here is something like a shadow from that world.”

Black Elk Speaks (Neihardt 1972)

“It all seems ‘real’, but as it is constantly changing, it is not Real. Due to this *Maya* mentality (the illusion that the world is Real), people do not look beyond the veil of illusion to Me, the unchanging consciousness, the Absolute Reality ... the very basis of it all.”

Bhagavad-Gita

The archetypal form of this plan is a central square surrounded on the four major axes by four rectangles and at the corners by smaller squares. Geometrically, this is derived from the intersection points of two squares at 45 degrees to each other, which give the vertices of a regular octagon (Figs. 4 and 5). The typical divisions of elevation and section are also projections of this division from the ground (Fig. 6). This archetypal arrangement is employed at all scales from facades as a whole to facade elements and its consistent application generates a sense of unity and wholeness typical of traditional architecture.

The *Hasht Bihisht* plan is especially prominent in Mughal architecture, which adopted and developed this model (Koch 1991: 27). It is within the *Hasht Bihisht* “spatial framework” that “elements” such as arches, domes, *jharokas* (bay windows), and geometric patterns are placed. Also constitutive of Mughal architecture are aesthetic “principles of design”: balance, symmetry, harmony, emphasis on a central element (achieved through odd-numbered divisions of elevations and within elements). All these principles again reflect the conception of beauty outlined above and in our opening quotations. Finally are the practical “methods” or tools of design—including geometric proportioning—used to give physical form to these principles².

Geometric Analyses

Geometric analyses of two small and relatively simple Mughal buildings are presented below to highlight the basic design approach and methods used. The first is of the Eastern Subsidiary Tomb of Akbarabadi Mahal (d. 1677) or “Saheli Burj”, in the Taj complex (Fig. 7).

Typical Building Typology:

The ‘Nine Square’
Hasht Bihisht
Plan-type

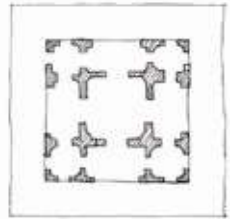
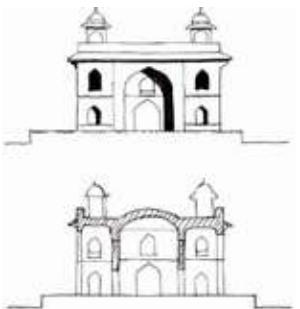


Figure 6: *Hasht Bihisht* in Mughal architecture – Schematic example of a typical Mughal pavilion

Main features:

- Double storied corners
- Double-height Iwans on Cardinal Axes



- Double-height central space

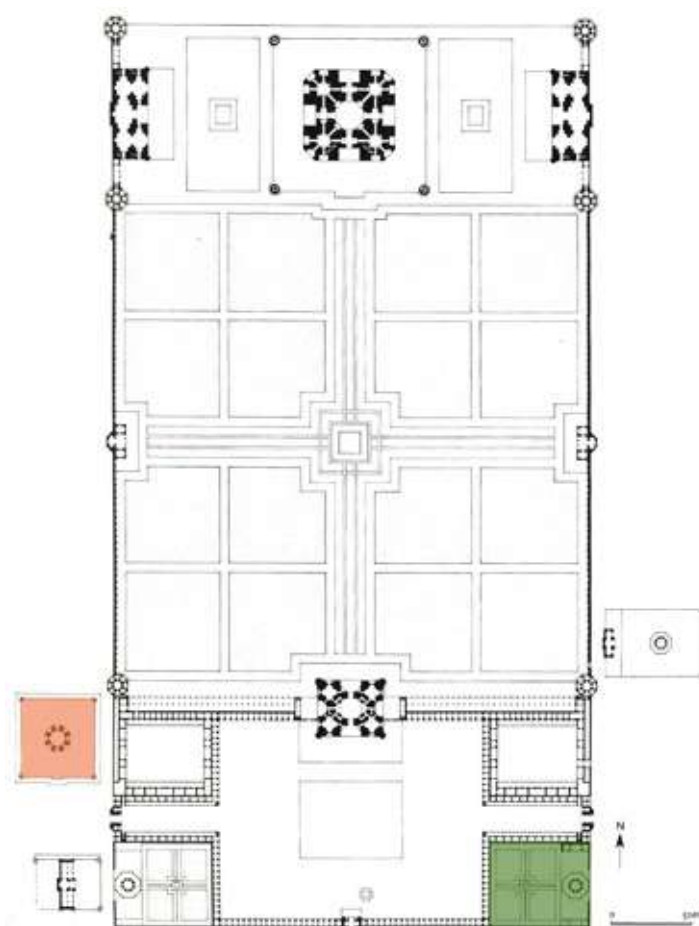


Figure 7: Taj Mahal complex with Saheli Burj highlighted in green and the tomb of Fatehpuri Begum in orange (Koch 2006: 114)

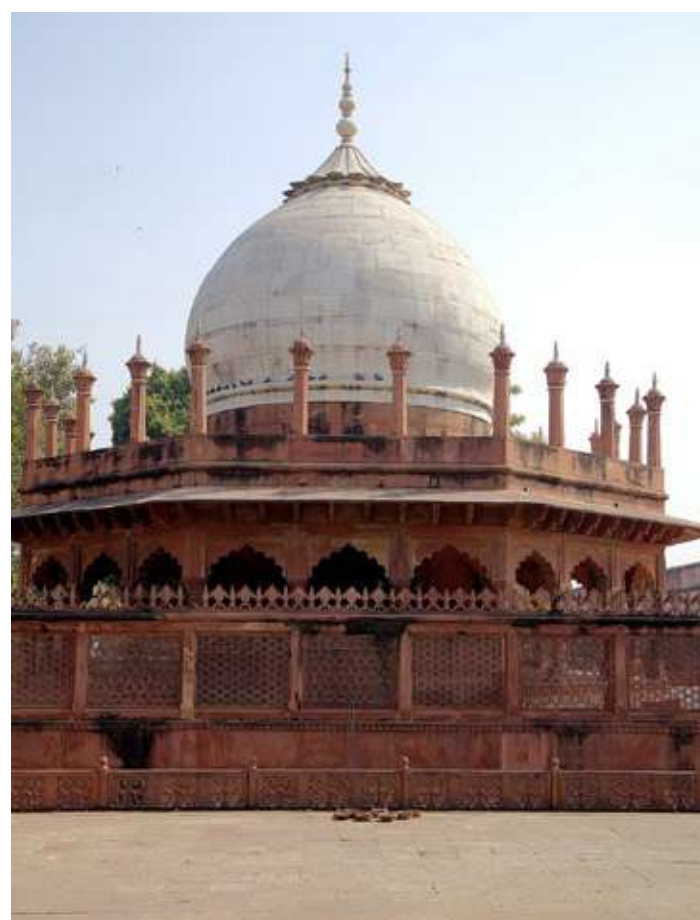


Figure 8: Eastern Subsidiary Tomb of Akbarabadi Mahal (Saheli Burj) (American Institute of Indian Studies)

According to Koch, “the two enclosures that flank the *Jilaukhana* (forecourt) on the south are funerary complexes held to be those of lesser wives of Shah Jahan” (Koch 2006: 120). The Eastern Subsidiary Tomb could well be that of Akbarabadi Mahal Begum, who died in 1677 (Koch 2006: 121).

Saheli Burj: Geometric Analysis

Analysis of the Plan on a Drawing by Ebba Koch (2006: 121)

Step 01. A series of diminishing inscribed rotating squares gives us a series of regular octagons from the veranda perimeter to the tomb chamber perimeter (Fig. 9).

Step 02. Adding the next two inscribed rotating squares gives us the tomb chamber's inner perimeter as well as the wall thickness (Fig. 10).

Step 03. Continuing the series of inscribed rotating squares inward gives us the grave length as 2.66 gaz^3 , and the intersections of the last two rotating squares gives the grave

width as 1 gaz . The length of the grave platform, 3.66 gaz , is given by the diagonal of the last rotated (red) square (Fig. 11).

Step 04. Extending the lines of these last rotating squares outward marks out the width of the recessed arched panels (*pseudo-pishtaq*s, in Koch's view) on the tomb chamber's outer elevation (Fig. 12).

Step 05. Extending the lines of the second-last series of rotating squares outward marks out the width of the tomb chamber entrances (Fig. 13).

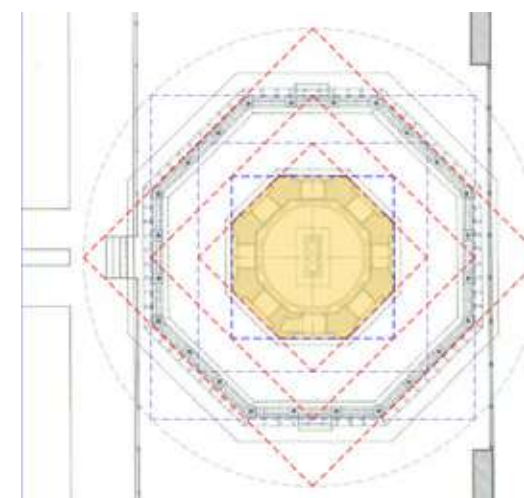


Figure 9: Geometric analysis of Saheli Burj – Plan – Step 01

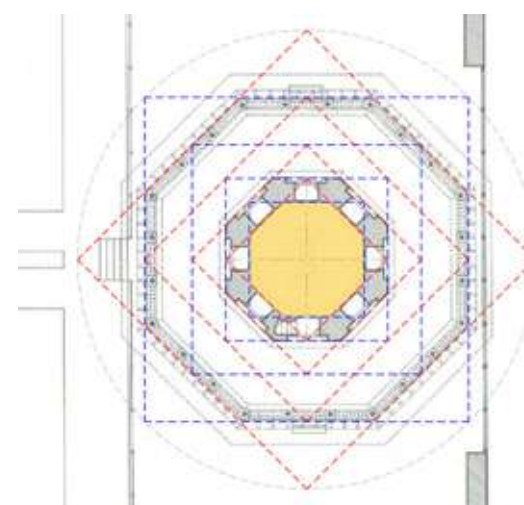


Figure 10: Geometric analysis of Saheli Burj – Plan – Step 02

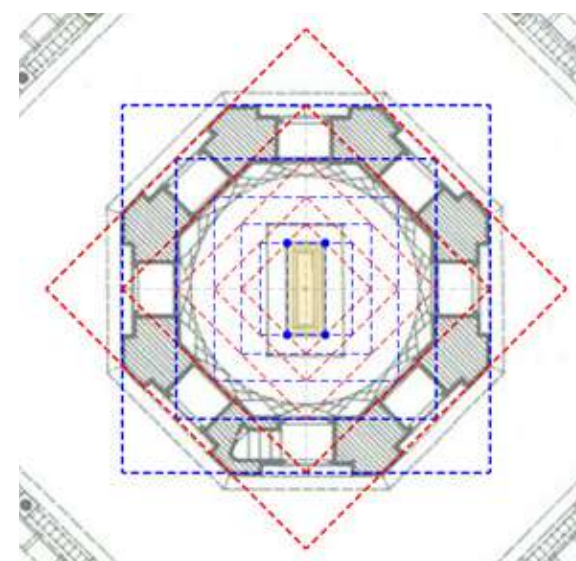


Figure 11: Geometric analysis of Saheli Burj – Plan – Step 03

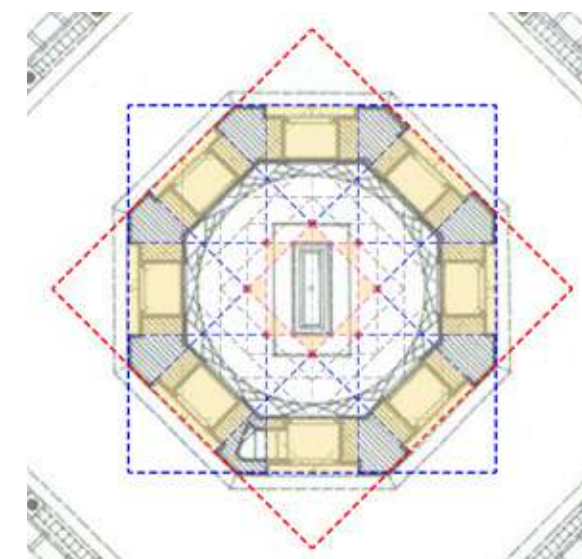


Figure 12: Geometric analysis of Saheli Burj – Plan – Step 04

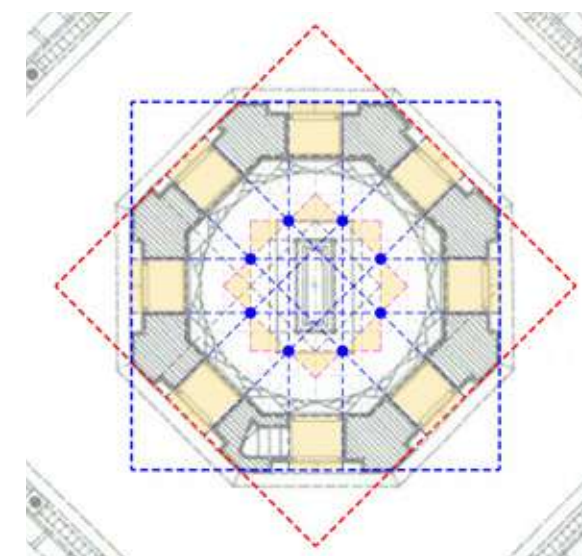


Figure 13: Geometric analysis of Saheli Burj – Plan – Step 05

Analysis of the Section on a Drawing by Ebba Koch (2006: 121)

Step 01. This time, starting with two rotating squares from the inner chamber (highlighted in magenta), a series of circumscribing rotating squares expanding outward give the main proportions of the section (Fig. 14).

Step 02. The height of the room is equal to its width (7 gaz), the limits of the dome and its *maujpa* (the inverted lotus element below the finial, *kalash*), and some minor heights: roof, parapet, parapet molding, and the lotus tips on the thin minarets at the eight corners of the veranda (Fig. 15).

Step 03. Duplicating the ground-floor series of circumscribing rotated squares on the first floor, starting

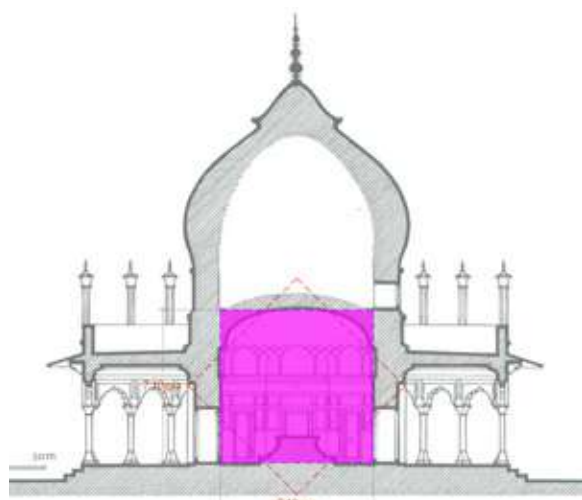


Figure 14: Geometric analysis of Saheli Burj – Section – Step 01

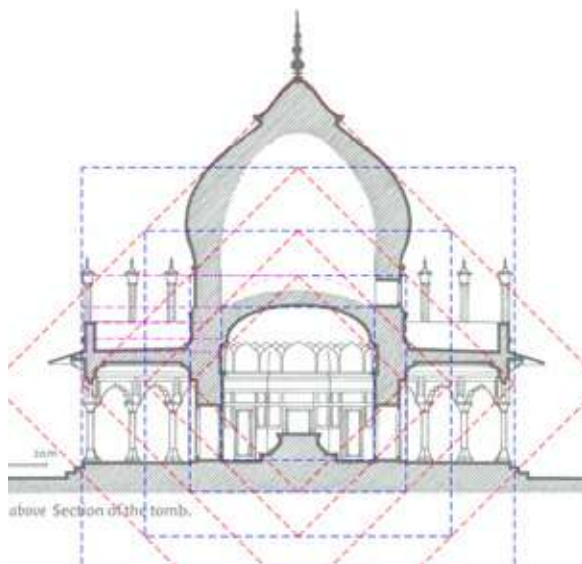


Figure 15: Geometric analysis of Saheli Burj – Section – Step 02

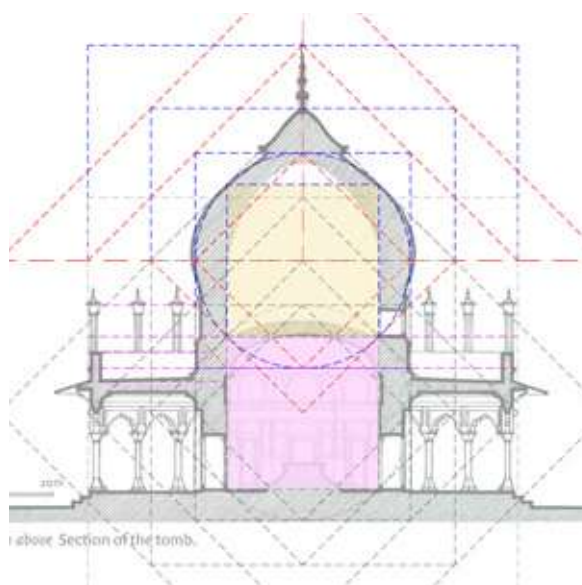


Figure 16: Geometric analysis of Saheli Burj – Section – Step 03

with the square highlighted in yellow, gives the heights of the finial and inverted lotus elements. The intersection of the two systems gives the width of the lotus elements (Fig. 16).

Gaz-Grid Analysis (According to the Shahjahani Gaz) on a Drawing by Ebba Koch (2006: 121)

Plan (Fig. 17):

Grave width	= 1 gaz
Grave platform width	= 2 gaz
Chamber inner wall	= 3 gaz
Chamber width	= 7 gaz
Chamber outer wall	= 4.25 gaz
Chamber outer width	= 10.28 gaz
Chamber outer width including overhang	= 11 gaz
Veranda ambulatory	= 5 gaz
Veranda inner width	= 19 gaz
Veranda outer width	= 20 gaz
Building width with overhang	= 23 gaz

Section (Fig. 18):

Heights:

Inner cornice	= 4 gaz
Ceiling	= 7 gaz
Dome drum	= 2 gaz
Drum base	= 2 gaz
Pencil minarets	= 4 gaz
Roof to lotus finial	= 11 gaz
Lotus finial	= 2 gaz
Top finial	= 3 gaz
Dome	= 7 gaz
Ground to parapet top	= 7 gaz
Floor to finial top	= 21 gaz

Widths:

Veranda outer width	= 20 gaz
Lotus finial	= 4 gaz
Dome pedestal	= 10 gaz
Total width	= 23 gaz
Grave width	= 1 gaz
Grave platform width	= 2 gaz
Chamber inner wall	= 3 gaz
Chamber width	= 7 gaz
Chamber outer wall	= 4.25 gaz
Chamber outer width	= 10.28 gaz
Chamber outer width including overhang	= 11 gaz
Veranda ambulatory	= 5 gaz
Veranda inner width	= 19 gaz
Veranda outer width	= 20 gaz
Building width with overhang	= 23 gaz

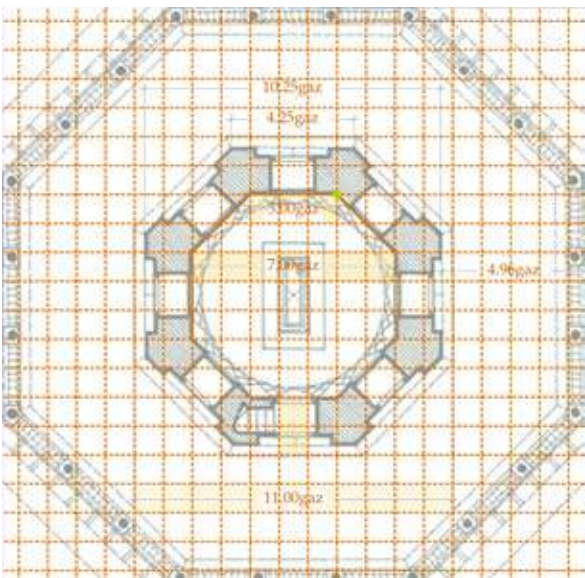


Figure 17: Geometric analysis of Saheli Burj – Plan – Grid analysis

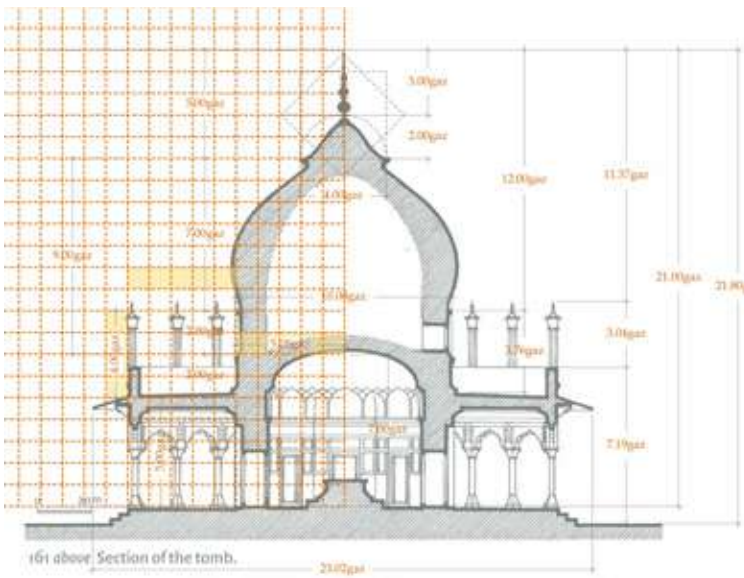


Figure 18: Geometric analysis of Saheli Burj – Section – Grid analysis

Geometric Analysis of the Tomb of Fatehpuri Begum or Satti-un-Nisa Khanum

Our second analysis is of the plan of the tomb of Fatehpuri Begum or Satti-un-Nisa Khanum (d. 1647) (Fig. 19), by the west wall of the Taj Mahal complex (Fig. 7, highlighted

in orange). It has also been identified as that of Satti-un-Nissa Khanum, lady-in-waiting of Mumtaz Mahal (Koch 2006: 120).

Analysis of the Plan on a Drawing by Ebba Koch

Starting from the tomb chamber, one set of rotating squares gives us the wall thickness, but the next set of circumscribing (expanding) squares misses the building's outer limit by a small margin. As we will see in the gaz-grid analysis below, this is to adjust to the underlying linear-yard (gaz) grid. Inscribing (inward) we get a set of rotating squares, and extending their intersection points gives us a square in which the length of the grave sits exactly, while the rotation of this inner square and the mutual intersections give us the grave width (Fig. 20).

Gaz-Grid Analysis (According to the Shahjahani Gaz) on a Drawing by Ebba Koch

Grave width	= 1 gaz
Grave length	= 2.5 gaz
Chamber inner entrance	= 1.5 gaz
Chamber width	= 9 gaz
Chamber wall length	= 4 gaz
Interior recessed arched panels width	= 3 gaz
Tomb entrance width	= 4 gaz
Tomb entrance depth	= 2.25 gaz
Tomb outer side	= 7 gaz
Building width	= 17 gaz

Note: the blue dots and dashed lines mark grid intersections and their connecting lines (Fig. 21).

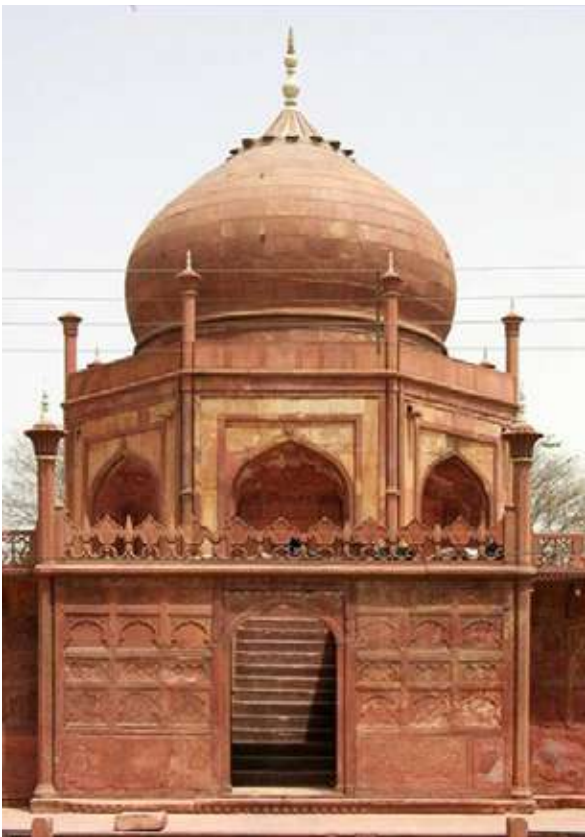


Figure 19: Tomb of Fatehpuri Begum, Agra (ArchNet)

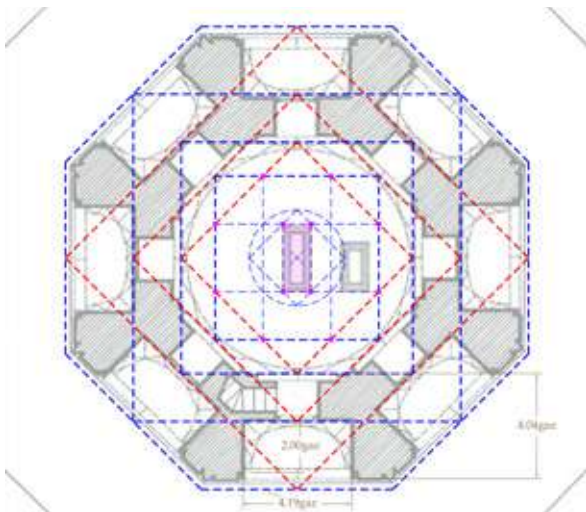


Figure 20: Geometric analysis of the tomb of Fatehpuri Begum, Agra – Plan

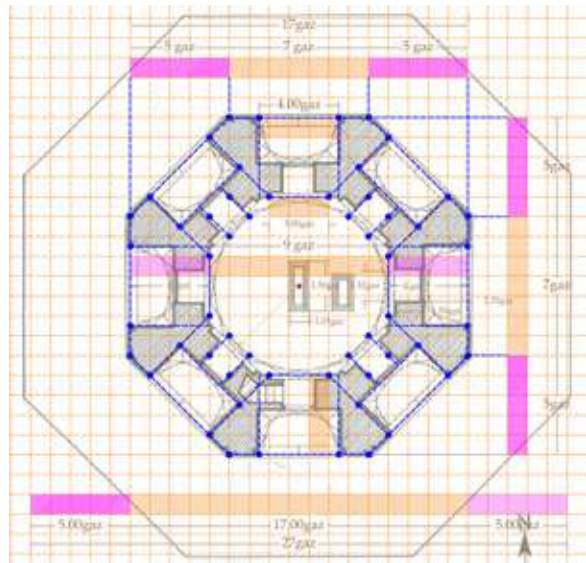


Figure 21: Gaz-grid analysis (left), according to the shahjahani gaz of the tomb of Fatehpuri Begum, Agra – Plan

Interpretation in the Light of Bulatov’s Study

Thus, a geometric system based on inscribed squares and a modular system based on the Mughal yard (the *ilahi gaz*⁴) are simultaneously present in these buildings. This relates directly to the design process and geometric systems presented in the study of Timurid architecture by Lisa Golembeck and Donald Wilber, *The Timurid Architecture of Iran and Turan* (1988). Their comments in turn draw on the work of the Uzbek scholar Mitxat Sagadatdinovich Bulatov, *Geometric Harmonisation in the Architecture of Central Asia, IX – XV Centuries* (1978).

According to Golombek and Wilber (1988), the design of a traditional Timurid building would use two processes simultaneously, namely “geometric” and “analytical.”

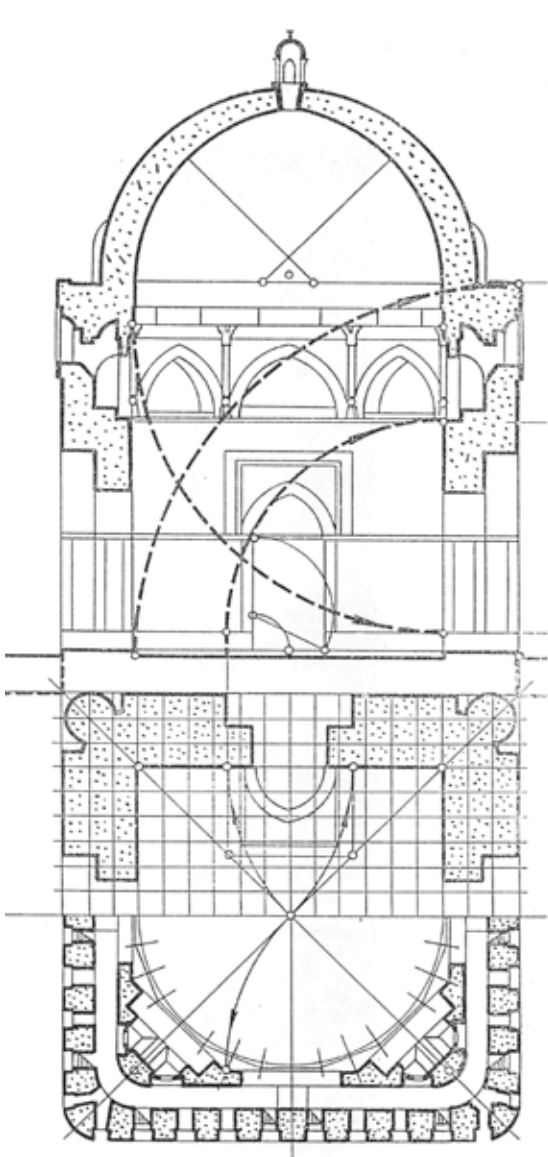


Figure 22: Tomb of Ismail Samani, Bukhara, 907 AD. Section and plan (Bulatov 1988)

Thus, first the design was drawn more or less theoretically, according to geometric proportions, and then the analytical process was applied, and one dimension was selected as a module. In Timurid buildings the module was equal to the wall thickness, also equal to or commensurate with the *gaz*, which in early Timurid buildings averaged around 24 inches (61 cm). The module was further subdivided for details. The architect could therefore specify measurements in terms of rational numbers (Golembeck and Wilber 1988: 139).

In the system described by Bulatov, firstly a measurement—the “generative unit”—had to be chosen. This was a single element, often the most prominent feature (e.g., the central chamber of the tombs analyzed above). All important dimensions in plan, elevation, and section would be

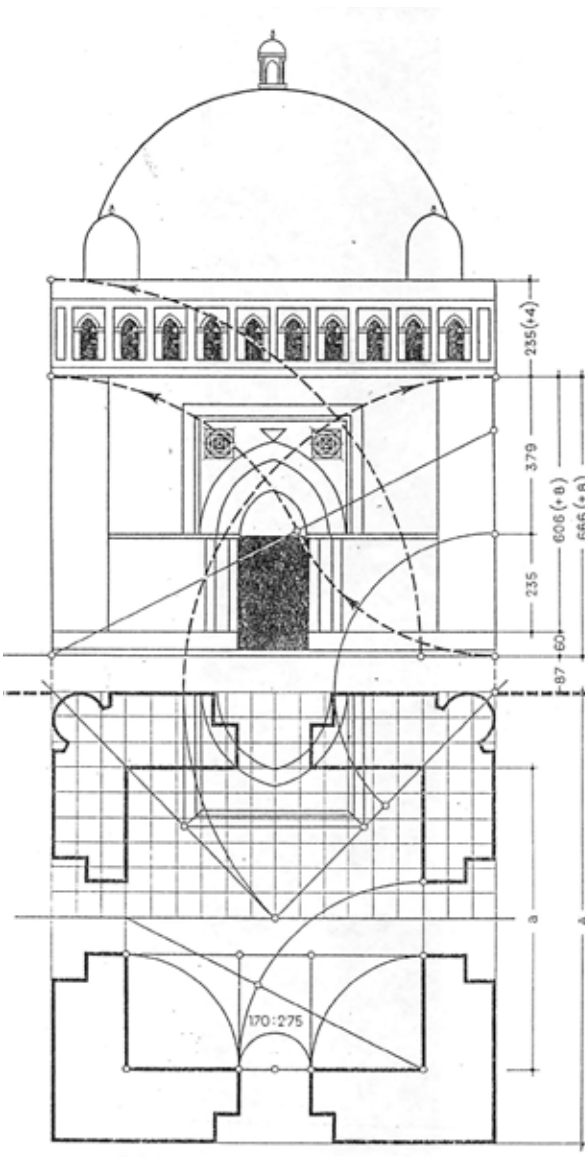


Figure 23: Tomb of Ismail Samani, Bukhara, 907 AD. Elevation and plan (Bulatov 1988)

commensurable with this. That two systems, analytical and geometric, were used is borne out by analyses of buildings exhibiting both proportional and modular systems. Figures 22 and 23, taken from Bulatov’s study, illustrate the use of such systems in the tomb of Ismail Samani in Bukhara (907 AD).

Historically, this “modular” aspect of architecture can be seen at work from some of the earliest architectural drawings available to us (Fig. 10):

This fragmentary architectural drawing shows part of a small shrine [...]. The measurements of the walls are written from right to left, and each begins with a hieroglyph in the shape of a forearm, which means “cubit,” the Egyptian unit of length. This symbol is followed, in



Figure 24: Architectural Drawing of a Garden. Ancient Egypt, ca. 1550–1295 BC (The Metropolitan Museum of Art)



Figure 25: Plan or drawing tablet excavated in Sippar-Yahrurum (Tell Abu Habbah), dated to the Neo-Babylonian period (ca. 626-539 BC) and now in the British Museum, London

each case, by a number: an elongated semicircle stands for ten, and a stroke stands for one. Thus, the width of the orchard is thirty-two cubits (The Metropolitan Museum of Art).

Similarly, the use of the grid as a tool for this modular aspect is attested to in one of the earliest architectural drawings (Fig. 25). This shows a gridded plan on a clay tablet from the Neo-Babylonian period (ca. 626-539 BC), while the ancient Indian architectural manuals known as the *Vastu Shastras* also attest to the use of grids and modular proportioning (Meister 1985). Analyses of classical Greek architecture have likewise shown the use of both these methods, i.e., “geometric” and “modular” (Jones 2006; Leonardis 2016).

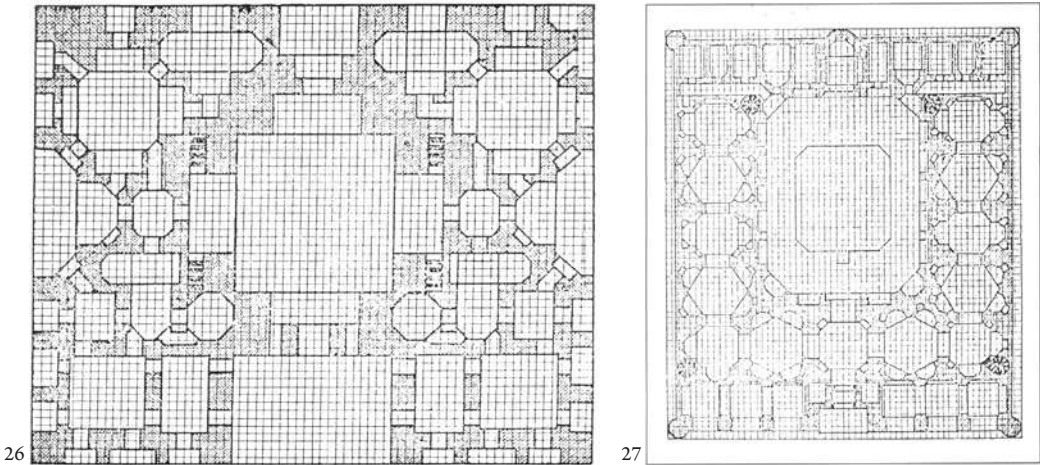


Figure 26: Drawing by the Bukharan Master, probably sixteenth century (Holod 1988)
Figure 27: Drawing by the Bukharan Master, probably sixteenth century (Holod 1988)

In the case of Mughal architecture, we have the famous Mughal miniature (Fig. 1) showing the first Mughal king, Babur, supervising the laying out of a garden in Kabul while an architect stands by with what appears to be a drawing board with red coating on which a grid can be seen engraved (probably with a layout drawing), pointing to this same tradition. The use of grids by Timurid architects is also attested to, for example by the drawings of the “Bukharan Master” (Figs. 26 and 27).

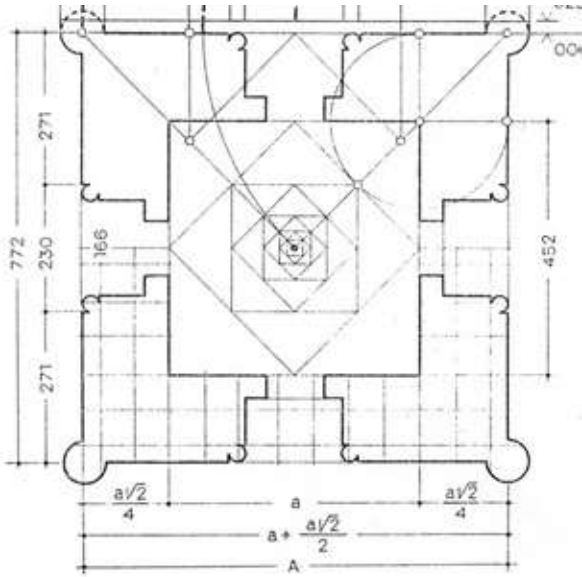


Figure 28: Mausoleum of Aisha-Bibi, part of Bulatov's illustration for Table 1 (Bulatov 1988: 111)

Table 1

Divisions of $\sqrt{2}$ & a	$a\sqrt{2}$	a	$\frac{a\sqrt{2}}{2}$	$\frac{a}{2}$	$\frac{a\sqrt{2}}{4}$	$\frac{a}{4}$	$\frac{a\sqrt{2}}{8}$	$\frac{a}{8}$	$\frac{a\sqrt{2}}{16}$	$\frac{a}{16}$	$\frac{a\sqrt{2}}{32}$	$\frac{a}{32}$
Modular Approx.	10	7	5	3.5	2.5	1.75	1.25	7/8	5/8	7/16	5/16	7/32

What is evident from Bulatov's studies and also our own analyses above is that the grid's primary function is to convert a geometrically generated design into whole numbers and fractions commensurable with the yard (the Mughal *ilahi gaz*) and thus easily usable on site, as opposed to the irrational numbers which a purely geometrically generated proportioning system would yield.

The use of graph paper is most significant. It tells us that the draftsmen worked with compasses and straight edges, the ancient tools of Euclidean geometry. Any geometric form was quickly plotted out, making transformations of inscribed polygons, diagonals, and segments. Bulatov sees this series of transformations as all-important, extending into three dimensions and determining elevations (Holod 1988: 6).

See also Yasser Tabba's two case studies (1988) from Aleppo and Damascus on the use of the modular grid as well as of geometric proportioning. Necipoğlu (1996) covered the same ground as Holod (1988) but with the addition of Ottoman plans using modular grids. Koch's work over more than two decades of measuring and drawing Mughal buildings led her to similar conclusions regarding the use of a modular grid in the Taj Mahal (Koch 2006: 108-109) and the length of the Mughal yard (Koch 1991 and 2006).

This use should be understood in the context of a category of mathematical and geometric methods from pre-Euclidean times for the expression of root powers ($\sqrt{2}$, $\sqrt{3}$, or $\sqrt{5}$) as a succession of whole-number ratios. “These successive ratios approach nearer and nearer to the root

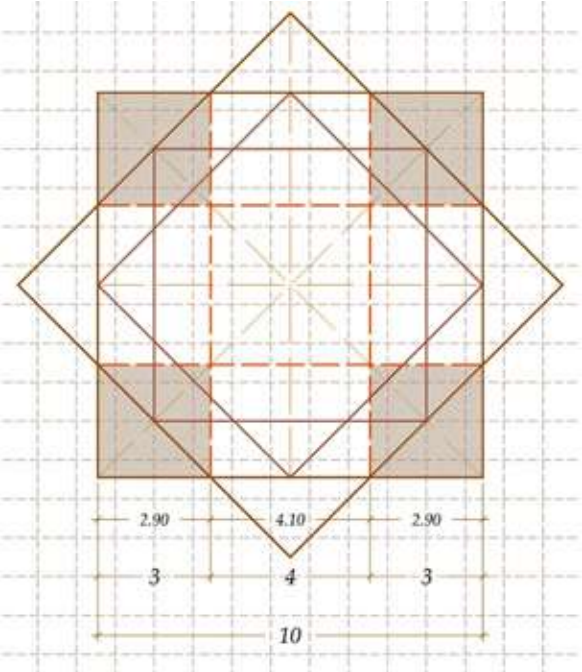


Figure 29: Hasht Bihisht division of a 7x7 square

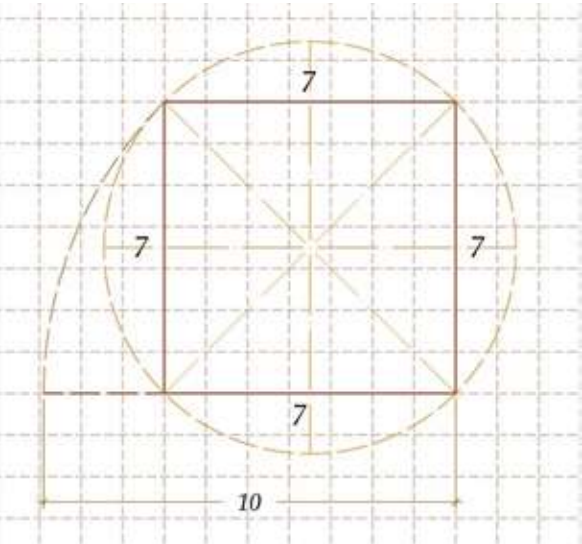


Figure 30: Approximation of the diagonal of a 7x7 square

value with each alternation” (Lawlor 1994: 39). Likewise, number series were used to generate approximations of root functions, the Fibonacci series being a well-known example, for generating the golden ratio. “Similarly a method known as the Diaphantine method—the generation of whole number ratios approximating incommensurable functions—is attributed to the Greek mathematician Diaphantus” (Lawlor, 1994: 67). The works of Diaphantus were translated into Arabic by Qusta ibn Luqa in the tenth century (Nasr 1968: 149).

In the case of Bulatov's analyses, the irrational geometry is approximated in terms of the module and its subdivisions.

Table 1 (where a = generative unit) shows a set of such conversions, given by Bulatov (1988: 112) and borne out by his analyses of Central Asian monuments (Fig. 28).

According to Golombek and Wilber (1988: 140), the geometric system used in Timurid architecture “... aside from its practical value as a working method, ensured a harmony of parts, whereby all parts were related to a single entity.”

A grid of square “units” naturally lends itself to graphically representing these mathematical methods. As an illustration of the use of the grid to approximate incommensurable measurements resulting from root functions (the diagonal of the square in this example), figure 29 shows the *Hasht Bihisht* division of a square of 7x7 units. This is given by the intersections of two rotating squares as well as by the arc formed from the square's corners to the midpoint of its diagonal to the side of the square. The diagonal of a square of 1x1 unit is $\sqrt{2}$ units, i.e., the irrational number 1.414213..., hence the half-diagonal $\sqrt{2}/2$ for a square of 7x7 units would be $\sqrt{2}/2 \times 7 = 4.949747$.

The smaller portion of the octagonal division (hatched in Fig. 29) is $7 - 4.949747 = 2.05025$ (rounded to 2.05 in Fig. 29), while the central division is $7 - (2 \times 2.05025 \dots) = 2.89949$ (rounded to 2.90 in Fig. 29). The grid gives us whole-number approximations of these, i.e., 2, 3, and 2 (Fig. 29).

Figure 30 shows the approximation of the diagonal of a square of 7x7 units. The diagonal of a square of 1x1 unit is $\sqrt{2}$ units, i.e., the irrational number 1.414213..., hence the diagonal for a square of 7x7 units would be $\sqrt{2} \times 7 = 9.8994949 \dots$. In figure 29 the grid gives the approximation of the diagonal as 10.

Bulatov's conclusions regarding the connection between mathematics, architecture, and geometry, as well as the above grid method, are understandable when we recall that historically there was a close connection between architecture and geometry. “According to the tenth century philosopher, Abu Nasr al-Farabi, the fundamentals of architecture belonged to the mathematical sciences” (Golombek and Wilber 1988: 137). Golombek and Wilber also state that “Geometry was the foundation of an architect's training, and the highly skilled architect was known as *muhandis*, a “geometer.”

That Mughal architects were similarly skilled is confirmed by the information we have about them. We know this regarding Ustad Ahmad Mimar Lahori, *chief architect during the reign of Shah Jahan*, and from Begley and Desai's *Anthology of Seventeenth-Century Mughal and European Documentary Sources* (1989), on the Taj Mahal and its designers. The family of Ustad Ahmad were not only architects but also geometers, mathematicians, and astronomers, as well as poets. This is attested to by the

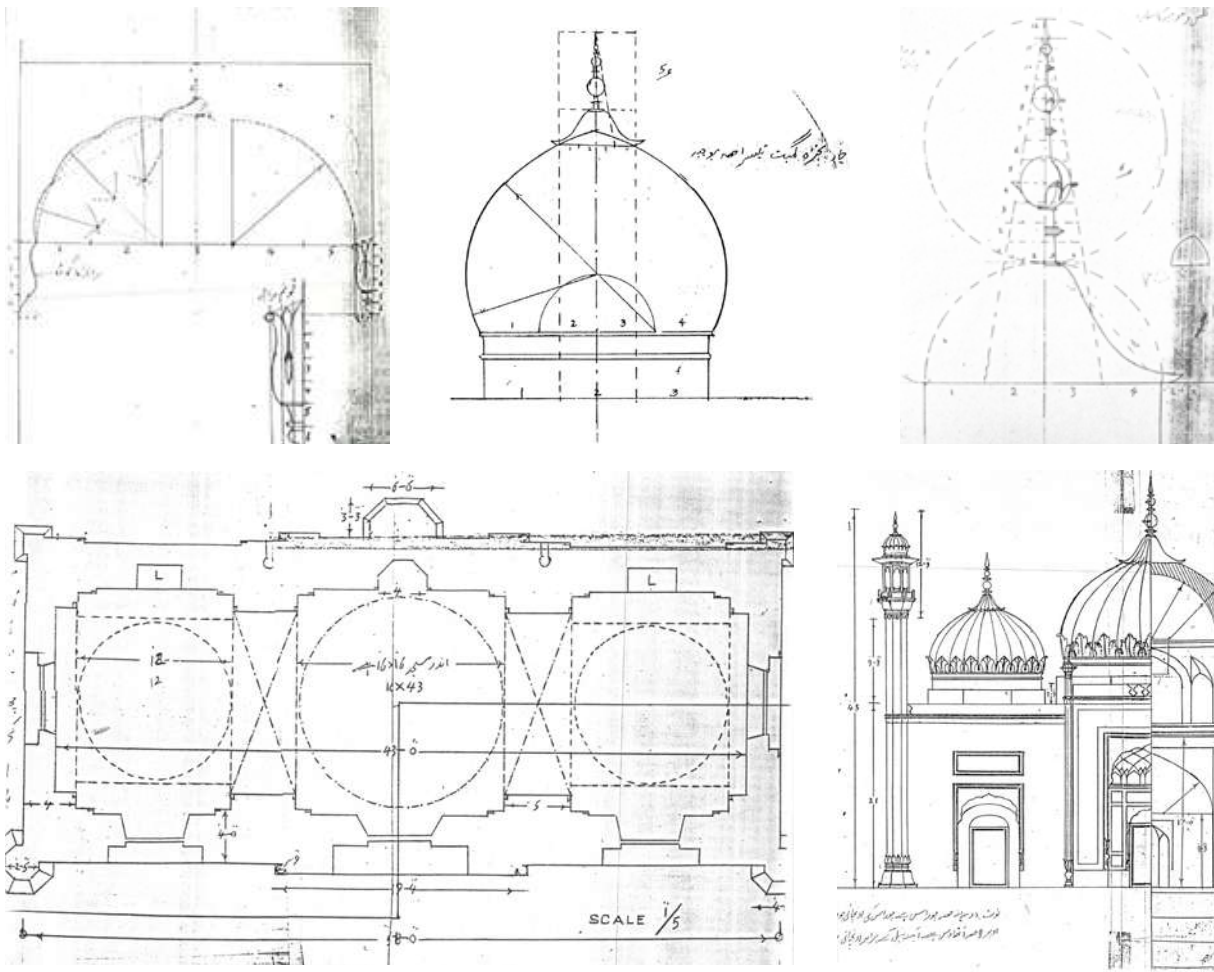


Figure 31: Merabi (arch) in “Punjabi” shape (Ustad 1970s)
Figure 32: 4-part dome with 1/3 part maujbah (inverted lotus) (Ustad 1970s)
Figure 33: Kalas (finial) and maujbah (inverted lotus) proportioning system (Ustad 1970s)
Figure 34: Multan mosque ground plan (Ustad 1977)
Figure 35: Multan mosque half sectional elevation (Ustad 1977)

following verses from Ustad Ahmad’s youngest son Lutf Allah’s collection *Diwan-i Muhandis*, “The Geometer’s (Muhandis) Poetry Collection (*Diwan*)” (Begley and Desai 1989):

3. Ahmad the architect (mimar), who in his art
Was a hundred steps ahead of the masters of this art.

4. Conversant with Euclid’s Propositions (Tahrir) and
its Discourses,
And acquainted with all their particulars.

5. The movements of the planets and stars had become
known to him,
The mysteries of the *Almagest* had been understood by
him.

9. At the orders of the world-conquering king,
He constructed the edifice of the tomb of Mumtaz Mahal
(*Taj Mahal*).

14. From the wonderful man, three sons remained,
Of those three, Ata Allah Rushdi (or Rashidi) is the
eldest.

15. He was a cherisher of skill and the master of his
profession
Accomplished and learned, and a savant of the Age.

23. I am the second of those three brothers;
Mathematics (hindsa) is only one of my hundred arts.

25. The third of those three brothers, in years,
Is Nur Allah, the Master of Perfection.

26. We all are architects and builders;
We all are master cherishers of speech (poets).

31. The treasure of art has come within his grasp;
He is an expert calligrapher in all the seven scripts (haft-
qalam).

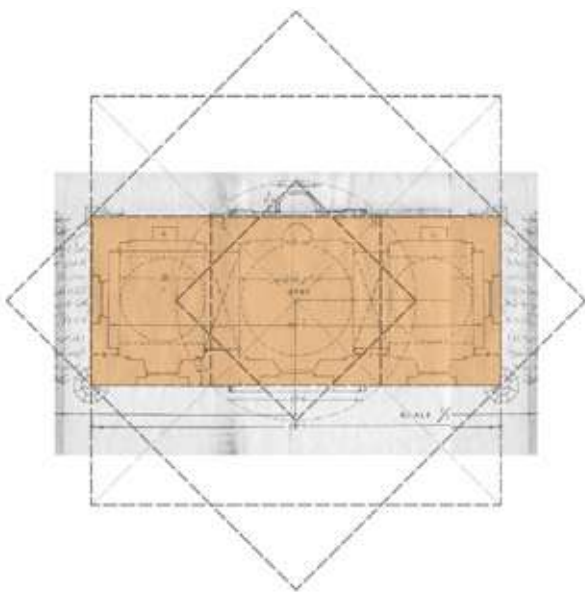


Figure 36: Geometric analysis by Ustad (1977) of a mosque ground plan

33. Even though Muhandis [geometrician] is my title,
You should instead seek geometry from those two
brothers.

One also finds evidence of the above manner of working in an unpublished twentieth-century 30-page handbook of assorted drawings (Figs. 31-33) by the late master mason Ustad Rahim Bukhsh, of the historic Pakistani city of Multan. The drawings of various elements of traditional mosque architecture clearly show the impact of geometry on the design of such elements, both as a practical tool for drawing or constructing forms such as domes, arches, geometric patterns etc., and as a means of creating a harmony of parts through proportioning.

Two of the drawings have dates on them: 1974 and 1977, probably the last. The final set is of a complete ensemble, namely a mosque (Figs. 31 and 32), making a logical conclusion, as all the elements illustrated—arches, domes, minars, chatris, etc.—thereby come together to make a whole.

Analysis of the Mosque Ground Plan

The ratio between the mosque’s length and width—58 ft : 24 ft, i.e., 17.68 m : 7.32 m—accurately expresses the irrational relationship $A : A(\sqrt{2} - 1)$ geometrically determined by the intersections of two squares rotated at 45 degrees (Fig. 36). A grid of 2” x 2” overlaid on the left quarter of the mosque plan and another of 1” x 1” on its right half clearly show that the planning follows a network based on imperial feet and inches (standard units used in contemporary building practice) (Fig. 37).

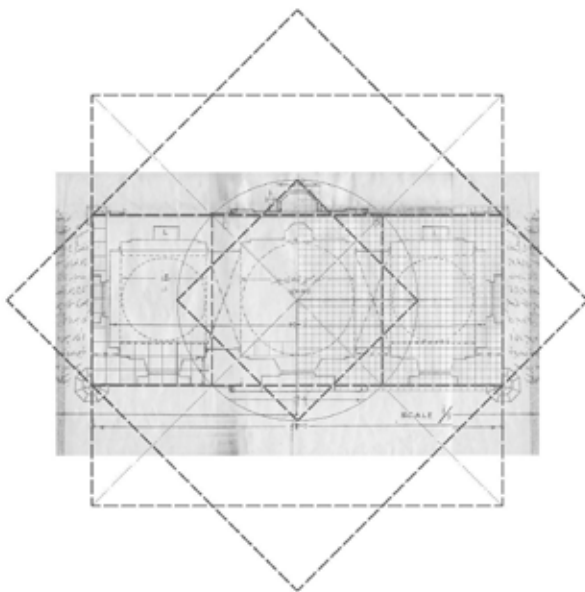


Figure 37: Grid analysis by Ustad (1977) of a mosque ground plan

The analyses presented here show the continuity of these principles and methods not only between the classical Mughal period and the work of contemporary master masons but also further back in Central Asian architecture, common perhaps with broader Islamic design (Tabba 1988). This continuity appears in Koch’s considerations (1990) regarding Mughal architecture’s “Timurid link”. In addition, in the sixteenth century, Central Asia was seen as the touchstone of cultural standards and taste, and as a result the early Mughal buildings were openly modelled on Timurid ideals (Koch 1990). Lastly, we may recall that the Muslim community in the region—Central Asia, Transoxiana, Iran, Afghanistan, and India—was a cultural continuum (Richard C. Foltz 1998).

Our findings point to the possibility of taking this research further by applying these methods to other buildings so as to get a more nuanced understanding of design processes used in the Subcontinent. This is in addition to the usefulness of such analyses in learning to use these methods and principles in contemporary design.

Conclusion: Interpretation in the Light of Traditional Cosmology

Bulatov (1978 and 1988) as well as Golombek and Wilber (1988) in the case of Timurid architecture, and Koch in the case of the Mughal tradition (2006), have pointed to the need to place architecture in the cultural context of Islamic civilization and its ideals of beauty and harmony. We too have tried to do this. Taking this logic further, it would be fruitful to situate these design methods in the framework of traditional Islamic cosmology, as this cosmology springs

from the same worldview in which this architecture was created and which indeed underpins all the various traditional Islamic arts and sciences (Nasr 1978).

Islamic cosmology, like other premodern cosmologies, sees creation as having two main aspects: on the one hand, “quantitative,” “material,” and “measurable,” and on the other, “qualitative,” “immeasurable,” and “essential.” In the Islamic tradition this duality is often represented by the terms *surah* and *ma’na*—“outer form” and “essence-reality.”

*This is the world of “form” (surat) and we live in “forms”;
The “Essence-Reality” (ma’na) cannot be seen save by means of “form.”*

Awahad al-Din Kirmani (1163–1238)

This is analogous to other traditions. For example, in Hindu culture, *Purusha* and *Prakriti* (Stoddart 1993) stand for these principles in relation to the whole of creation, and

naam (“name,” “essential reality”) and *rupa* (“outer form”) in relation to individual entities (Coomaraswamy 1934). In the Aristotelian hylomorphic cosmological paradigm, adopted by the Islamic tradition, *hyle* (“wood,” meaning “matter/material”) and *morphe* (“form,” meaning “essence” or “quiddity,” i.e., “what” a thing is, e.g., “man,” “tree,” etc.), stand for these two aspects (Smith 1995). The medieval Western scholastic terminology for them—*materia et forma*—is based on the Aristotelian conception received through Muslim philosophers such as Averroes (Ibn Rushd) and Avicenna (Ibn Sina) (Stanford Encyclopedia of Philosophy 2022).

Consider a marble statue. The marble is the matter of the statue whereas the shape signifies the “form” of the statue. The marble is the “stuff” out of which the statue is made whereas the shape signifies the “form” that the artist decided to give to the statue. On a more metaphysical level, “form” is the principle whereby “matter” has the particular structure that it has, and “matter” is simply that which stands to be structured in a certain way. (Internet Encyclopedia of Philosophy).

The equivalent terms for *materia* and *forma* suggested by the French Muslim Sufi philosopher René Guénon in *The Reign of Quantity and the Signs of the Times* (1945) are “substance” for *materia* and “essence” for *forma*, and as applied to materially existing entities, he suggests the terms “quantity” and “quality.” This framework is paralleled in the concepts and methods of traditional Islamic art and architecture (Burckhardt 1976), as in the arts of other traditions (Coomaraswamy 1934).

Applying this framework to Mughal architecture would mean that the use of the grid refers to the “measurable,” “quantitative” aspect, while geometric proportioning refers to the “qualitative” aspect, the source and “essence” of beauty and harmony.

According to this cosmological scheme, we could say that the study of the various planning grids at the Taj Mahal discerned by Ebba Koch (2006: 108-109) shows primarily the “quantitative” half of design. The planning grids were “measuring” and “laying-out” tools. The “qualitative” half, the source of timeless beauty, lies in its underlying geometric proportioning. We believe this to be demonstrated by our analysis of the two tombs above, and of the two elevations presented below.

In conclusion, we may recall that the “universal” cosmology outlined above was overturned on the adoption of Descartes’s scientific method (Smith 1995), inaugurating the scientific revolution but also leading to the Cartesian split in Western philosophy’s conception of reality. The world and with it humankind were divided into irreconcilable compartments, namely “quantity” and “quality,” with the difference that only the “quantitative” aspect was considered objectively “real,” because of being

“measurable,” while “qualities” (including beauty) were relegated to the “subjective” realm. This scientific method, which underpins modern academic enquiry, including in art history, arguably limits us to one half of reality. For a meaningful art-historical investigation doing justice to its subject and bringing full appreciation, we should perhaps look at art and architecture in accordance with the worldview from which they emerge.

In our analysis of two Mughal tombs we looked at two plans and one section, and so we now end with analytical elevations of two outstanding Mughal monuments: the Taj Mahal (1632-1648) in Agra (Figs. 38 and 39)⁵, built by Shah Jahan, and the Badshahi Mosque (1671-1673) in Lahore (Figs. 40 and 41), built in the reign of Shah Jahan’s successor Aurangzeb Alamgir, once again combining the measurable and the immeasurable.

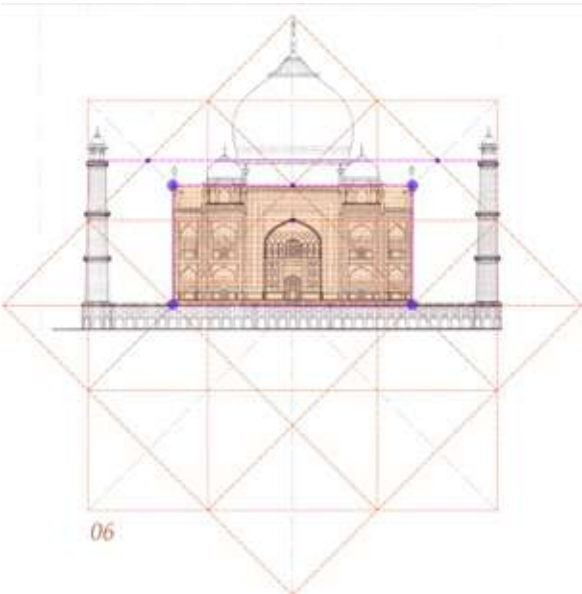


Figure 38: Taj Mahal (partial analysis). The basic *Hasht Bihisht* framework of two rotating squares at 45 degrees and the lines joining their intersections give us many of the monument’s main widths and heights (Koch 2006: 154)

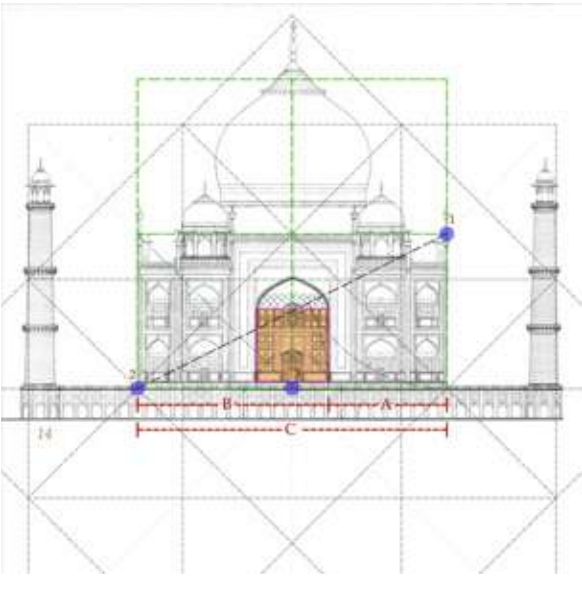


Figure 39: Taj Mahal (partial analysis): use of the “golden cut” for establishing the central *ivan* (double-height archway) width. Using the Euclidean method of bisecting the semi-diagonal of a double-square rectangle, the length C is divided into lengths A and B, where the ratio of A:B : B:C is equal to the golden ratio (Koch 2006: 154)

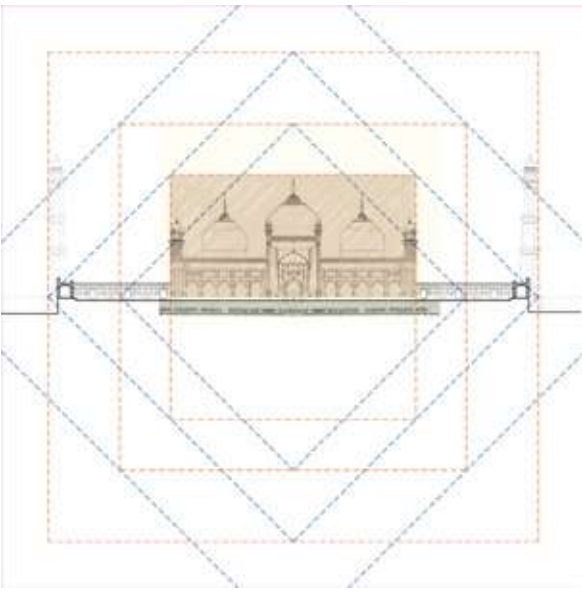


Figure 40: Badshahi Mosque (partial analysis): starting from the edges of the outer minarets, a series of inscribed rotating squares brings us to the mosque’s width and height in three steps (Chughtai 1957)

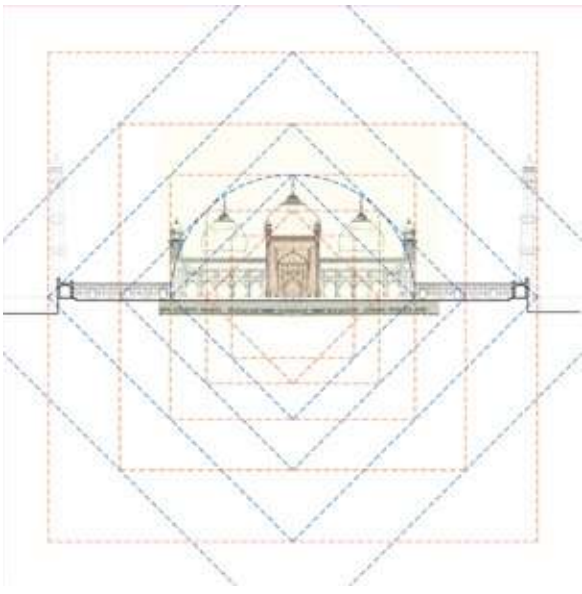


Figure 41: Badshahi Mosque (partial analysis): continuing the series of inscribed rotating squares further inward gives us the width and height of the central *ivan* (double-height central archway) (Chughtai 1957)

References | Referencias | Referências

Begley, Wayne Edison; and Desai, Ziyaud-Din A. 1989. *Taj Mahal: The Illuminated Tomb: An Anthology of Seventeenth-century Mughal and European Documentary Sources*. Cambridge: Aga Khan Program for Islamic Architecture.

Bulatov, Mitxat Sagadatdinovich. 1978. *Geometric Harmonisation in the Architecture of Central Asia, IX – XV Centuries*. Moscow: Nauka Publishers.

Burckhardt, Titus. 1976. *The Art of Islam Language and Meaning*. London: World of Islam Festival Publishing Company.

Chughtai, Muhammad Abdullah. 1957. *Ustad Ahmed Mimar Lahori and His Family*. Lahore.

Coomaraswamy, Ananada Kentish. 1934. *The Transformation of Nature In Art*. New York: Dover Publications.

Crane, Howard. 1987. *Risāle-i mi‘māriyye: an early-seventeenth-century Ottoman treatise on architecture : Facsimile with translation and notes*. Leiden: Brill.

Guenon, Rene. 1972 [1945]. *Reign of Quantity and the Signs of the Time*. London: Penguin Books.

Golombek, Lisa; and Wilber, Donald. 1988. *The Timurid Architecture of Iran and Turan*. Princeton University Press.

Holod, Renata. 1988. Text, Plan and Building: On the Transmission of Architectural Knowledge. In Sevcenko, Margaret Bentley (ed.), *Theories and Principles of Design in the Architecture of Islamic Societies*. Cambridge: Aga Khan Program for Islamic Architecture.

Internet Encyclopedia of Philosophy. *Aquinas: Metaphysics*. <https://iep.utm.edu/thomas-aquinas-metaphysics>. (consulted on 12/05/2025)

Jarrett, H.S. (tr.). 1949. *Ain-i-Akbari of Abul Fazl-i-'Allami*. Calcutta: Royal Asiatic Society of Bengal.

Jones, Mark Wilson. 2006. Ancient Architecture and Mathematics: Methodology and the Doric Temple. *Nexus VI: Architecture and Mathematics*, 6: 1-20.

Koch, Ebba. 1991. *Mughal Architecture*. Munich: Prestel–Verlag.

Koch, Ebba. 2006. *The Complete Taj Mahal and the Riverfront Gardens of Agra*. London: Thames and Hudson 2006.

Leonardis, Rocco. 2016. Geometry in Greece The Use of Geometry by Ancient Greek Architects. In Miles, Margaret M. (ed.), *A Companion to Greek Architecture*. New York: John Wiley & Sons.

Meister, Michael W. 1985. Measurement and Proportion in Hindu Temple Architecture. *Interdisciplinary Science Reviews*, 10, 3: 248-258.

Nasr, Seyyed Hosein. 1978. *An Introduction to Islamic Cosmological Doctrines*. London: Thames & Hudson.

Necipoglu, Gulru. 1996. *The Topkapi Scroll: Geometry and Ornament in Islamic Architecture*. Los Angeles: Getty Publications.

Neihardt, John G. 1972. *Black Elk Speaks, Being the Life Story of a Holy Man of the Oglala Sioux*. New York: Washington Square Press.

Rossi, Corinna. 2007. *Architecture and Mathematics in Ancient Egypt*. Cambridge: Cambridge University Press.

Sevcenko, Margaret Bentley (ed.). 1988. *Theories and Principles of Design in the Architecture of Islamic Societies*. Cambridge: Aga Khan Program for Islamic Architecture.

Smith, Wolfgang. 1995. *The Quantum Enigma, Finding the Hidden Key*. New York: Angelico Press.

Stanford Encyclopedia of Philosophy. 2022. *Thomas Aquinas*. <https://plato.stanford.edu/entries/aquinas/#FormMatt> (consulted on 12/05/2025)

Stoddart, William. 1993. *Outline of Hinduism*. Bloomington: Foundation for Traditional Studies.

The Metropolitan Museum of Art. *Architectural Drawing of a Garden*. <https://www.metmuseum.org/art/collection/search/544801> (consulted on 18/04/2025)

Ustad, Rahim Bakhsh. 1970s. *Handbook of Assorted Architectural Drawings*. Unpublished.

Wittkower, Rudolf. 1973. *Architectural Principles in the Age of Humanism*. London: Academy Editions.

Biography | Biografía | Biografia

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Óscar Rafael Cruz Vázquez, Luis Fernando Guerrero Baca

“Ear-Roofed” Houses in Mixteca Baja, Puebla State: The Ñuu’Davi Traditional Building System

La casa de “techo de oreja” en la Mixteca Baja de Puebla: Sistema constructivo tradicional Ñuu’Davi

A casa de “telhado de orelha” na Mixteca Baja de Puebla: Sistema construtivo tradicional Ñuu’Davi

Keywords | Palabras clave | Palavras chave

Traditional architecture, Mexico, Ethnography, Santo Domingo Tonahuixtla, Vernacular architecture

Arquitectura tradicional, México, Etnografía, Santo Domingo Tonahuixtla, Arquitectura vernácula

Arquitetura tradicional, México, Etnografia, Santo Domingo Tonahuixtla, Arquitetura vernácula

Abstract | Resumen | Resumo

The “ear-roofed” (*techo de oreja*) houses of the Mexican region of Ñuu’Davi are a dwelling type whose construction system has been handed down traditionally since time immemorial. Of late, socioeconomic factors have led them to fall almost wholly into disuse. But in 2024, thanks to local interest and support, a project to build a new dwelling of this type was launched, allowing the associated construction procedures to be recorded and documented. This paper presents the documentation obtained by the ethnographic method of direct observation. Our analysis takes a biocultural approach, with particular attention to traditional building know-how linked to the utilization of biodiversity and the philosophy associated with the “ear-roofed” houses of the Ñuu’Davi people.

La casa de “techo de oreja”, propia de la región Ñuu’Davi en México, constituye una tipología cuyo sistema constructivo se ha transmitido de manera tradicional desde tiempos remotos. En la actualidad, diversos factores socioeconómicos han provocado que su uso desaparezca casi por completo. En 2024, gracias a la colaboración e interés de habitantes locales, se construyó una nueva vivienda con este sistema, lo que permitió registrar y documentar sus procedimientos constructivos. El objetivo de este trabajo es presentar la documentación obtenida mediante el método etnográfico de observación directa. El análisis se desarrolló desde un enfoque biocultural, con especial atención a los saberes constructivos tradicionales vinculados al aprovechamiento de la biodiversidad y al pensamiento filosófico asociado a las casas de “techo de oreja” del pueblo Ñuu’Davi.

A casa de “telhado de orelha”, típica da região Ñuu’Davi no México, constitui uma tipologia cujo sistema construtivo tem sido transmitido de forma tradicional desde tempos remotos. Atualmente, diversos fatores socioeconômicos fizeram com que seu uso praticamente desaparecesse. Em 2024, graças à colaboração e ao interesse dos habitantes locais, foi construída uma nova moradia com esse sistema, o que permitiu registrar e documentar seus procedimentos construtivos. O objetivo deste trabalho é apresentar a documentação obtida por meio do método etnográfico de observação direta. A análise foi desenvolvida a partir de uma abordagem biocultural, com especial atenção aos saberes construtivos tradicionais vinculados ao aproveitamento da biodiversidade e ao pensamento filosófico associado às casas de “telhado de orelha” do povo Ñuu’Davi.

Introducción

La región conocida como la Mixteca abarca una amplia y variada geografía del centro-sur de la República Mexicana, habitada desde tiempos remotos por una comunidad de fuerte arraigo e identidad cultural (Cruz, Salazar y Guerrero 2024). Con la actual organización política del país, la región quedó dividida y forma parte de las entidades federativas de Oaxaca, Puebla y Guerrero.

La casa de “techo de oreja”, o *Ve’é Ñuu* (casa de palma, en mixteco), característica de la región Ñuu’Davi en la Mixteca Baja, conserva un sistema constructivo de origen prehispánico transmitido de manera tradicional hasta la actualidad. Su uso en la zona podría remontarse a antes del año 1150 a. C., fecha de la ocupación más antigua registrada en la Mixteca Baja de Puebla (Lind 2008: 14). Esta vivienda se construye principalmente con materiales naturales locales: piedra para la cimentación, tierra para los muros, madera en la estructura, palma en la cubierta, carrizos, varas o inflorescencias de agave (*quiotes*) para los entramados, y fibras extraídas de las pencas del *Agave salmiana* –conocido como *maguey*– para elaborar cuerdas denominadas *mecates*.

Algunas características tipológicas de este sistema constructivo, empleado en la Mixteca poblana, también se encuentran en culturas vecinas como los Nguivas o Popolocas. Sus viviendas fueron documentadas durante una exploración etnodemográfica e histórico-arqueológica en San Juan Ixcaquixtla y San Mateo Zoyamazalco, Puebla, a comienzos de 1951 (Cook de

Leonard 1953). Según la autora, un rasgo distintivo del pueblo Nguiva eran unas ventanas peculiares que denominó “orejas”, un detalle constructivo presente en las cubiertas y que, según ella, no era común entre otros pueblos originarios de México.

Vista lateral de las orejas de los techos Nguivas en San Mateo Zoyamazalco, Puebla, en 1951 (Cook de Leonard 1953)



Representación lateral de edificios con prolongaciones en las cumbreras de los techos en el *Códice Borgia* (Fundación para el Avance de los Estudios Mesoamericanos)



Representación de un edificio con un remate complejo que podría corresponder a un “techo de oreja” en el *Códice Sánchez-Solís* (The British Museum)

Las orejas, prolongaciones de la cubierta a dos aguas en el caballete, forman ángulos iguales al superior del gablete y se unen a sus lados. Estos elementos protegen aberturas –en su mayoría circulares– que proporcionan luz y ventilación al espacio interior. Estas soluciones, posiblemente de origen prehispánico, constituyen uno de los pocos ejemplos de “ventanas” en las casas indígenas (Cook de Leonard 1953: 430).

El estudio de esta investigadora fue pionero en la documentación de esta arquitectura, en una época en la que era común que las comunidades Nguiva y Ñuu’Davi habitaran este tipo de viviendas. Aunque no profundizó en su análisis arquitectónico, señaló que le parecían de un aspecto “nítido y esmerado”, al observar que las puntas de palma del techo se recortaban para quedar a un mismo nivel.

Además de esta documentación etnográfica, existen representaciones en códices prehispánicos que muestran espacios posiblemente ceremoniales –al estar representados sobre basamentos–, cuyos techos presentan remates singulares derivados de la prolongación del parteaguas, con una notable semejanza a las casas de “techo de oreja” documentadas por Cook de Leonard.

Un ejemplo destacado es el *Códice Borgia*, cuya procedencia se ha situado, presumiblemente, en las cercanías del Valle de Tehuacán, al sur del estado de Puebla, durante el periodo Posclásico (900–1521 d. C.). En este documento se observan similitudes con

las viviendas que, hasta hace medio siglo, todavía eran habitadas en la zona mixteca-popoloca de Puebla. Algo similar ocurre con el *Códice Sánchez-Solís* (Chadwick y MacNeish 1967: 125), posiblemente originario de la Mixteca Baja.

En 1974, Klaus Jäcklein realizó un análisis descriptivo de la comunidad Nguiva de San Felipe Otlaltepec, Puebla, en el que abordó aspectos constructivos y culturales de la tipología de vivienda de “techo de oreja”. Documentó que las casas medían entre 3.5 × 6 m y 5 × 8 m, con una altura aproximada de 5 a 7 m, y se orientaban en dirección este-oeste (Jäcklein 1974: 86). Señaló que los materiales empleados para levantar la estructura eran, por lo general, troncos de *guaje* (*Leucaena leucocephala*), *quiotes* y *huilotes* (varas de madera).

Esta singular tipología de vivienda ha tenido un uso prolongado en la región mixteca-popoloca. En el valle de Tehuacán, cercano al área de este estudio, los registros arqueológicos más antiguos documentan unidades habitacionales posiblemente techadas con palma, fechadas hacia el 3000 a. C. (Rodríguez Cano et al. 2021: 26). Algunos rasgos del sistema constructivo de la casa de “techo de oreja” en la Mixteca Baja de Puebla podrían compartir un origen común con estas antiguas viviendas. Asimismo, Rodríguez Cano et al. (2021) recopilaron mapas coloniales de la Mixteca Baja (siglos XVI–XIX) en los que se representan gráficamente casas tradicionales con una saliente en la cumbrera, posiblemente aludiendo al “techo de oreja”.

Resulta notable que esta tipología de vivienda haya perdurado hasta la actualidad en estos territorios, gracias a la transmisión constante de habilidades y saberes específicos dentro de las comunidades. No obstante, con el paso del tiempo, factores como el desprestigio cultural impuesto por sociedades externas, determinadas políticas públicas de carácter capitalista, la introducción de materiales industrializados, la migración y los fenómenos naturales han transformado los modos de vida y las formas de construir. Estas circunstancias han provocado que esta tipología esté al borde de la desaparición y que su transmisión cultural se encuentre en grave riesgo.

Ante esta problemática, en 2021 se llevó a cabo un estudio sobre esta tipología de vivienda de origen prehispánico. Desde un enfoque arqueológico, etnohistórico, etnográfico y lingüístico, un equipo de investigadores de la Escuela Nacional de Antropología e Historia (Ciudad de México) documentó las dos últimas casas de “techo de oreja” habitadas en el municipio de San Jerónimo Xayacatlán, Puebla, en la Mixteca Baja, construidas hace más de cincuenta años (Rodríguez Cano et al. 2021).

Este estudio aporta antecedentes clave para comprender la historia de estas viviendas y sus complejos valores patrimoniales. Entre sus hallazgos más relevantes destaca “[la] falta de estudios en la región sobre los sistemas constructivos tradicionales; tema no menor, pues insistimos en que el tipo de vivienda es un reflejo tangible del tipo de sociedad y cultura [...]” (Rodríguez Cano et al. 2021: 89).

La relevancia del tema y la drástica pérdida de este sistema constructivo tradicional hacen imperativo

profundizar en el registro, la identificación y el análisis de los saberes constructivos que sustentan la edificación, el mantenimiento y la continuidad de las casas de “techo de oreja” en la Mixteca Baja.

Gracias a la colaboración e interés de habitantes y maestros constructores del municipio de San Jerónimo Xayacatlán, durante los años 2024 y 2025, y por iniciativa del primer autor de este texto, se promovió el diseño y la construcción de una tercera casa de “techo de oreja” en la localidad de Santo Domingo Tonahuixtla, Puebla. Para la presente investigación, este hecho resultó crucial, pues permitió analizar su sistema constructivo desde un enfoque biocultural (Guerrero y Martínez 2022). Se prestó especial atención a los procedimientos y conocimientos tradicionales vinculados al uso sostenible de la biodiversidad y al “pensamiento filosófico” (UADY et al. 2024: 2) en torno a las casas de “techo de oreja” del pueblo Nuu’Davi.

Saberes constructivos tradicionales

La palabra “tradición” proviene del latín *traditio*, derivado de *tradere* (transmitir, entregar). En este sentido, la tradición designa aquello que se transmite de una generación a otra a lo largo del tiempo dentro de los grupos humanos (Diccionario Etimológico Castellano en Línea).

Para Herrejón (1994: 135), en la tradición “hay cinco elementos: 1) el sujeto que transmite o entrega; 2) la acción de transmitir o entregar; 3) el contenido de la transmisión, es decir, lo que se transmite o entrega; 4) el sujeto que recibe, y 5) la acción de recibir”.

En el caso de las viviendas de “techo de oreja”, su larga vigencia responde a un ciclo de recepción y transmisión cultural resultado de la valoración práctica que los pueblos Nguiva y Nuu’Davi han hecho de la adecuación de los sistemas constructivos a sus territorios y del aprovechamiento racional de los recursos naturales para adaptar los espacios habitables a las condiciones higrotérmicas regionales. Según el INEGI (2000), esta zona presenta un clima BS1(h’)w(w), con una temperatura media anual de 24.8 °C y una precipitación anual inferior a 1000 mm. Desafortunadamente, este ciclo se ha visto interrumpido drásticamente en menos de medio siglo, lo que ha afectado el desarrollo de esta tradición constructiva en el tiempo.

La tradición no es sólo la transmisión de formas de “ser y habitar” de una generación a la siguiente; en su sentido profundo constituye un proceso dinámico que actúa como puente hacia el futuro, lo que garantiza la permanencia de un grupo social o de una identidad colectiva a lo largo del tiempo. Más que limitarse a conservar de manera inalterada determinadas manifestaciones culturales, la

tradición interactúa, asimila, se adapta y evoluciona frente a nuevos contextos sin perder su esencia. Su propósito es prolongar indefinidamente una cultura, mediante la trascendencia de la existencia individual de los miembros de una comunidad. Como afirma Herrejón, “el sentido de la tradición está en la dimensión temporal de la cultura. La cultura no existe fuera del tiempo y, por eso mismo, la cultura no existe sin tradición” (1994: 140).

Por otra parte, dentro de la transmisión generacional de saberes, un aspecto clave –a menudo ignorado– radica en lo que se conoce como procesos quinesésicos. Con frecuencia se afirma que las tradiciones se transmiten de forma oral, dado que no existen textos que detallen las acciones implicadas en su ejecución. Sin embargo, procesos como los analizados en este estudio implican conocimientos de múltiples ámbitos, entre los cuales destaca la manera en que las personas emplean su cuerpo para edificar. Si bien es posible nombrar los componentes de estas construcciones, las fuentes de sus materias primas y las etapas constructivas, su articulación sólo cobra sentido en la práctica misma, donde intervienen todos los sentidos y el lenguaje resulta insuficiente para describir su compleja interacción. Como se ha demostrado científicamente en la última década, la memoria corporal (Pallasmaa 2012) es fundamental tanto para el funcionamiento individual como para la transmisión colectiva de una tradición.

El trabajo comunitario permite que sus integrantes interactúen a través de la acción misma, lo que favorece una experiencia integral. Desde las tareas básicas de mantenimiento hasta la construcción completa de una vivienda, estas prácticas se desarrollan principalmente mediante la acción compartida. Aunque se emplean palabras para nombrar componentes o técnicas, la transmisión del conocimiento ocurre, en su mayor parte, a través de la práctica. Como señala Pallasmaa (2012: 132): “En la colaboración que he mantenido con pintores, escultores y artesanos a lo largo de cuatro décadas, he aprendido a admirar su capacidad para captar las esencias de las cosas a través de sus manos y sus cuerpos, y a través de su entendimiento existencial no conceptualizado, más que a través de sus análisis intelectuales y verbales”.

A partir de estas consideraciones, la tipología arquitectónica de “techo de oreja”, como parte de una de las tradiciones culturales más antiguas de México, adquiere un valor patrimonial que trasciende lo regional para integrarse en el patrimonio nacional. Su proyección futura depende no sólo de conservar imágenes de sus restos o descripciones de sus procesos constructivos, sino también de su materialización.

Así, el patrimonio se sustenta en tradiciones tangibles e intangibles que, aunque suelen valorarse como bienes materiales, en realidad trascienden los objetos. El estudio del patrimonio arquitectónico no se limita a estos, sino

que abarca también los procesos sociales que hicieron posible su manifestación cultural a lo largo del tiempo. Se trata, por tanto, de una actividad colectiva que incluye al grupo que posee y transmite estos bienes, sus procesos de elaboración y sus sistemas de significado como herencia cultural.

En este sentido, la herencia cultural debe entenderse de manera integral y multidimensional, sin fragmentar su complejidad en patrimonio “tangible” o “intangible”, pues se trata de aspectos de una misma realidad que posee una dimensión temporal, una dimensión físico-material y una dimensión simbólica y de significado (Herrejón 2006: 6).

Para esta investigación, entendemos que la vivienda conocida como casa de “techo de oreja” debe valorarse como un patrimonio sustentado en la continuidad de las tradiciones de los pueblos Nguiva y Nuu’Davi. Esta herencia cultural posee una dimensión material, definida por su sistema constructivo y sus componentes, así como una dimensión simbólica, que integra el pensamiento filosófico y el sistema de saberes prácticos vinculados al proceso cultural de la vivienda.

Metodología

El objetivo de este trabajo fue documentar y registrar los procesos y técnicas tradicionales del sistema constructivo de la casa de “techo de oreja” mediante el método etnográfico de observación directa con participación activa (Hernández et al. 2014; Jociles 2018). La investigación se llevó a cabo en la comunidad de Santo Domingo Tonahuixtla, Puebla, en la Mixteca Baja, donde se realizaron visitas reiteradas para documentar la construcción de la vivienda, iniciada en marzo de 2024 y concluida en enero de 2025.

Para comprender en profundidad los procesos del sistema constructivo tradicional, resultó fundamental el uso del registro audiovisual como técnica de recolección de información durante toda la construcción. Posteriormente, el material grabado en este “espacio de aprendizaje” (UADY et al. 2024: 4) fue sometido a una observación diferida con el fin de sistematizar la información (Rojas y Mellado 2015).

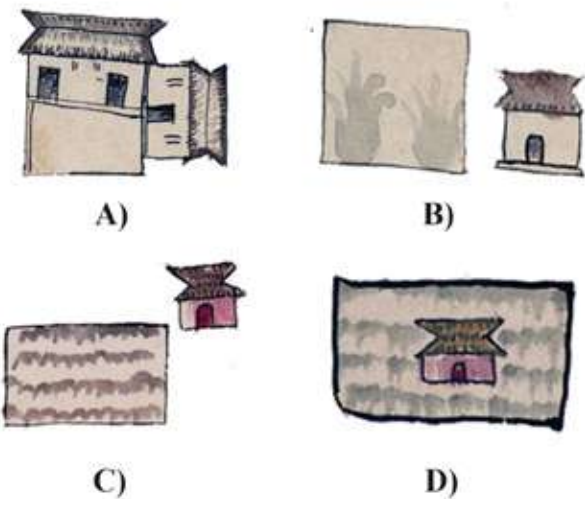
Esta investigación abordó la tipología arquitectónica de la casa de “techo de oreja” desde un enfoque biocultural (Boege 2021; 2024; Pirondo et al. 2023), para lo que se toma como referencia el marco conceptual del complejo *kosmos-corpus-praxis* (k-c-p) propuesto por la etnoecología. Este modelo permite analizar integralmente las tradiciones culturales como un sistema de conocimientos (*corpus*) y de creencias (*kosmos*), que adquiere sentido a través de las prácticas (*praxis*) (Toledo y Barrera-Bassols 2014: 111).

Edificios con salientes laterales en la cumbrera de los techos, identificados en mapas coloniales de la Mixteca Baja fechados entre los siglos XVI y XIX (Rodríguez Cano et al. 2021)

A) y B) Mapa de Tepexic de la Seda y sus alrededores

C) Mapa de Santa Clara y sus alrededores

D) Mapa de Santiago Tecali y sus alrededores



El estudio se inscribe en las dimensiones generales del complejo *kosmos-corpus-praxis* (k-c-p), adaptándolo al contexto específico de la región Ñuu'Davi. En este marco se abordaron tres dimensiones fundamentales: los procesos y procedimientos kinestésicos (*praxis*), entendidos como saberes constructivos tradicionales; el conocimiento ecológico tradicional sobre el uso sostenible de la biodiversidad (*corpus*); y el pensamiento filosófico asociado a las casas de “techo de oreja” (*kosmos*). Todos ellos fueron transmitidos en el espacio de aprendizaje desarrollado en Tonahuixtla, Puebla.

El sistema constructivo tradicional de la casa de “techo de oreja”

En diciembre de 2023 se realizaron las primeras entrevistas con dos maestros constructores de la región Ñuu'Davi, en el estado de Puebla: don Luciano Cruz, de 93 años, y don Tomás Velázquez, de 87. Ambos compartieron su experiencia en el tejido de casas de palma en la Mixteca Baja y coincidieron en que ambos son probablemente de los últimos habitantes que aún dominan los procedimientos tradicionales para edificar este tipo de vivienda en la región.

En colaboración con ellos se concretó la iniciativa de construir una casa de “techo de oreja”, con el propósito de registrar y documentar los saberes vinculados a su proceso constructivo. Se convocó a diversas personas a participar en un espacio de aprendizaje en el que se reactivó la transmisión de los conocimientos constructivos tradicionales relacionados con el uso de la biodiversidad local para la edificación de esta tipología de vivienda.

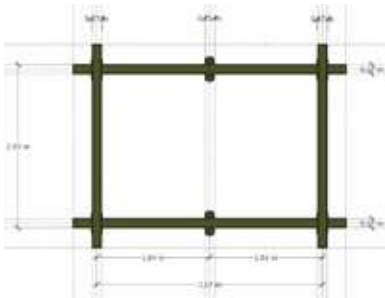
Los maestros constructores señalaron los elementos necesarios para levantar una casa y, una vez reunidos, con la colaboración de habitantes y participantes voluntarios, se inició en marzo de 2024 la construcción de la casa de “techo de oreja” en la comunidad de Tonahuixtla, Puebla, México.

Desarrollo del trabajo

Primero se elaboró una estructura de madera compuesta por horcones y soleras, base sobre la cual se colocaron las “tijeras” que conforman el armazón destinado al tejido del material vegetal de la cubierta. Se utilizaron maderas de *mezquite* y *zapote*, obtenidas en la misma localidad. En total se emplearon seis horcones de 3 m de longitud y 30 cm de diámetro, anclados directamente al suelo a una profundidad de 60 cm.

Para las soleras, llamadas *nuu du'cu* en mixteco –que significa “palo pescuezo”–, se emplearon dos piezas de madera de sauce (*Salix humboldtiana*) de 4.6 m de largo y 25 cm de diámetro, y otras dos de 3 m de largo con el mismo diámetro.

Una vez montada la estructura de horcones y soleras, se armaron tres “tijeras”, o *nuu chehle* en mixteco. Cada “tijera” consiste en un ensamble de cuatro ramas de sauce de 3 m de largo y 15 cm de diámetro. En cada rama se practicó un corte longitudinal de 50 cm para bifurcarla, y luego se trabaron formando un ángulo agudo, con las puntas de las bifurcaciones sobresaliendo 10 cm.

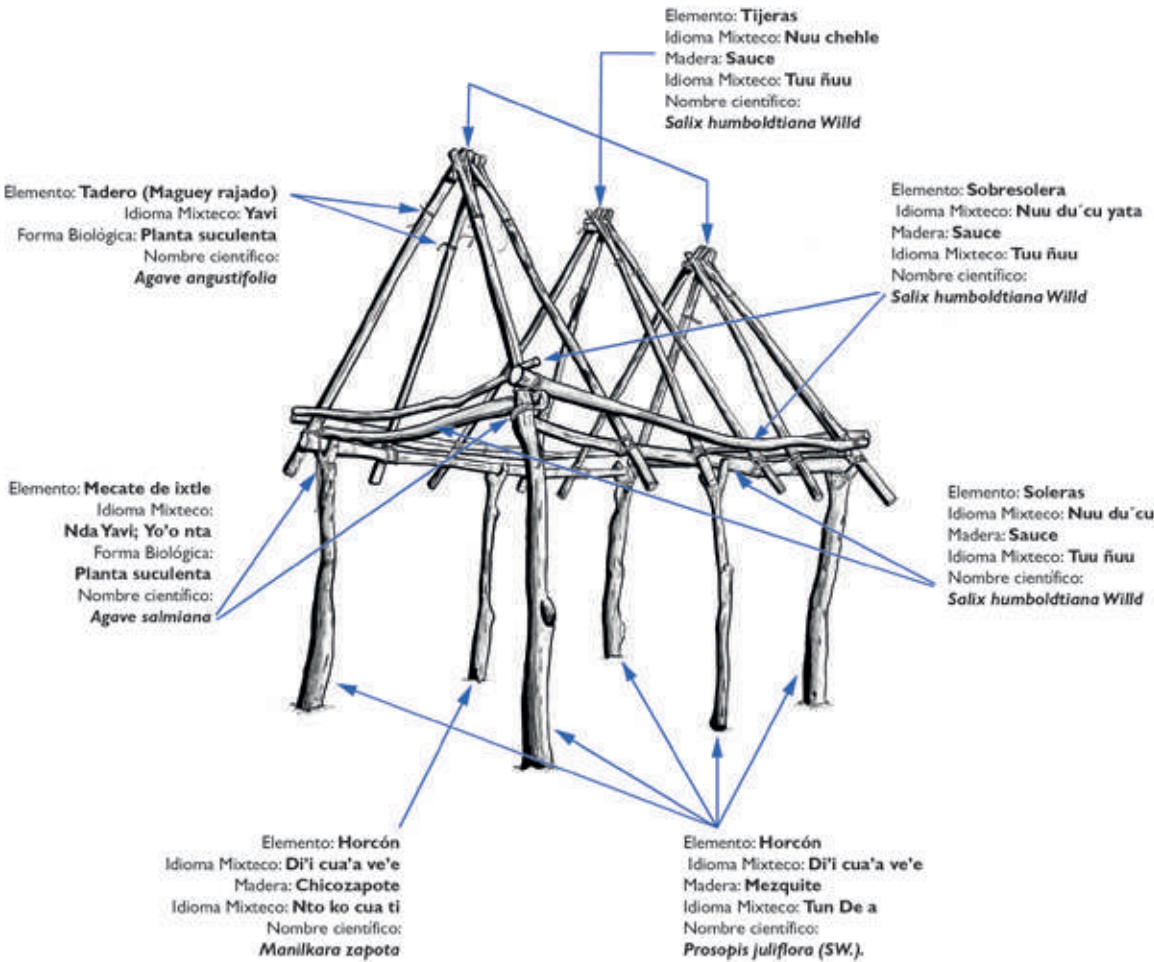


Vista en planta de la estructura con horcones y soleras (Paulina Monroy)

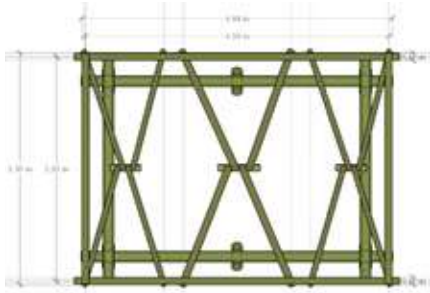
< Vista de la estructura con horcones y uso de carrizos para medir la longitud de las “tijeras”



1. Ensamble de ramas de sauce que forman una “tijera”, atadas con ixtle.
2. Vista del ángulo interno del ensamble de una “tijera”.
3. Amarre que fija la intersección entre horcón, soleras y “tijeras”.
4. Detalle del amarre de la “tijera” a la solera.



Dibujo de la estructura de madera con sus elementos principales: horcones, soleras, “tijeras” y sobresoleras



Vista en planta de la estructura de las “tijeras” (Paulina Monroy)

< “Tijeras” montadas sobre las soleras, que constituyen la base de la estructura de la cubierta



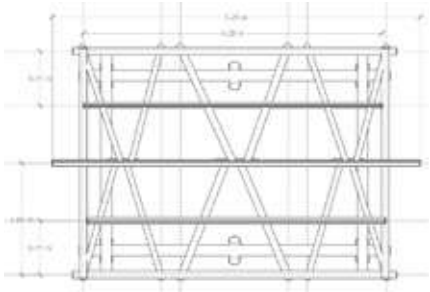
< Amarre de las sobresoleras a las “tijeras” con mecate de ixtle

Se colocaron dos pares de maderas ensambladas, uno sobre otro, en la misma posición. En los ángulos agudos de ambos ensambles se insertó una sección delgada de madera que sobresalía 10 cm a cada lado. Finalmente, toda la estructura se amarró y apretó con *mecate de ixtle*, lo que aseguró la unión de los ensambles con la sección interna del tronco. Este procedimiento da como resultado una “tijera”. Una vez armadas las tres “tijeras” para la cubierta, se montaron y amarraron sobre las soleras longitudinales, para lo que se aseguró todas las piezas con *mecate de ixtle*.

Las sobresoleras, o *nuu du’cu yata* en mixteco, son ramas de sauce de igual longitud y diámetro que las soleras (dos de 4.6 m de largo y 25 cm de diámetro, y otras dos de 3 m de largo y 25 cm de diámetro). Se colocaron sobre las “tijeras” para sostener un entramado de carrizo, sobre el cual se tejó la palma que cubre la estructura y conforma el techo de la casa.

Durante la elaboración de la estructura se revitalizaron los conocimientos y experiencias previas de los participantes sobre las técnicas y procedimientos necesarios, pues hacía años que no se construía una vivienda de este tipo en la localidad. Los maestros constructores comentaron que “así lo hacía la gente grande”, es decir, quienes vivían de acuerdo con las formas tradicionales de habitar el territorio. Esta se puede considerar por tanto la vivienda más propia y antigua de la región Ñuu’Davi.

La lógica constructiva de la estructura de madera encierra un conocimiento biocultural que integra la comprensión del ecosistema de la Mixteca poblana con los saberes tradicionales de maestros y habitantes. Estos conocen las cualidades de cada madera, la ubicación de los árboles, los tiempos idóneos para su corte, su acondicionamiento y su aplicación en la construcción.

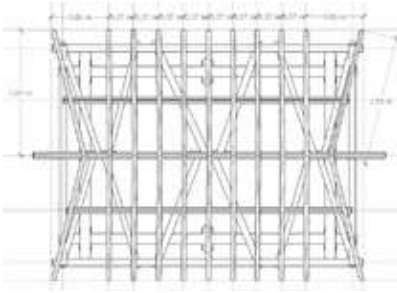


Vista en planta de los rollos de carrizo laterales *n’chii ik’a ve’e* y del rollo de carrizo en la cumbrera, denominado *nu’u yoo dihiní* (Paulina Monroy)

> Rollos laterales de carrizo *n’chii ik’a ve’e* y rollo de la cumbrera denominado *nu’u yoo dihiní*



> Doblado de carrizos en la cabeza de la casa para formar el entramado vertical



Vista en planta de la estructura de la casa con el entramado vertical *nu’u yoo iki* (Paulina Monroy)

> Vista de la estructura de la casa con el entramado vertical *nu’u yoo iki*

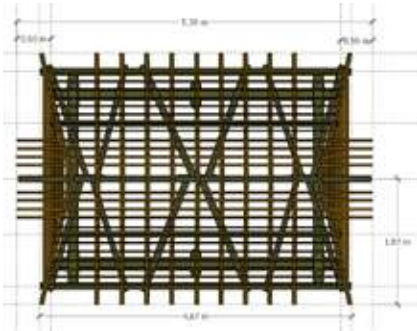


Posteriormente, sobre el rollo de carrizo de la cumbrera se doblaron pares de carrizos cada 20 cm, con una longitud aproximada de 5 m. El doblez se hizo a la mitad, cuidando no fracturar el *mboó* (entrenudo). Se colocaron once pares, alternando punta y base, y se amarraron a los rollos

laterales y a las sobresoleras, formando un entramado vertical inclinado llamado *nu'u yoo iki* (carrizo doblado). En los gabletes de la casa se colocaron dos maderas en forma de cruz. La horqueta en la cúspide se insertó en



< Entramado de la “oreja” de la casa y cruz de carrizo sobre el gablete



Planta de la estructura y del entramado de carrizos del techo (Paulina Monroy)

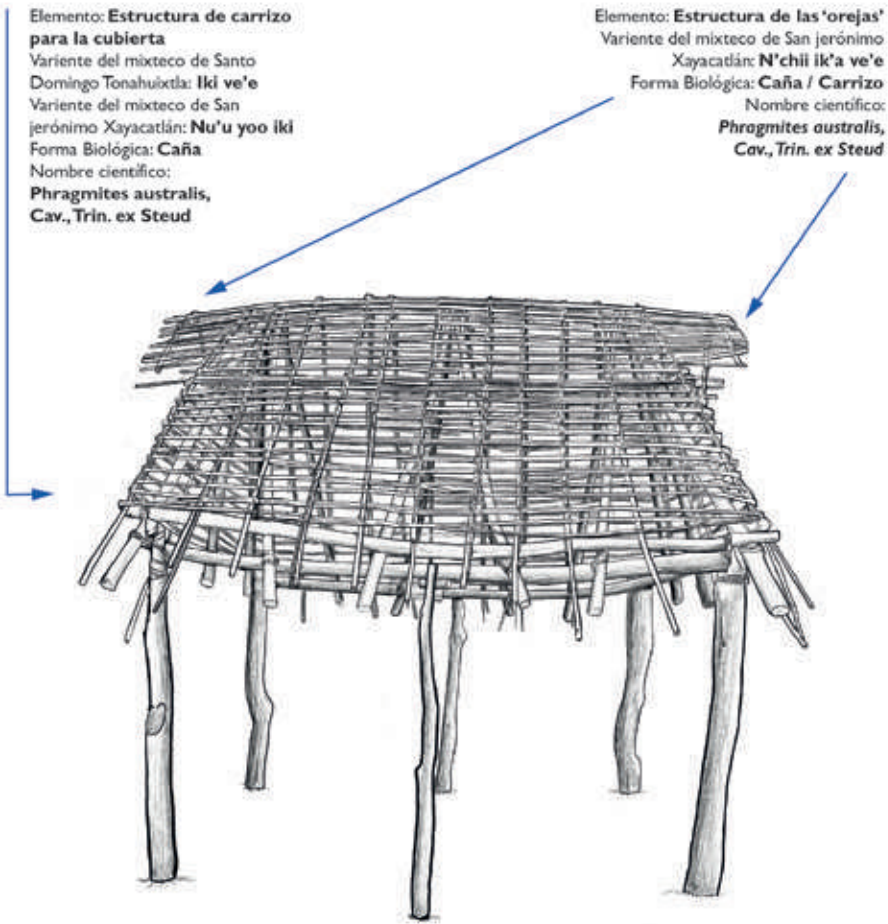
< Amarre del entramado de carrizo con fibras rajadas de *maguey*



Maestro rajando *maguey* o *yavi*



Uso del *yavi* como “tadero” para amarrar los carrizos



Dibujo de la estructura y el entramado de carrizo de la cubierta

la sección de madera que sobresalía del ángulo interno de las “tijeras”. Los brazos de la cruz descansaban sobre las partes salientes de los rollos de carrizo previamente amarrados a las “tijeras”, y su base se fijó entre la solera

y la sobresolera. Simultáneamente, se amarraron ocho carrizos horizontales, del mismo largo que el carrizo cabezal, desde la cumbrera hasta el pecho de la casa, con una separación de 15 cm entre ellos. Las ataduras



1

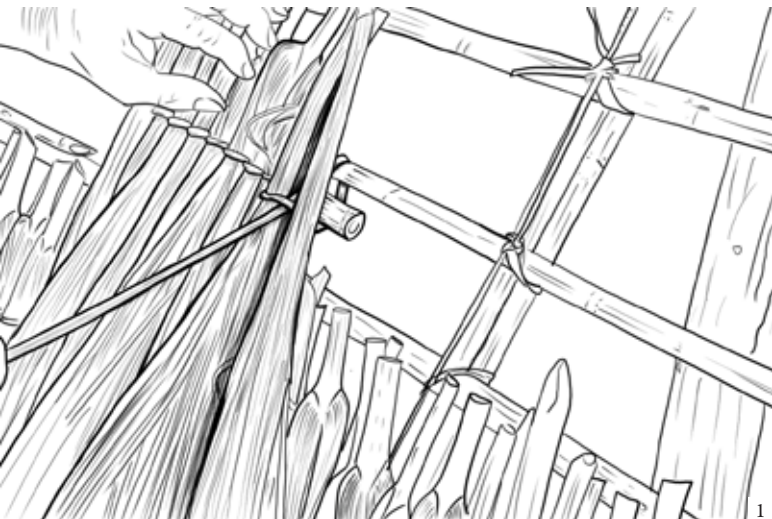


2



3

1. Rajado de hojas de palma
2. Elaboración de rollos de palma
3. Colocación de los rollos de palma en el borde del entramado



1. Apretado del nudo que fija la palma al entramado
2. Vista superior del tejido de palma
3. Maestro constructor teje la palma sobre la cubierta

se realizaron en las intersecciones del entramado. Este conformó la base de las “orejas” de la casa. En ambos gabletes se colocó una cruz de carrizos doblados, amarrada al entramado vertical y a la sobresolera. En la intersección se suspendió un carrizo doblado, también atado a la sobresolera.

Para unir los carrizos entre sí se emplearon fibras frescas de *maguey* (*Agave angustifolia*). Los maestros constructores llamaban *tadero* a estas fibras rajadas, posiblemente como contracción de la palabra “atadero”. En idioma mixteco, el *maguey* se denomina *yavi*.

El amarre del entramado de carrizos, desde el pecho de la casa hasta las sobresoleras, se realizó doblando y uniendo horizontalmente los carrizos al entramado vertical, de modo que formaran anillos que sirvieron de base para los planos inclinados de la vivienda. Para conformar cada anillo horizontal del entramado se utilizaron dos carrizos largos, amarrados punta con tronco en el gablete. Al rodear con carrizo toda la estructura de la cubierta esta adquirió la forma de una canasta.

En los lados longitudinales del entramado de la cubierta se colocaron 22 carrizos horizontales por lado, separados 15 cm. En los lados transversales se dispusieron 17 carrizos horizontales, desde el travesaño de la cruz de madera en el gablete hasta la sobresolera. La cantidad de carrizos varía según el tamaño de la vivienda. Una vez concluido el entramado recibe el nombre de *Iki ve’e*. En este caso sirvió como soporte para tejer la palma de la cubierta.

Para tejer el techo se utilizó palma (*Brahea dulcis*), previamente secada durante unas dos semanas. Luego se acondicionó cortando las espinas, para lo que se redujo el



tallo a 10 cm y se rajaron las hojas longitudinalmente por la mitad. Una vez acondicionadas, el maestro formó rollos con seis palmas, que amarró en los bordes del entramado. Estos rollos impiden el paso de agua en las uniones de los planos inclinados del techo.

Los rollos se colocaron en los bordes a medida que avanzaba el tejido horizontal sobre el entramado de carrizo. En esta vivienda el amarre de palma para conformar la cubierta comenzó en el quinto carrizo, de abajo hacia arriba, en un lado longitudinal desde el extremo izquierdo. Cada carrizo tejido con palma se denomina “surco”, y el tejido se realizó alternando un carrizo sí y otro no, hasta llegar al caballete. Para amarrar la palma al entramado se utilizaron *taderos* de *maguey*.

El amarre de palma, una de las actividades más laboriosas, se realizó de manera colectiva. El maestro transmitió a los participantes la técnica de amarre con *tadero* de *maguey*. El proceso comenzó por los lados longitudinales del techo y continuó después en los lados transversales, o “culatas”.

En los lados longitudinales del techo se amarraron once “surcos” de palma hasta la cabeza de la casa, incluidas las “orejas”. Un aspecto relevante del conocimiento tradicional Ñuu’Davi es que el total de “surcos” debe ser impar. Según esta cosmovisión, si el número es par, alguien involucrado en la obra o cercano corre riesgo de muerte. Por ello, antes de iniciar el tejido se contaron los “surcos” para garantizar que el número fuera impar.



Para amarrar la palma se instalaron cuarterones de madera horizontales sobre los planos inclinados longitudinales, que sirvieron de apoyo para alcanzar la cumbrera. El tejido de palma sobre el entramado de carrizo requirió cerca de cuatro días para cubrir los planos inclinados. Los últimos “surcos” fueron tejidos exclusivamente por los maestros y los colaboradores con mayor experiencia.

Tras finalizar el tejido de palma, se elaboró el *Dini’á* (“lomo” de la casa en mixteco), que consiste en colocar y amarrar hojas de palma horizontalmente sobre la cumbrera, cubriendo la unión de los planos inclinados sobre el rollo de carrizo cabezal. Para ello se empalmaron y amarraron dos carrizos, a fin de alcanzar la longitud necesaria, que sirvieron de soporte para el *mecate* con el que se sujetó la palma. Estos carrizos se ubicaron 20 cm por debajo de los tallos de palma del último “surco” en cada lado de las pendientes. El amarre se realizó con aguja de *otate* y *mecate* de *ixtle*.

El uso de la aguja de *otate* requirió la colaboración de dos personas para amarrar los carrizos entre sí, para lo que se utilizó *mecate* de *ixtle* o *tadero* de *maguey* en la parte



1. Elementos de la cabeza del “techo de oreja”
2. Uso de la herramienta “aguja”, elaborada con una vara de *otate* (*Otatea acuminata*)
3. Palmas torcidas y sujetas entre los carrizos dispuestos junto al “lomo”.
4. Elaboración del caballete con palma torcida.
5. El “chapulín” se aprieta mediante golpes

inferior y superior del techo. Una persona insertaba la aguja desde abajo, mientras la otra efectuaba el amarre desde arriba. De este modo se aseguraron los carrizos que sostuvieron el “lomo” y el caballete de la casa.

Sobre el “lomo” se construyó el caballete, elaborado con palma blanca (*Sabal mexicana*), también utilizada regionalmente para la fabricación de sombreros. Se colocaron dos pares de carrizos en cada pendiente, junto a los que sostenían el “lomo”. Para su fijación se empleó igualmente la aguja de *otate*. Tras amarrar dos pares de carrizos a cada lado del “lomo”, se dispuso un carrizo central, del largo de la cabeza de la casa, al que se atravesó un palito para formar una cruceta en cada extremo. Tanto el carrizo con crucetas como los pares de carrizos colocados a los costados del “lomo” tuvieron la función de sostener la palma blanca utilizada en la construcción del caballete.

El proceso de construcción del caballete, denominado también “chapulín”, representó un desafío para la conclusión del “techo de oreja” de esta vivienda. El maestro comentó que, tradicionalmente, este trabajo estaba a cargo de especialistas, ya desaparecidos en la Mixteca Baja. Él no había participado antes en este acabado, pero, tras haber observado a los antiguos maestros y hacer memoria, logró reconstruir el

procedimiento. El “chapulín” constituyó la última etapa del techo: una cubierta de palmas montadas en el carrizo con crucetas, torcidas en dos cabos hacia ambos lados de los planos inclinados. Un cabo se aseguraba entre los pares de carrizos junto al “lomo” y el otro quedaba sobre ellos. De esta manera se cubrió completamente el “lomo”, lo que evitó además la filtración de lluvia por la cumbrera.

Para finalizar, se golpearon la parte superior de los tallos de palma y los costados del “chapulín” con palos, lo que dio rigidez y uniformidad al torcido de las palmas. En caso de quedar huecos entre los tallos, estos se rellenaron y ajustaron mediante la inserción de palmas adicionales. Una vez terminado el “chapulín”, se recortaron las puntas de las palmas que sobresalían en exceso en los aleros.

A partir de un encofrado se desplantó un cimientado de 30 cm de altura, construido con piedra y mortero de lodo, y acabado con piedra laja. Este sirvió como base para el entramado de carrizo (*bajareque*) con el que se levantaron los muros de la vivienda. Las piedras utilizadas fueron de río, conocidas en la variante mixteca de Tonahuixtla como *Yuu Yo'te*, y la piedra laja como *Yuu Paala*. Los cimientados o los muros de mampostería reciben el nombre de *Nhama*.

Una vez concluidos los cimientados, se inició el entramado de carrizo, conocido en mixteco como *Sa'a Ve'e* (“pie de casa”). El maestro a cargo colocó varillas a plomo, insertadas en los entrenudos de carrizo embebidos en los cimientados, que sirvieron como guías para elaborar el entramado, también llamado *chiname*. A estas varillas se

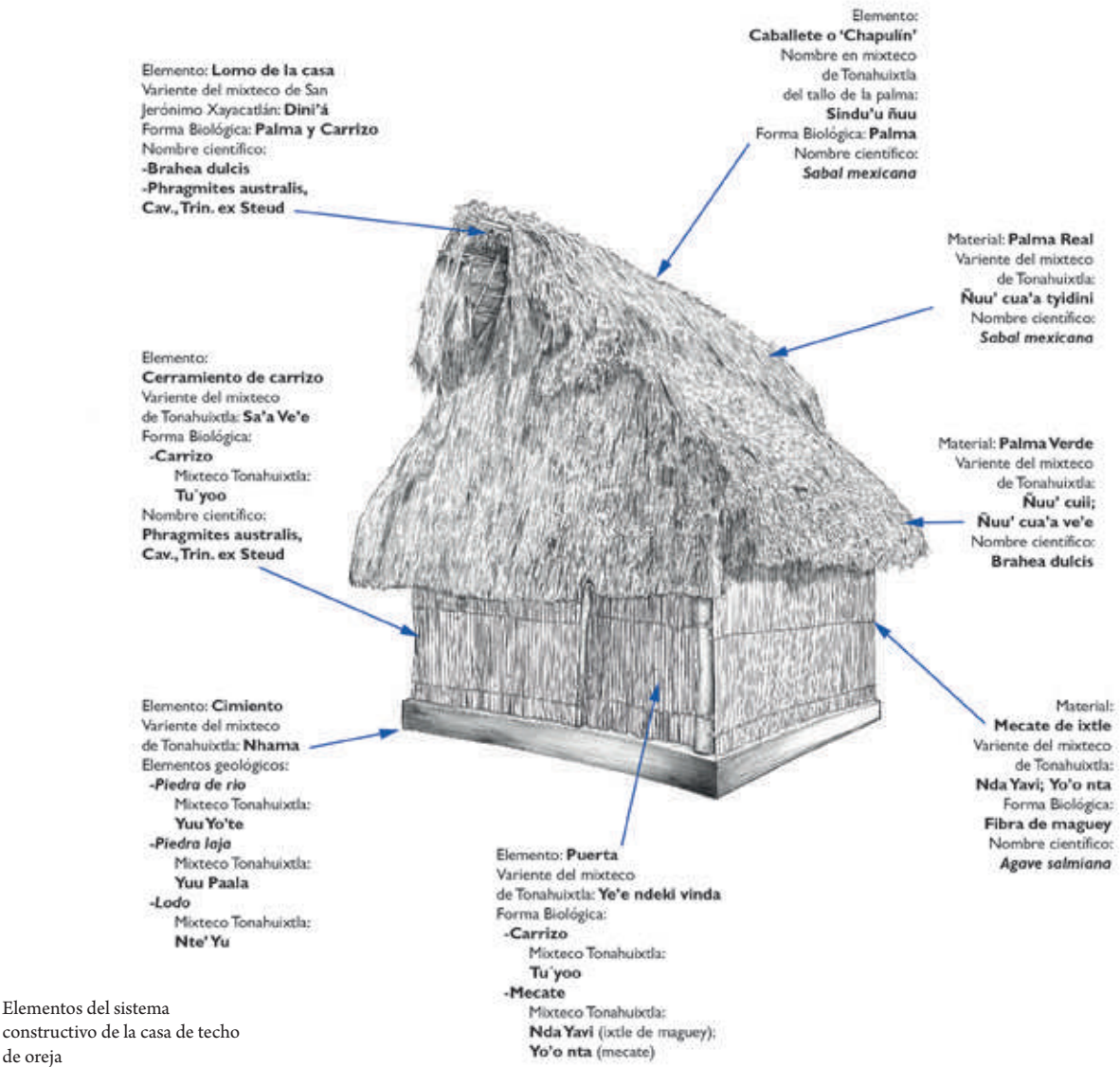
sujetaron tres carrizos guía en posición horizontal, sobre los cuales se amarró verticalmente el resto del entramado.

Para elaborar el entramado los carrizos se cortaron a 170 cm de longitud. El amarre se efectuó con *mecate de ixtle*, mediante la unión de forma continua de pares de carrizos dispuestos punta con tronco a los tres carrizos guía horizontales. Este procedimiento se repitió hasta cerrar los cuatro lados de la vivienda, para lo que se dejó en uno de los lados transversales un espacio de 1 metro destinado a la puerta.

Posteriormente se elaboró la puerta de la vivienda. Para conservar su flexibilidad, se omitieron los carrizos horizontales en el entramado. Los carrizos se dispusieron en posición vertical sobre una tabla y se amarraron de forma continua en tres puntos: a 25 cm de cada extremo y en el centro de su longitud. Al finalizar la puerta, se sujetó con tres amarres de *mecate* a un horcón de la casa y se elaboró una gaza que permite cerrarla al atorarla en un par de carrizos del entramado del muro.

Con los procedimientos descritos en esta sección se concluyó la documentación del sistema constructivo de la casa de “techo de oreja” en la comunidad de Santo Domingo Tonahuixtla, Puebla, México, en enero de 2025.

1. Encofrado del cimientado
2. Amarre del entramado de carrizo con *ixtle*
3. Proceso del entramado, con una madera entre los horcones que actúa como poste para sostener la puerta.
4. Amarre de la puerta con *mecate* en uno de los extremos de los carrizos.



Conclusión

Mediante la creación de un espacio de aprendizaje colaborativo se llevó a cabo la construcción de una vivienda tradicional de “techo de oreja”, lo que permitió reactivar, aunque de manera temporal, la transmisión de los saberes constructivos ancestrales. Esta tipología arquitectónica constituye una manifestación de la herencia biocultural de la región Nuu'Davi, en la Mixteca Baja de Puebla. Su análisis, en el marco de los estudios bioculturales aplicados a la arquitectura, puede abordarse a partir de la articulación y comprensión de las categorías patrimoniales material, natural e inmaterial.

En este sentido, durante el desarrollo de la investigación se logró registrar y documentar el sistema constructivo tradicional de la casa de “techo de oreja”, lo que refleja la dimensión material (tangible) de esta herencia. Se identificaron las partes que la componen –estructura de

madera, techumbre, cimientado y cerramiento–, así como cada uno de los elementos que a su vez integran dichas partes.

En cuanto a su relación con la dimensión del patrimonio natural, resulta indudable que esta tipología de vivienda se configura a partir de los bienes naturales característicos de la región, con una lógica constructiva estrechamente vinculada a la diversidad biológica y geológica del ecosistema local de la Mixteca poblana.

La dimensión inmaterial (intangible) de la casa de “techo de oreja” se manifiesta en la articulación del pensamiento filosófico del pueblo Nuu'Davi con los conocimientos ecológicos y los saberes constructivos tradicionales que configuran el habitar de su territorio a través de las prácticas culturales. Incluye el cómo, cuándo, dónde y por qué de los procedimientos tácitos que, transmitidos de manera intergeneracional, se rigen por ciclos lunares,

temporadas del año y días considerados propicios para realizar ciertas acciones, como la recolección de los bienes naturales.

Esa herencia cultural inmaterial orienta cada etapa del proceso constructivo de la casa de “techo de oreja”, cuya materialización puede comprenderse desde las tres dimensiones del saber Nñu’Davi: la cosmogónica, la ecológico-ambiental y la práctica (*complejo k-c-p*), todas ellas indispensables para edificar una vivienda tradicional mixteca. La experimentación de los saberes constructivos tradicionales fue posible gracias a que los maestros constructores aún conservan el pensamiento filosófico de la ayuda mutua y transmitieron sus conocimientos bajo estos principios.

El proceso de transmisión se comprendió a partir del ciclo de la tradición propuesto por Herrejón (1994). En este caso, los maestros, junto con algunos participantes locales, transmitieron sus conocimientos mediante la práctica directa y la ejemplificación. Los contenidos transmitidos incluyeron técnicas tradicionales esenciales para la construcción de la casa de “techo de oreja”, como: 1) trabajo artesanal de la madera; 2) entramado de carrizo para la techumbre; 3) amarres y nudos de sujeción; 4) tejido de palma para la cubierta; 5) uso de aguja de *otate*; 6) “lomo” de la casa; 7) caballete y “orejas” de la casa; 8) cimientto con piedras y mortero de tierra; y 9) entramado de carrizo para el cerramiento. Los receptores –participantes locales, voluntarios y el investigador– interiorizaron estos saberes por medio de la observación, la práctica y el ensayo-error, lo que les permitió adaptarlos y, eventualmente, convertirse en portadores capaces de reproducir y transmitir nuevamente este conocimiento.

Es evidente que estos saberes permanecen vivos en los habitantes de mayor edad, pero el sistema constructivo tradicional de “techo de oreja” sigue en grave riesgo de desaparecer si no se reactiva y transmite de manera constante dentro de la propia comunidad. Por tanto, se espera que este artículo contribuya al campo de la arquitectura tradicional vernácula de los pueblos originarios Nñu’Davi, al llenar un vacío teórico en los estudios pioneros sobre una tipología habitacional prehispánica cuyos procedimientos constructivos permanecían prácticamente olvidados.

Además, persisten ámbitos que no se exploraron de manera exhaustiva en este estudio y cuya profundización resulta indispensable en investigaciones futuras, con el propósito de evitar la desaparición de esta tipología constructiva. Su desarrollo permitirá mantener vigente este y otros sistemas constructivos tradicionales de la región, favorecer su reintegración al ciclo de la tradición y fortalecer la debilitada cultura constructiva de la Mixteca Baja de Puebla en beneficio de sus comunidades. Entre ellos se encuentran, por ejemplo, proyectos transdisciplinarios que atiendan no solo la actualización

del sistema constructivo, sino también la regeneración integral del ecosistema y del hábitat Nñu’Davi. Asimismo, el registro audiovisual realizado en estas comunidades requiere un proceso de postproducción que dé lugar a un documental capaz de difundir el conocimiento de este sistema constructivo.

En conjunto, este esfuerzo busca que las comunidades reconozcan y valoren su herencia, y que ello contribuya al buen vivir y a la sostenibilidad de los pueblos originarios de México.

References | Referencias | Referências

Boege, Eckart (coord.). 2024. *Etnografía del patrimonio biocultural de las regiones y territorios indígenas de México. Vol. II. Regiones bioculturales del Centro y Occidente de México*. Ciudad de México: Secretaría de Cultura, INAH. <https://www.aacademica.org/eckart.boege/S1>

Boege, Eckart. 2021. *Acerca del concepto de diversidad y patrimonio biocultural de los pueblos originarios y comunidad equiparable: Construyendo territorios de vida con autonomía y libre determinación*. Puebla: Benemérita Universidad Autónoma de Puebla.

Chadwick, Robert; y MacNeish, Richard. 1967. Codex Borgia and the Venta Salada Phase. En Byers, Douglas S. (ed.), *The Prehistory of the Tehuacan Valley*, 114-131. Austin: University of Texas Press.

Cook de Leonard, Carmen. 1953. Los Popolocas de Puebla. En Bernal, Ignacio; y Davalos Hurtado, Eusebio (eds.), *Huastecos, Totonacos y sus vecinos*, 423-445. Ciudad de México: Revista Mexicana de Estudios Antropológicos, Sociedad Mexicana de Antropología.

Cruz, Óscar; Salazar, Bertha; y Guerrero, Luis. 2024. Sistemas constructivos tradicionales del patrimonio biocultural de la Mixteca Poblana, México. *Journal of Traditional Building, Architecture and Urbanism*, 5: 387-403. <https://doi.org/10.51303/jtbau.vi5.772>

Guerrero, Luis; y Martínez, Maridel. 2022. Patrimonio biocultural y conservación sostenible. *Revista Americana de Urbanismo y Medio Ambiente para Juristas y Técnicos*, 8: 61-101. <https://www.rdu.es/articulos/revista/RADU-PAPEL>

Hernández, Roberto; Fernández, Carlos; y Baptista, Pilar. 2014. *Metodología de la investigación*. Naucalpan de Juárez: McGraw Hill Education.

Herrejón Peredo, Carlos. 1994. Tradición Esbozo de algunos conceptos. *Relaciones. Estudios de historia y sociedad*.

Herrejón Peredo, Carlos. 2006. Patrimonio Cultural. En *Primer Congreso Estatal de Cultura: Legislación y Políticas Culturales*.

INEGI. 2000. *Síntesis geográfica del estado de Puebla*. Ciudad de México: Instituto Nacional de Estadística, Geografía e Informática.

Jociles Rubio, María Isabel. 2018. La observación participante en el estudio etnográfico de las prácticas sociales. *Revista Colombiana De Antropología*, 54, 1: 121–150. <https://doi.org/10.22380/2539472X.386>

Lind, Michael. 2008. Arqueología Mixteca. *Desacatos*, 27: 13-32.

Pallasmaa, Juhani. 2012. *La mano que piensa. Sabiduría existencial y corporal en la arquitectura*. Barcelona: Gustavo Gili.

Rodríguez Cano, Laura; Rosas Salinas, Rodolfo; y Pantaleón Calixto, Alejandro. 2021. *La vivienda tradicional de la Mixteca poblana. Las últimas casas de techo de oreja de San Jerónimo Xayacatlán, Puebla*. Ciudad de México: Secretaría de Cultura.

Rojas Bahamonde, Pablo; Mellado, María; y Morales García, Camila. 2015. La cámara en el trabajo de campo: usos metodológicos y éticos del registro audiovisual en el mundo mapuche cordillerano. *Revista Chilena de Antropología Visual*, 26: 138-156.

Toledo, Víctor; y Barrera-Bassols, Narciso. 2014. *La memoria biocultural: La importancia ecológica de las sabidurías tradicionales*. Popayán: Universidad del Cauca.

UADY; UNAM; UAM; INAH; Cooperación Comunitaria; ENAH; y UG. 2024. Carta sobre el Pensamiento Filosófico en el “Patrimonio” Cultural. https://icich.icomos.org/wp-content/uploads/2024/10/ Carta_Pensamiento_en_el_Patrimonio.pdf (consultado el 03/03/2025)

Biographies | Biografías | Biografias

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Bonu Azizova

Tegizamin: The Invisible Engineering of Ichan-kala, Khiva

Tegizamin: La ingeniería invisible de Ichan-kala, Jiva

Tegizamin: A engenharia invisível de Ichan-kala, Khiva

Keywords | Palabras clave | Palavras chave

Underground cisterns, Vernacular infrastructure, Water heritage, Urban hydrology, Islamic architecture

Cisternas subterráneas, Infraestructura vernácula, Patrimonio hidráulico, Hidrología urbana, Arquitectura islámica

Cisternas subterráneas, Infraestrutura vernácula, Património hídrico, Hidrologia urbana, Arquitetura islâmica

Abstract | Resumen | Resumo

Khiva, a UNESCO World Heritage city, is widely known for its monumental architecture, but beneath its iconic madrasahs and minarets lies a lesser-known legacy: an intricate underground water infrastructure based on cisterns known as *tegizamins*. This article investigates the historical logic and material construction of Khiva’s traditional buried cistern systems, essential for drainage, rainwater harvesting, and potable water storage from the eighteenth to the twentieth centuries, together with proposed pathways for studying and reviving them. The *tegizamin*, in conjunction with drainage elements such as those known as *gulbidav* and *adan*, exemplifies how Khivan builders developed climate-adaptive and circular water infrastructure using regionally available materials and passive engineering. The rediscovery of several cisterns during infrastructure works in recent decades has sparked renewed interest in their conservation. This in turn contributes to broader discussions on vernacular engineering, heritage-based sustainability, and the recovery of embedded environmental knowledge for contemporary urban resilience. Through archival manuscripts, historical cartography, and comparative analysis of Central Asian water systems, we reconstruct the *tegizamin*’s layered typology and hydraulic functions, proposing a methodological framework for stratigraphic investigation, material sampling, and non-invasive geophysical surveying to map Khiva’s buried cistern networks.

Jiva, ciudad histórica que forma parte del Patrimonio de la Humanidad de la UNESCO, es famosa por su arquitectura monumental. Sin embargo, más allá de sus icónicas madrasas y alminares, hay un patrimonio menos conocido: una compleja infraestructura de aguas subterráneas denominada *tegizamin*. Este artículo investiga la lógica histórica, la construcción y las vías propuestas para estudiar y rehabilitar los sistemas tradicionales de cisternas subterráneas de Jiva, estructuras esenciales para el desagüe, la recogida de agua de lluvia y el almacenamiento de agua potable entre los siglos XVIII y XX. El *tegizamin*, junto con elementos internos de desagüe como el *gulbidav* y el *adan*, son un ejemplo de cómo los constructores locales

desarrollaron infraestructuras hidráulicas circulares y adaptadas al clima mediante el uso de materiales locales y de estrategias de ingeniería pasiva. El redescubrimiento de varias cisternas durante las obras de infraestructura realizadas en las últimas décadas ha suscitado un interés renovado en su conservación. Dicho interés contribuye a ampliar el debate sobre la ingeniería vernácula, la sostenibilidad basada en el patrimonio y la recuperación los conocimientos medioambientales arraigados para la resiliencia urbana contemporánea. A partir de los manuscritos encontrados en archivos, la cartografía histórica y un análisis comparado de los sistemas de abastecimiento de agua en Asia Central, el estudio reconstruye las tipologías estratificadas y las funciones hidráulicas del *tegizamin*. Sin haber realizado una excavación arqueológica propiamente dicha, este estudio propone un marco metodológico para la investigación estratigráfica, el muestreo de materiales y el sondeo geofísico no invasivo con el fin de cartografiar las redes de cisternas subterráneas de Jiva.

Khiva, uma cidade Património Mundial da UNESCO, é amplamente conhecida pela sua arquitetura monumental, mas por baixo das suas icónicas madrasas e minaretes existe um legado menos conhecido: uma complexa infraestrutura subterrânea de água baseada em cisternas conhecidas como *tegizamins*. Este artigo investiga a lógica histórica e a construção material dos sistemas tradicionais de cisternas subterráneas de Khiva, essenciais para a drenagem, captação de água da chuva e armazenamento de água potável entre os séculos XVIII e XX, juntamente com propostas para estudá-los e revitalizá-los. O *tegizamin*, em conjunto com elementos de drenagem como os conhecidos como *gulbidav* e *adan*, exemplifica como os construtores de Khiva desenvolveram infraestruturas hídricas circulares e adaptadas ao clima, utilizando materiais disponíveis na região e engenharia passiva. A redescoberta de várias cisternas durante obras de infraestrutura nas últimas décadas despertou um interesse renovado na sua conservação. Isto, por sua vez, contribui para discussões mais amplas sobre engenharia vernácula, sustentabilidade baseada no património e a recuperação de conhecimentos ambientais intrínsecos para a resiliência urbana contemporânea. Através de manuscritos de arquivo, cartografia histórica e análise comparativa dos sistemas hídricos da Ásia Central, reconstruímos a tipologia estratificada e as funções hidráulicas do tegizamin, propondo um quadro metodológico para investigação estratigráfica, amostragem de materiais e levantamentos geofísicos não invasivos para mapear as redes de cisternas enterradas de Khiva.

Introduction

Historic cities in Central Asia often invoke images of mosques and palaces, but Khiva in Uzbekistan is equally notable for its underground water infrastructure. Over centuries, the city relied on wells, cisterns, and irrigation canals for hygiene and resilience in an arid climate. Its technically accomplished hydraulic systems also supported social organization and political stability in the Khiva khanate, where water scarcity influenced daily life and governance. Khiva’s waterworks deserve recognition alongside the town’s monumental architecture, as the hidden key to its urban survival (Bichsel 2021).

Khiva’s architectural heritage, and particularly its underground water systems and construction techniques, remains underexplored compared to that of nearby historic cities such as Bukhara, Samarkand, and Kokand (Ahmedov 1995). Like these and other Silk Road towns, Khiva emerged at a junction of transcontinental trade routes (Allaeva 2019), serving as a hub for merchants and caravans (Khaitov and Aminova 2022). Yet it stands on relatively elevated and arid terrain, requiring creative and climate-adaptive water retention and sanitation solutions.

As Ahmedov (1995: 89-91) notes, the scarcity of surface water in the Khorezm region led Khivan builders to develop subterranean technologies integrated into domestic, religious, and urban architecture. According to the historian Komiljon Khudayberdiganov, the higher central part of Khiva—Ichan-kala—was built using red sand

brought from afar, whose properties of neither absorbing water nor allowing it easily to percolate gave rise to several types of underground water structure. A prime example are cistern systems such as the *tegizamin*, which provided passive, decentralized water management throughout the city, collecting both wastewater and rainwater.



Figure 1: Craftsman and architect Abdulla Boltaev (Boltaev 2013)

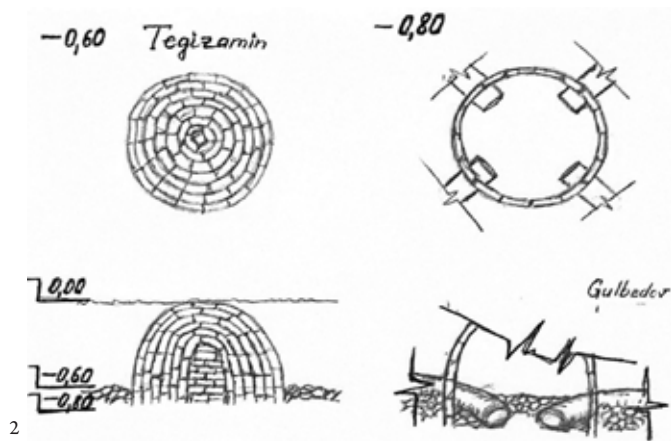


Figure 2: Schematic view of a tegizamin and gulbidav
Figure 3: Dishan-kala (indicated in white) and Ichan-kala (in yellow) in Khiva (Google maps)

Despite their historical significance, Khiva's traditional hydraulic networks were neglected by the townspeople and largely destroyed during the Soviet era. Centralized planning resulted in widespread encroachment, abandonment, or destruction (Durdieva 2012). According to Ahmedov (1995), traditional engineering methods were

disregarded in urban development after the 1930s, resulting in a loss of construction knowledge and the disappearance of manuscript records. Today, Khiva continues to suffer from seasonal flooding and infrastructure stress, partly due to the disruption of these historical systems (Amirova et al. 2022).

Figure 4: Schematic plan of Ichan-Kala illustrating the rediscovered underground structures of Khiva.

Legend:

- 1, 3, 6, 8: Havuz (pools)
- 2, 4, 5: Tegizamin (cisterns)
- 7: Well-like Tegizamin

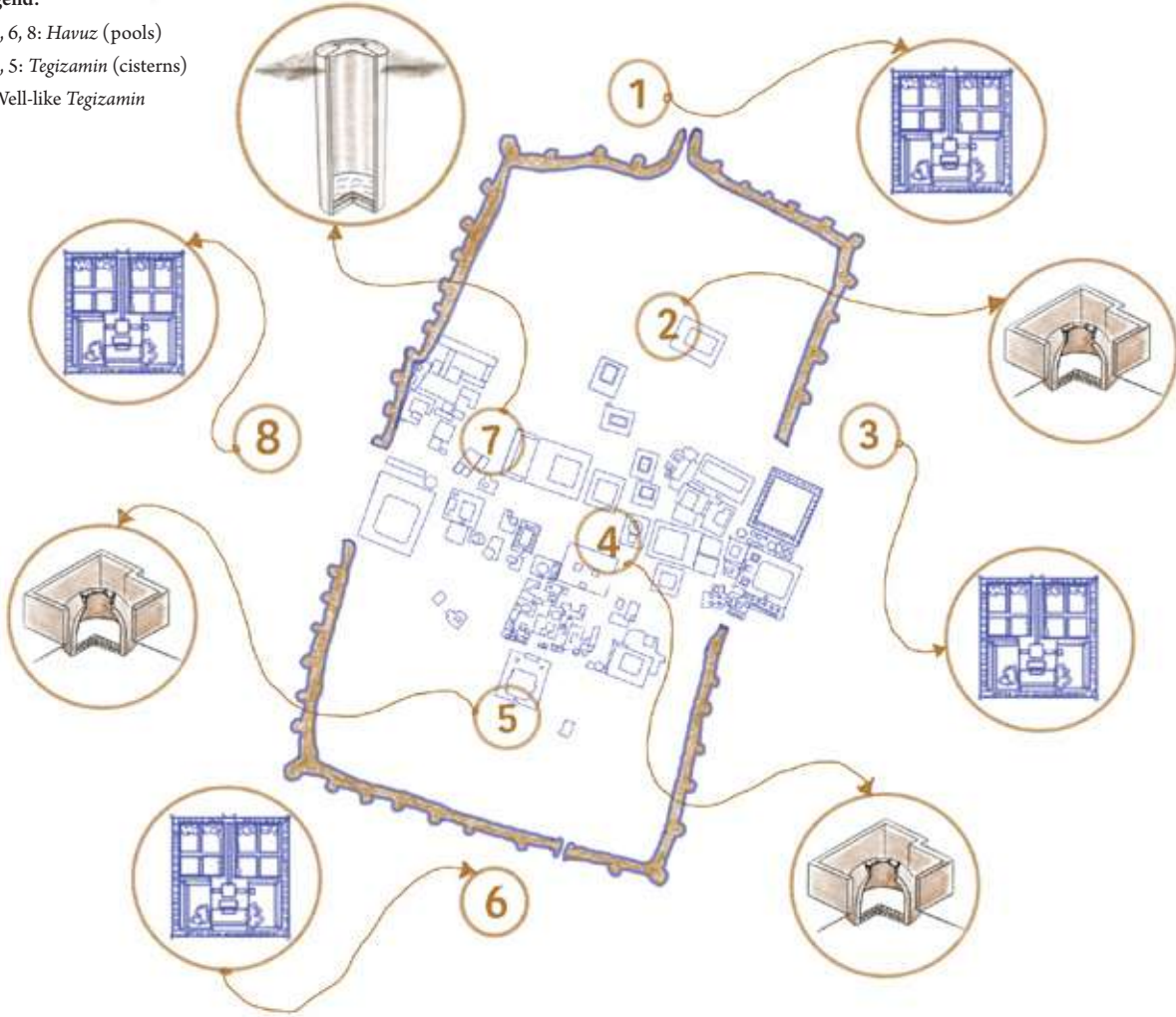


Figure 5: Tegizamin uncovered during the recent installation of communication cables near Matpanaboy Madrasah in Ichan-Kala, documented in 2022



Yet there has been a resurgence of scholarly and technical interest in recent years, particularly with the rediscovery by researchers at the Khorezm Mamun Academy of 80 handwritten notebooks by the Khorezmian builder Abdulla Boltaev (1965) (Fig.1), providing rare documentation of Khiva's underground cisterns and drainage practices including records of previously unknown structures and insights into their functional logic. Utility excavations revealing domed subterranean structures consistent with Boltaev's descriptions have corroborated these records. Among the most significant rediscoveries is the tegizamin, a vaulted cistern for rainwater harvesting and wastewater diversion, often connected to filtration basins (adan) and interior conduits (gulbidav), ensuring sanitation and flood control across domestic and public spaces (Fig. 2).

included tegizamin cisterns, gulbidav drainage conduits, adan underground basins, aryk irrigation ditches, havuz pools, etc. (Zohidov, 1997; Allayeva, 2023) (Fig. 4). These components functioned in concert to regulate both domestic wastewater and rainwater, preserving hygiene in the dense inner town.

Building on this material and Boltaev's architectural-historical context, this article seeks to synthesize archival sources, construction analysis, and proposed archaeological methods to reframe the tegizamin as a model of vernacular water infrastructure.

Historical Context and Significance

In the historic city of Khiva, the water infrastructure was different in the two main urban areas: Dishan-kala (outer city) and Ichan-kala (inner city). In Dishan-kala, pools (havuz) were the dominant water features (Fig. 3). The water systems in Ichan-kala, built on red sand,

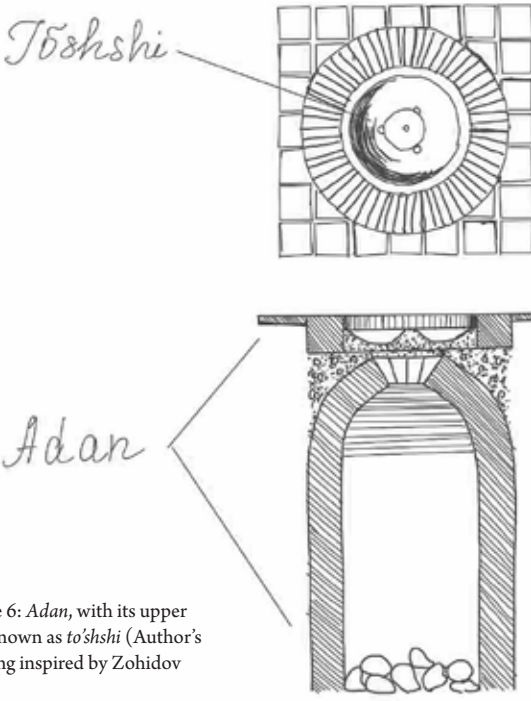


Figure 6: Adan, with its upper part known as to'shshi (Author's drawing inspired by Zohidov 1995)



Figure 7: *Sardoba* in the Kutlug Murod Inoq Madrasah courtyard in Ichan-kala

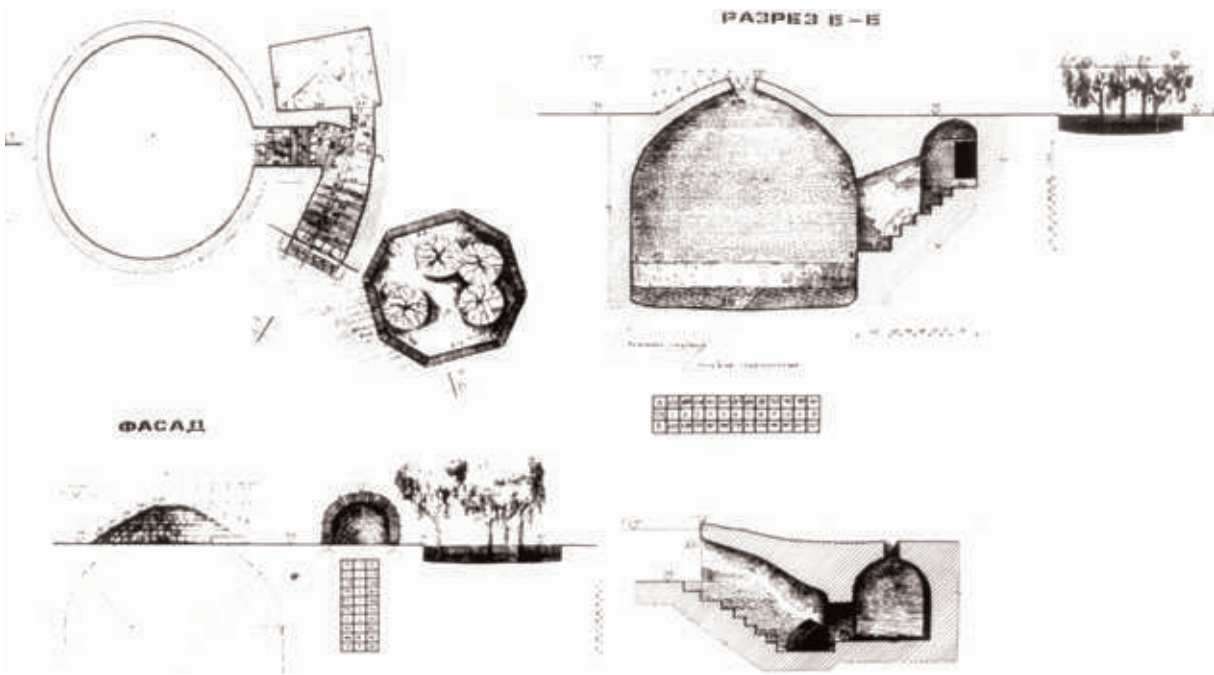


Figure 8: Hand-drawing of the *sardoba* at Kutlug Murod Inoq Madrasah, Ichan-kala (Notkin 1960)

As *tegizamin* cisterns (Fig. 5) collected wastewater and rainwater with the support of *gulbidav* and *adan* drainage systems (Fig. 6), open conduits carried excess water away from residential areas (Kantarci et al. 2015). A second type of *tegizamin*, also known as *sardoba*, stored drinking water in public courtyards, such as in madrasahs or mosques. These were domed to limit evaporation and prevent contamination (Fig. 7). The dome also signaled the presence of stored water and often had ventilation and access shafts for maintenance.

Historical records and archaeological parallels suggest that such domed cisterns were used across Central Asia as early as the Achaemenid period (Masson 1976), later spreading through Persian, Timurid, and Khorezmian building traditions. One notable example in Khiva is the *tegizamin* in the courtyard of the Kutlug Murad Inoq Madrasah, constructed in 1809, reflecting the continuity of this architectural type into the nineteenth century (Figs. 7–8).

The large open pools in Dishan-kala also fell into disuse in the twentieth century. One example is the *Soqiyo* reservoir, which collapsed in 1926 and was gradually filled in, symbolizing the broader erosion of Khiva’s traditional water systems through modernization and neglect.

Together, these systems reveal a highly localized form of hydraulic engineering, structurally efficient and embedded in urban planning and social practice. Their partial rediscovery today invites renewed appreciation of how water infrastructure shaped life from beneath the famed Khivan townscape.

Etymology and Terminology

The terminology of Khiva’s historic water infrastructure reflects an intertwining of functional utility, regional dialect, and cultural memory. *Tegizamin* is believed to derive Khorezmian *teg* (to place or store) and *zamin* (ground)—hence “placed underground” or “underground storage.” This distinguishes it from the more widely used Persian term *sardoba*, which translates as “cold water structure” and typically refers to the domed cisterns along caravan routes (Fig. 9).

The preference of the term *tegizamin* to *sardoba* in Khorezm reflects a region-specific adaptation of water terminology differing from that of other parts of Central Asia, indicating that local communities used a lexicon for hydraulic technologies tailored to their distinct topography and social practices.

In this context, *adan* would refer to shallow domestic or communal catchment pools designed to channel surface runoff, and *gulbidav* to the subterranean conduits or sand-filled filtration chambers often preceding a cistern’s intake point (Zohidov 1996).

Other terms encountered in oral accounts include *tuproq suv ombori* (clay water reservoir) and *suv to’planmasi* (water accumulation chamber), indicating a living tradition of describing such elements in contemporary Uzbek dialects. These terms document a historically embedded knowledge of water management, highlighting the importance of linguistic preservation in understanding heritage.

Construction Techniques

The *tegizamin* cistern (like a Persian *sardoba*) is a sophisticated response to the environmental challenges of Khiva’s sandy and elevated terrain. The city lacked natural runoff paths, making it vulnerable to rainwater accumulation and unsanitary conditions, particularly in the wet season. This situation became more acute in the 1830s–40s, when government officials such as Hasan Murad *Kushbegi* and Ata Murad *Kushbegi* commissioned

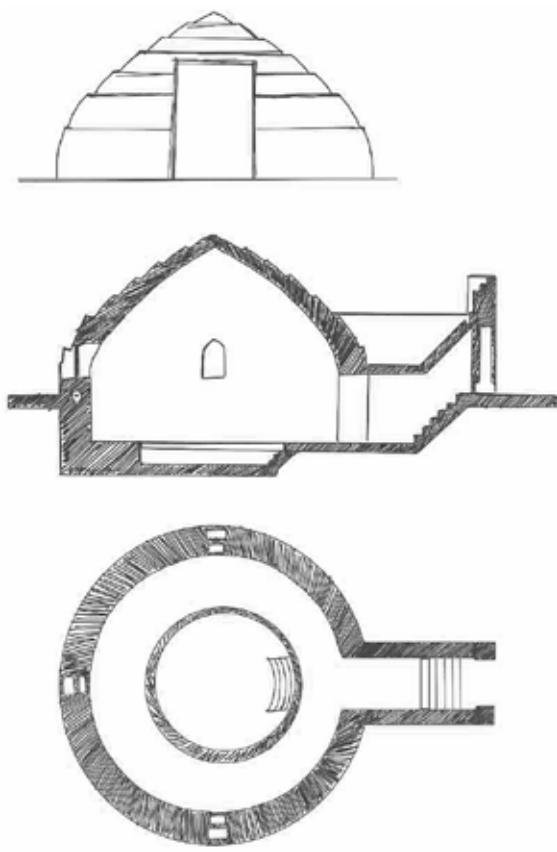


Figure 9: Plan and elevation of an ordinary Central Asian *sardoba* for water storage (Author’s drawing inspired by Zohidov 1995)

large residences around the Kuhna Ark castle. These obstructed pre-existing subterranean drainage routes, necessitating a new system for managing urban runoff and wastewater (Khaitov and Aminova 2022; Mutalov 2005: 29-30; Boltaev 1965: 64).

In response, Khiva’s master builders built a network of domed underground cisterns—*tegizamins*—with precisely engineered methods rooted in local knowledge of hydrology and construction. They first dug a circular pit some 3 to 5 meters deep and up to 15 meters in diameter. The interior was lined with concentric layers of fired clay bricks and a dome was built at ground level in the form of a load-bearing vault (Figs. 10-11). The walls were commonly built 1.2 to 1.5 meters thick, ensuring thermal insulation and mechanical stability (Azizova 2017).

According to Ahmedov (1995: 89-91), similar construction techniques—thick brick walls, radial vaulting, and *ganch* (lime-ash) plaster—were common in Khorezmian architecture, including monumental and utility structures. The walls were often more than a meter thick, for insulation and stability, while the domes minimized evaporation and external contamination.

Material choice was highly selective. Clay sourced from the lower Amu Darya region, valued for its moisture resistance,

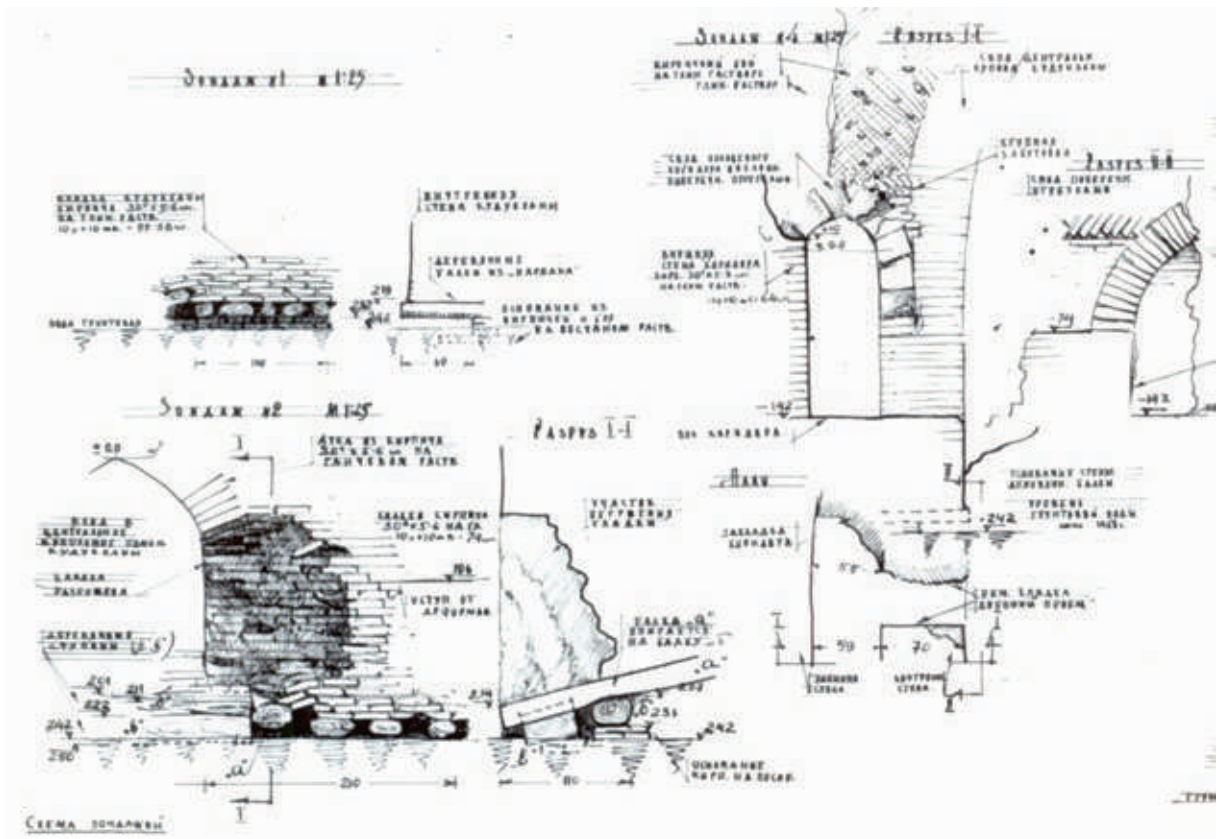


Figure 10: Hand-drawing of fired-clay brickwork in the tegizamin of Kutlug Murod Inoq Madrasah, Ichan-kala (Notkin 1960)

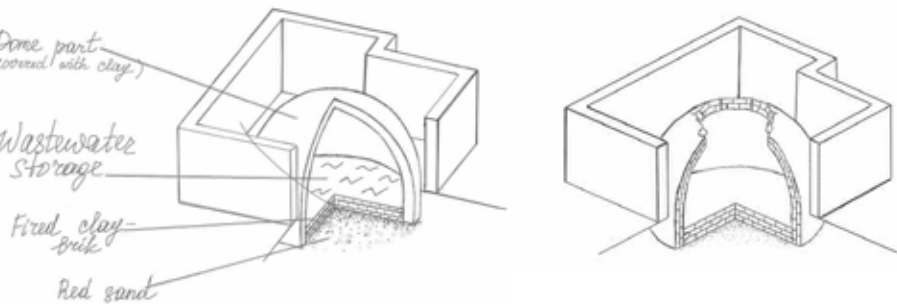


Figure 11: Cutaway of the Tegizamin dome near Matpanaboy Madrasah in Ichan-Kala. Left: closed during wastewater collection; right: in open position

was mixed with natural additives such as camel wool and mare's milk for cohesion and elasticity. Bricks were sun-dried for up to a year and selected for firing only if free of cracks and warping. Foundations were laid using *ganj* mortar, a lime-based plaster often enriched with casein or wool fiber to enhance durability and water resistance (Azizova and Osello 2020).

Tegizamins were located in such a way as to optimize natural runoff. Channels were dug with care so as not to breach impermeable soil layers, directing rainwater and wastewater to the cistern. The surrounding soil stored and gradually absorbed the water under the protective dome.

Although no cistern has yet been fully excavated, evidence from surface features and historical references suggests

that many domes were constructed using radial bricklaying techniques, possibly with earthen supports or wooden centering.

The use of lime-ash plaster (*chilpiq*) to seal interior walls is consistent with traditional practices observed in other Central Asian water systems. This waterproofing technique likely contributed to the durability of these structures, even with fluctuating groundwater levels.

One critical aspect of the tegizamin system was its restricted accessibility. The exact location of a tegizamin dome was known only to the appointed master craftsman and a few trusted individuals. To preserve the secret, the master would pass the information on to a chosen successor before death. Every ten years or so, the dome's upper layers would

be partially dismantled to remove accumulated sediment and silt (Fig. 11). The excavated material, rich in organic matter, would be repurposed by farmers as fertilizer. This practice reflects an early form of circular urban resource management (Boltaev 1965). The tegizamin was regarded as a crucial structure for both collecting rainwater and treating wastewater.

Future research, particularly if supported by archaeological excavation and material analysis, may help clarify the range of construction techniques employed, including possible typological distinctions between cisterns for wastewater and drinking water. Such studies would provide valuable data on the adaptability and performance of historical Khorezmian water infrastructure in this challenging desert climate.

These construction practices illustrate a holistic understanding of material behavior, climate response, and infrastructure resilience. The tegizamin is a prime example of how traditional Khorezmian builders synthesized empirical knowledge with functional design to create robust and adaptable systems, essential to the sustainability of historic Khiva.

Structural and Functional Analysis

The Khivan tegizamin system represents a comprehensive, historically advanced solution for urban water management, fulfilling three primary functions: rainwater retention, wastewater drainage, and potable water storage. These underground cisterns were embedded in the urban layout and vital to maintaining sanitary and sustainable living conditions from the eighteenth to the twentieth centuries.

In both Ichan-kala and Dishan-kala, tegizamins were directly connected to interior drainage by means of *adans* and *gulbidavs*, funneling wastewater and graywater from kitchens, ablution areas, etc., to the cisterns. This gravitational system had no need for pumps and leveraged Khiva's permeable sandy soil for natural filtration in a passive and eco-efficient infrastructure model.

- Functionally, Khiva's underground systems were zoned by water type (Fig. 12):
- Wastewater tegizamins were often located in domestic courtyards: dome-covered pits with diameters of 10 to 15 meters and depths of 3 to 5 meters. They received domestic graywater and rainwater, allowing gradual percolation into the subsoil.
 - Drinking-water tegizamins (*sardoba*), on the other hand, were usually integrated into public buildings, such as Kutlug Murad Inoq Madrasah (its tegizamin was built in 1810), and included stairs for controlled access. Domes prevented contamination and

evaporation. According to Islamic jurisprudence, cisterns with a surface area exceeding 100 m² were deemed fit for supplying *halal* drinking water, even when sealed for long periods (Stephan 2023; Haddad 2021).

A notable case is the Turt Shahboz tegizamin in Dishan-kala, which remained in use until the 1930s. With users estimated in the hundreds, it was a major water source. After its dome collapsed, residents had recourse to a nearby

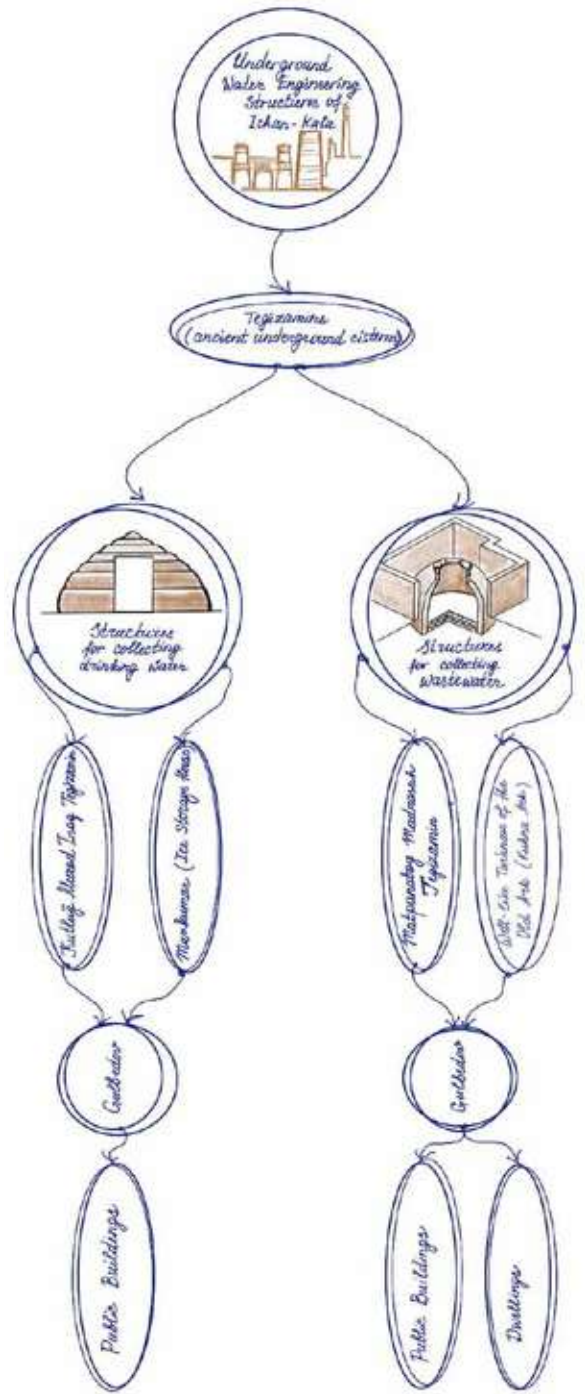


Figure 12: Diagram of the tegizamins of Ichan-kala

pool, although when the feeder channel (*aryk*) got blocked, this too became unusable. Yet restoration of the *tegizamin* in the early twenty-first century helped reinstate its historical function and significance within the Turt Shahboz complex (Mamun Academy 2018).

These subterranean structures exhibit a high degree of adaptability and structural foresight. The builders would anticipate seasonal shifts, urban settlement trends, and maintenance needs. Thus, as mentioned, many *tegizamins* were designed for periodic cleaning: the top two meters of the dome would be dismantled once a decade to remove silt, used as fertilizer.

Similar to the structures of early Khorezm, which Ahmedov (1995) describes as domed cisterns of adobe and baked brick for both religious and household purposes, the Khivan *tegizamin* reflects a continuous evolution of vernacular engineering. Such systems not only served practical needs but were connected to ritual practices, public hygiene, and urban cosmology—characteristics also seen in the monumental *sardobas* and seasonal reservoirs of the early Bukhara and Karshi settlements (Ahmedov 1995: 34–36).

Khivan *tegizamins* were often cylindrical or conical in section, echoing earlier Central Asian cistern types, with vaulted access corridors and sedimentation basins. Their domes, often finished with lime plaster or terracotta tiles,

helped regulate internal temperature and control growth of organisms. Similar protective strategies were used in the fire temples and domestic underground cooling systems of the early feudal period (Ahmedov 1995: 135–137).

All these systems reflect a layered logic of functional zoning, environmental synergy, and low-impact engineering. Although the familiar imagery of Khiva's architectural legacy is of minarets and madrasahs, the town's resilience resided in these buried structures—durable, adaptive, and integral to public health and sustainability. Their rediscovery and potential reactivation involve insights into pre-modern eco-design and urban resilience strategies relevant to present-day climate-adaptive urban planning.

Excavation and Proposed Restoration

To date, no systematic archaeological survey has been undertaken to study the *tegizamin* systems of Khiva (Fig. 13). Thus, future research might uncover the construction methods, typological diversity, and hydrological logic embedded in these buried cisterns. Future excavation efforts could begin with detailed stratigraphic analysis to determine chronological sequences and structural integrity. In line with regional comparative examples, such cisterns may feature rounded brick vaults constructed above cylindrical or conical chambers, with estimated

dimensions of 3 to 5 meters in depth and 10 to 15 meters in diameter. Their internal walls may have been coated with *chilpiq* clay and plant-ash plaster to reduce percolation and protect stored drinking water from contamination.

According to Boltayev's manuscripts (1965), test excavations along historical routes between madrasahs such as Khojamberdibai and Allakulikhan in the densely populated part of Ichan-kala may reveal the existence of underground systems for two purposes—separate cisterns for graywater and drinking water.

These might be connected to domestic inlet channels (*adan*) and sand-filtration basins (*gulbidav*), suggesting a discerning approach to water segregation and hygiene. Evidence of phased construction from the late eighteenth to the early twentieth centuries could indicate customary practices of maintenance, adaptation, and community involvement.

Materials analysis should be integrated into the excavation methodology, with attention to the possible presence of glazed ceramic drainage conduits, stone overflow spouts, and sealing slabs. Soil sampling at the cistern base could reveal natural filtration substrates such as charcoal or fine-grain sand, pointing to an empirical understanding of passive purification methods.

To avoid intrusive impacts on built heritage, non-invasive techniques such as ground-penetrating radar, 3D photogrammetry, and soil resistivity surveys should be employed to detect subsurface features. These tools would support the mapping of Khiva's buried hydrological infrastructure and clarify the extent to which the *tegizamin* system was integrated into overall urban planning.

Finally, findings from such investigations could support the development of a classification system distinguishing cisterns by function, volume, shaft geometry, and type of water treatment. This taxonomy would aid heritage conservation initiatives and serve as a model in the revision of Khiva's urban development plans, particularly in efforts to enhance sustainable water use and resilience to climate variability.

Discussion

Khiva's historical underground water systems offer valuable insights for sustainable urbanism today. Their passive, low-energy design aligns with modern climate adaptation and water resilience goals. Comparable to Persian *qanats* and Moroccan *khattaras* (Walker 2022), *tegizamins* demonstrate how localized hydrological knowledge can shape durable infrastructure. Reviving such systems may inspire context-sensitive solutions in contemporary towns and cities facing similar environmental challenges (Bahraseman et al. 2024).

As Ahmedov notes, Central Asian cities historically developed layered spatial and infrastructural organization systems, and in particular underground and courtyard-based water management suited to arid climates. These systems constituted technical solutions and typological and urbanistic patterns integrating water with domestic, religious, and public architecture (Ahmedov 1995). This historical precedent supports the notion that Khiva's infrastructure was not an exception but rather part of a broader cultural and environmental intelligence in pre-modern Central Asia.

Ahmedov (1995) also notes that pre-Soviet city planning in Khorezm incorporated decentralized water structures into each *mahalla* (neighborhood), facilitating resilience against drought and social cohesion through shared resources. Such distributed, community-based models echo modern principles of sustainable and inclusive design.

Moreover, the material and construction logic of *tegizamins*, based on resource-efficient, biodegradable, and regionally sourced materials, resonates with contemporary principles of circular construction and carbon minimization.

In this light, Khiva's historical subterranean water systems are a potential prototype. They offer strategies applicable in urban areas struggling with water scarcity, climate stress, and heritage preservation. They challenge modern planners to see infrastructure as both a utility and an embedded cultural and ecological system.

Conclusions

Our research has shown that Khiva's underground water systems, and particularly its *tegizamin* cisterns, embody a refined synthesis of environmental adaptation, material intelligence, and infrastructural foresight. These systems, built in response to the city's sandy terrain and seasonal flooding, reflect a pragmatic and sustainable approach to urban water management. The discovery of underground engineering structures in Khiva is the first known case of such findings in Uzbekistan. Although our research is ongoing and many other subterranean structures mentioned in historical manuscripts have yet to be unearthed, it suggests the likely existence of similar underground systems beneath other historic cities in the region. This study is thus a contribution to understanding Khiva's hydraulic heritage and a prelude to future research projects across Uzbekistan.

Our findings highlight the sophistication of Khiva's historical water infrastructure, not as isolated technical features but as integral components of urban design. The rediscovery and analysis of these systems illustrate climate-responsive, passive, and low-energy solutions that remain relevant for today's arid and semi-arid cities.



Figure 13: Restored *tegizamin* near the Matpanaboy Madrasah in Ichan-kala

By integrating such heritage-based practices into modern infrastructure planning, Khiva offers a scalable model for sustainable development, combining heritage preservation with innovation. In doing so, it supports the notion that ancient cities were not only culturally rich in their townscapes but also structurally and functionally advanced below ground.

References | Referencias | Referências

Ahmedov, Mukhammad. 1995. *History of the Central Asian Architecture*. Tashkent: Uzbekistan.

Allaeva, Nigora. 2018. *Khiva honligi diplomatiyasi (XVI–XIX asrlar)*. Tashkent: Adabiyot uchkunlari.

Allaeva, Nigora. 2019. *Khiva honligi diplomatiyasi va savdo alokalari (XVI–XIX asrlar)*. Tashkent: Academnashr.

Allaeva, Nigora. 2023. *Khorazm va Eron: XVI–XIX asrlarda savdo-diplomatik alokalar dinamasi*. Tashkent: Fan.

Amirova, Iroda; Petrick, Martin; Djanibekov, Nodir. 2022. *Community, state and market: Understanding historical water governance evolution in Central Asia*. Halle: IAMO.

Azizova, Bonu. 2015. Modern Architecture of Uzbekistan. *Architectural Engineering Technology*. <http://dx.doi.org/10.4172/2168-9717.1000146>

Azizova, Bonu. 2017a. Architectural Longevity-in the Case of the Summer Palace Chandra-Haully in Khiva City, Uzbekistan. *MOJ Civil Engineering*. <http://dx.doi.org/10.15406/mojce.2017.02.00045>

Azizova, Bonu. 2017b. Architectural Longevity-in the Case of the Summer Palace Chandra-Haully in Khiva City, Uzbekistan. *MOJ Civil Engineering*, 2, 5: 158-160.

Azizova, Bonu. 2023. Energy-efficient residential building in Uzbekistan using local renewable. *Journal of Physics: Conference Series*, 2600. Lausanne: IOP Conf Series.

Azizova, Bonu; Osello, Anna. 2020. Integration of Natural Elements into the Traditional House (of Khorezm Region, Uzbekistan) for Climate Improvement. *Environmental Engineering - Inženjerstvo okoliša*, 7, 1: 43-49.

Bichsel, Christine. 2021. The history of water politics in Central Asia. In Laruelle, A. C. (ed.), *Routledge Handbook of Contemporary Central Asia*, 14. London: Routledge.

Boltaev, Abdulla. 2013. *Xiva memoryi qoidalari [Architectural rules of Khiva]*. Khorezm: Khorezm.

Durdieva, Gavhar. 2012. Environmental Change as a Threat to the Khorezm Heritage. *Disaster by Design: The Aral Sea and its Lessons for Sustainability (Research in Social Problems and Public Policy)*, 20, 291-304. Leeds: Emerald Group Publishing Limited.

Durdieva, Gavhar; Azizova, Bonu. 2021. Significance of Ancient “Zakhkash-Zovur” around “Ichan-kala” in life extension of Architectural Monuments. *Design Engineering*, 9: 10200-10206.

Esfandiari Bahraseman, Sasan; Firoozzare, Ali; Zhang, Can; Yousefian, Nazanin; Skominas, Rytis; Barati, Reza; and Azadi, Hossein. 2024. Reviving the forgotten legacy: Strategies for reviving qanats as sustainable. *Water Research*, 265: 1-13.

Haddad, Marwan. 2021. Water supply, sanitation, hygienic considerations and practices in Muslim civilizations. <https://muslimheritage.com/water-supply-sanitation> (consulted on 09/04/2021).

Kantarci, Kemal; Uysal, Muzaffer; and Magnini, Vincent P. 2015. *Tourism in Central Asia: Cultural potential and challenges*. Toronto: Apple Academic Press.

Khaitov, Orif Bolikulovych; Aminova, Rukhshona. 2022a. Tourism and problems of development of historical cities (on the example of the city Khiva). *International Engineering Journal for Research & Development*, 7, 3: 5-8.

Knobloch, Edgar. 2001. *Monuments of Central Asia: A guide to the archaeology, art, and architecture of Turkestan*. London: I.B. Tauris.

Kutlug Murad Complex. 2007. <https://people-travels.com/sights/kutlug-murad-complex> (consulted on 02/05/2025).

Masson, Mikhail Yevgenyevich. 1976. *From the memoirs of a Central Asian archaeologist*. Tashkent: Gafur Ghulam Literature and Art Publishing House.

Mutalov, Oybek. 2005. *The Khiva Khanate during the reign of Allakulikhan*. Tashkent.

Notkin, Iosif Isaakovich. 1960. *Stroitel'nye priemy i konstruktstii v arkhitekture Khivi [Building techniques and structures in the architecture of Khiva]*. Tashkent: Izd-vo Akademii Nauk Uzbekskoi SSR.

Stephan, Raya Marina. 2023. Overview of Islamic water law. *XIX World Water Congress, International Water Resources Association (IWRA)*. Beijing: IWRA XVIIIth World Water Congress.

Walker, Katharine. 2022. Ancient systems keep water flowing. *Nature Middle East*. <https://www.natureasia.com/en/nmiddleeast/article/10.1038/nmiddleeast.2022.72> (consulted on 02/05/2025)

Zohidov, Pulat. 1996. *Me'mor olami*. Tashkent.

Zohidov, Pulat. 1997. *Xiva: Ochiq osmon ostidagi muzey*. Tashkent.

Biography | Biografía | Biografia

Bonu Azizova is a doctoral researcher in sustainable architecture at the Technical University of Berlin. She holds a prior PhD in architecture from the Tashkent Institute of Architecture and Construction. Her research explores the intersection of vernacular heritage, traditional water systems, and low-carbon housing in Central Asia. She has participated in international initiatives focused on energy-efficient construction and heritage preservation, and has presented her work at academic conferences across Europe and the United States.

María Prieto Vergara

Dovecotes in the Principality of Asturias: A Neglected Heritage

Los palomares en el Principado de Asturias: Un patrimonio olvidado

Os pombais do Principado das Astúrias: Um património esquecido

Keywords | Palabras clave | Palavras chave

Ethnography, Traditional building, Folk architecture, Auxiliary structures, Heritage preservation

Etnografía, Construcción tradicional, Arquitectura popular, Construcciones auxiliares, Conservación del patrimonio

Etnografia, Construção tradicional, Arquitetura popular, Construções auxiliares, Conservação do património

Abstract | Resumen | Resumo

The dovecotes of Asturias are an aspect of traditional architecture and cultural heritage intertwined with rural life. Historically associated with farming or social status, they once played a large part in domestic economies and local customs as well as being features of the landscape. They are to be found in many districts, linked to stately houses, religious edifices, or farmsteads. Most have now lost their original function and become derelict, though some notable refurbishments have been undertaken through public and private initiatives. Involvement by owners, communities, specialists, and government is vital to ensuring they are preserved and that this heritage is kept alive as a part of Asturian cultural identity.

Los palomares asturianos forman parte de la arquitectura tradicional y del patrimonio cultural vinculado a la vida rural. Históricamente asociados a la producción agropecuaria y a la distinción social, desempeñaron un papel relevante en la economía doméstica y en las costumbres locales, además de contribuir a configurar el paisaje. Su presencia se extiende por diversas comarcas, con ejemplos ligados a casas nobles, edificios religiosos y explotaciones agrícolas. En la actualidad, la mayoría ha perdido su función original y se encuentra en estado de abandono, aunque existen casos destacados de rehabilitación promovidos por iniciativas públicas y privadas. La implicación de propietarios, comunidades locales, especialistas y administraciones resulta imprescindible para garantizar su conservación y asegurar la transmisión de su memoria como parte esencial de la identidad cultural asturiana.

Os pombais asturianos fazem parte da arquitetura tradicional e do património cultural ligado à vida rural. Historicamente associados à produção agropecuária e à distinção social, desempenharam um papel relevante na economia doméstica e nos costumes locais, além de contribuírem para configurar a paisagem. A sua presença estende-se por várias regiões, com exemplos ligados a casas nobres, edifícios religiosos e explorações agrícolas. Atualmente, a maioria perdeu a sua função original e encontra-se em estado de abandono, embora existam casos notáveis de reabilitação promovidos por iniciativas públicas e privadas. O envolvimento dos proprietários, das comunidades locais, dos especialistas e das administrações é essencial para garantir a sua conservação e assegurar a transmissão da sua memória como parte essencial da identidade cultural asturiana.

Introducción

En el paisaje rural asturiano (Fig. 2), entre casonas, palacetes y alguna vivienda campesina, encontramos diversas construcciones auxiliares que antaño formaban parte de la quintana: hórreos, paneras, lagares, pajares o tendejones, entre otros. Se trata de arquitecturas concebidas para dar respuesta a las distintas necesidades de producción y consumo en un mundo eminentemente agrícola y ganadero, y que, al mismo tiempo, eran reflejo de la riqueza de quienes las poseían o administraban. A esta lista habría que añadir el palomar, un bien que, además, constituía un elemento de distinción social. Los palomares podían vincularse a edificios civiles –torres, palacios, casonas–, militares, o bien a construcciones religiosas, como capillas, oratorios o iglesias.

La consulta de fuentes archivísticas y bibliográficas, junto con el trabajo de campo, nos ha permitido conocer y documentar la historia y las características de este relevante patrimonio etnográfico, indisolublemente ligado a la cultura tradicional asturiana, pero que en la actualidad sufre abandono y desprotección, y que incluso está desapareciendo, como ocurrió, entre muchos otros casos, con el palomar del palacio de Valdesoto (Fig. 1), en Siero.

Breve reseña histórica

Las prácticas de la cría y la domesticación de la paloma (Fig. 3) han estado presentes en la historia de distintas civilizaciones, datándose los primeros testimonios en

Oriente Medio hacia el año 3000 a. C. Sin embargo, fueron los griegos y, posteriormente, los romanos quienes le otorgaron una mayor importancia en su economía doméstica, tal como señala el escritor y agrónomo gaditano Lucio Junio Moderato Columela en su obra *De re rustica*, donde dedica a esta ave unas líneas en el capítulo VIII del libro VIII, *Del modo de engordar las palomas torcaces y de otras castas, y del establecimiento del palomar* (Tinajero 1879: 66-69).



Figura 1: Palomar hoy desaparecido del palacio de Valdesoto, propiedad de los marqueses de Canillejas. Siero, c. 1895 (Registro 14.347, Muséu del Pueblu d'Asturies)



Figura 2: Localización de los palomares del Principado de Asturias citados en el artículo

- 1. Oscos-Eo:** Castropol, San Martín de Oscos, San Tirso de Abres, Santa Eulalia de Oscos, Taramundi, Vegadeo y Villanueva de Oscos.

Palomar de la casona de los Bermúdez, Iramola, Castropol

Palomar de Villa Rosita, Castropol

Palomar de Siores, Castropol

Palomar de Aguillón, Taramundi

Palomar de una casona en el Piantón, A Veiga, Vegadeo

2. Parque Histórico de Navia: Boal, Coaña, El Franco, Grandas de Salime, Illano, Navia, Pesoz, Tapia de Casariego y Villayón.

Palomar del palacio de Mohías, Coaña

Palomar del palacio de Miudes, El Franco

Palomar del palacio de los Castropol, El Franco

Palomar Villarpedre, Grandas de Salime

Palomar de Casa Mingón, Santesteba, Illano

Palomar del palacio de Andés, Navia

Palomar del palacio de Campoamor, Campos, Navia

Palomar de Casa Barbacana, Doiras, Boal

Palomar de Vilabriye, Pesoz

Palomar de Villamil, Tapia de Casariego

3. Comarca Vaqueira: Allande, Cudillero, Salas, Tineo y Valdés.

Palomar de la iglesia de Santo Miyao, Allande

Palomar de Doriga, Salas

Palomar de Casa Mariqueta, Tinéu

Palomar de Villa Tarsila, Luarca, Valdés

4. Fuentes del Narcea: Cangas del Narcea, Degaña e Ibias.

Palomar del palacio de Los Sierra o Jarceley, Cangas del Narcea

Palomar de una casa en Naviegu, Cangas del Narcea

Palomar del monasterio de Corias, Cangas del Narcea

Palomar en una bodega, Souto de Cibuyu, Cangas del Narcea

Palomar del palacio Queipo de Llano, Cangas del Narcea

Palomar en el Chao do Castro, Rideporcos, Ibias

Palomar en una casa en Vilardecendias, Taladriz, Ibias

5. Bajo Nalón: Muros de Nalón, Pravia y Soto del Barco:

Palomar de El Otero, Pravia

Palomar de Villa Vista Hermosa, Riberas de Pravia, Soto del Barco

6. Camín Real de la Mesa: Belmonte de Miranda, Candamo, Grado, Las Regueras, Proaza, Quirós, Santo Adriano, Somiedo, Teverga y Yernes y Tameza.

Palomar de la rectoral, San Tisu, Candamu

Palomar del palacio de Casares, San Tisu de Candamu

Palomar en el barrio de La Pumariega, Ambás, Grau

Palomar de Vigaña, Grau

Palomar de Santianes, Grau

Palomar de Villamarín, Grau

Palomar de Tolinas, Grau

Palomar de Ambás, Grau

Palomar en Repuas, Biedes, Les Regueres

Palomar de la antigua rectoral de Cogollu, Tresmonte, Les Regueres

7. Comarca de Avilés: Avilés, Castrillón, Corvera de Asturias e Illas.

8. Comarca del Nora: Llanera, Noreña y Siero.

Palomar de la casa El Peñeo, La Piniella, Llanera

Palomar del palacio de Cañe, San Cucao, Llanera

Palomar de la Bérbola, Cayés

Palomar del palacio de Miraflores, Noreña

Palomar del palacio de Valdesoto, Siero

9. Oviedo:

Palomar de la casona de los Navia Osorio, Las Caldas, Uviéu
- 10. Montaña Central:** Aller, Lena, Mieres, Morcín, Ribera de Arriba y Riosa.

Palomar delante del palacio Figareo, Mieres

Palomar del palacio El Vallitu, Cuna, Mieres

Palomar del palacio de Arriba, Cenera, Mieres
- 11. Cabo Peñas:** Carreño y Gozón.

Palomar de El Palacio, Carrió, Carreño

Palomar de Perlora, Carreño

Palomar del palacio de los Menéndez Pola, Lluanco, Gozón

Palomar de Casa Mori, Lluanco, Gozón
- 12. Gijón:**

Palomar en Valdornón, Xixón
- 13. Valle del Nalón:** Caso, Langreo, Laviana, San Martín del Rey Aurelio y Sobrescobio.
- 14. Comarca de la Sidra:** Bimenes, Cabranes, Colunga, Nava, Sariego y Villaviciosa.

Palomar del palacio de Les Portielles, Villaviciosa

Palomar de Valdediós, Villaviciosa

Palomar de El Castiellu, San Pedru Ambás, Villaviciosa

Palomar del palacio de Sorribas, Cazanes, Villaviciosa

Palomar de la casa-palacio García-Mauriño, San Andrés de Bedriñana, Villaviciosa

Palomar de La Rozada, Samartín del Mar, Villaviciosa

Palomar de Lliberdón, Colunga
- 15. Oriente de Asturias:** Amieva, Cabrales, Cangas de Onís, Caravia, Llanes, Onís, Parres, Peñamellera Alta, Peñamellera Baja, Piloña, Ponga, Ribadedeva y Ribadesella.

Palomar del palacio de Las Mieres, Prau, Caravia

Palomar del palacio Soto Cortés, Labra, Cangas de Onís

Palomar de Villar, Onís

Palomar de Casa Gozalo, Riegu, Llanes



Figura 3: Palomas en el palomar de la fortaleza de La Valeta, Malta (Carlos Javier García Sánchez)



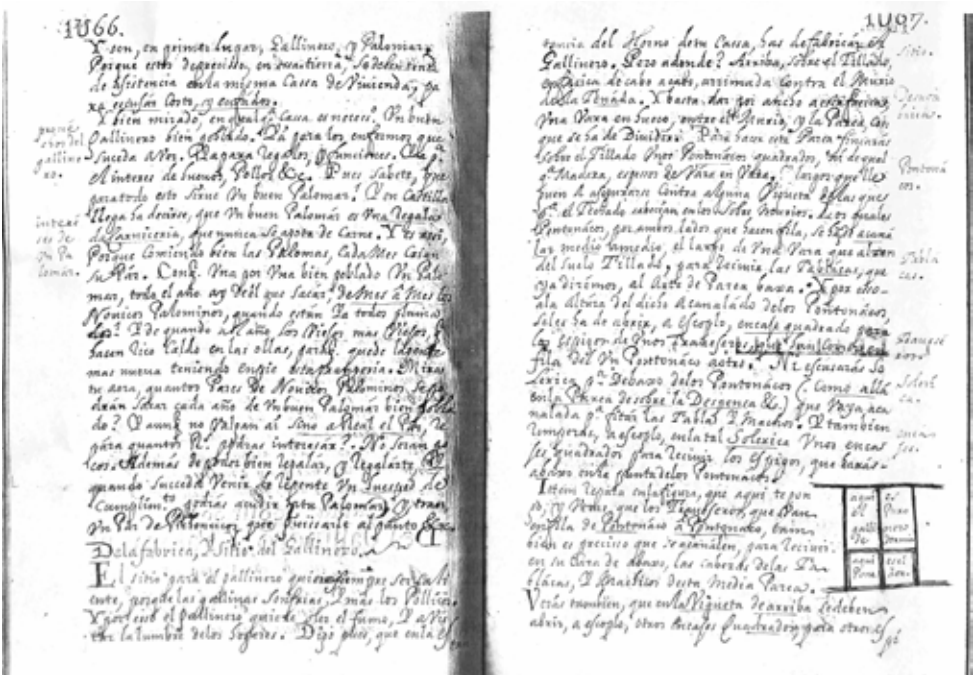
Figura 4: Palomar teresiano, Gotarrendura, Ávila. (María Jesús Carravilla)

A lo largo de la Edad Media, en los distintos reinos peninsulares, los palomares adquirieron un papel destacado, quedando vinculada su propiedad a monarcas, señores feudales y eclesiásticos. En Asturias, por ejemplo, los monasterios cistercienses de Santa María de Villanueva de Oscos y San Juan Bautista de Courias los poseían, ya que la orden apreciaba el consumo de la carne de esta ave por considerarla menos contaminada. La facilidad de las palomas para procurarse alimento y su extraordinario sentido de la orientación hicieron que, en estas tierras nortañas, especialmente en periodos de inestabilidad política –como las luchas dinásticas entre miembros de la familia Trastámara–, no sólo se emplearan como sustento alimenticio, sino también como aves mensajeras.

Durante el Siglo de Oro español, las referencias literarias a las palomas y a los palomares son abundantes, apareciendo en obras como *La pícara Justina*, *El ingenioso hidalgo Don Quijote de la Mancha* o *La vida de Lazarillo de Tormes y de sus fortunas y adversidades*. Lo mismo ocurre en los recetarios de la época, donde se describen diversas formas de preparar esta ave, como en el *Libro de guisados, manjares y potajes*, fechado en 1529 y cuyo autor, Ruperto de Nola, fue Cocinero Mayor del rey don Fernando de Nápoles.

Hay palomares cuya historia está ligada a personajes de fama universal, como el de la localidad de Gotarrendura (Fig. 4), en Ávila, que perteneció a la familia de santa

Figura 5: Texto manuscrito de fray Toribio de Santo Tomás y Pumarada, *Arte General de Grangerías* (1711-1714) (B/C CRS a-9, Archivo Histórico Dominicano de la Provincia de España, Salamanca)



Teresa de Jesús y que ella cita en varias ocasiones en sus escritos. Especialmente significativas son sus palabras del 10 de enero de 1541, cuando expresa su preocupación por el cuidado del palomar: “Sr. Venegrilla, tenga la merced de cebar y cuidar bien el palomar en estos meses de frío, ahora que está bien poblado” (Romera et al. 2015: 13). En otra carta, del 10 de julio de 1546, lo menciona como fuente abundante de alimento para celebraciones señaladas: “[...] hacedme merced de enviar doce palominos la víspera de Santiago que yo me holgaré mucho de ello” (Romera et al. 2015: 13). Un palomar como este, con unos 700 nidales, podía producir al año alrededor de 3.000 palominos, lo que lo convertía en un bien muy apreciado por la familia Cepeda-Ahumada.

Otro testimonio relevante es el del palomar situado cerca de la localidad de Namur, en los Países Bajos, donde en 1578 pasó sus últimos momentos de vida el héroe de Lepanto, don Juan de Austria: “traíanle en hombros en una camilla de campaña [...], preguntó por el alojamiento de don Bernardino de Zuñiga su criado [...] como estaba en una granja [...]. Era un caseron viejo y mui malo, no avia sino un palomar donde hazerle aposento. Quitaronle la palomina, limpiaronle, colgaronle unos reposteros por el techo y paredes, por tapar las lumbreras [...]” (Vander-Hammen y León 1627: 325).

De la Época Moderna datan buena parte de los palomares que conocemos en Asturias. En el último siglo de este período, fray Toribio de Santo Tomás y Pumarada, ilustre dominico asturiano, escribió un amplio y detallado *Arte General de Grangerías*. Esta obra, redactada entre 1711 y 1714 y dirigida a su sobrino, tenía como propósito que, gracias a las enseñanzas y consejos en ella reunidos, este

puediera dejar atrás la pobreza y liberarse “de la esclavitud de los caciques de ese pays” (Pumarada 2006: 516)¹.

En la segunda parte del tratado, dedicada a las *Grangerías Temporales*, aborda, entre otros muchos temas relacionados con la vida doméstica y el mundo rural, el de las palomas y los palomares. En los apartados “De la fábrica y sitio del palomar” y “De la sacca y provechos de tu palomar que son muchísimos”, no sólo describe la construcción y ubicación del palomar, sino que también alaba el carácter dócil y sociable de estas aves, así como los distintos aprovechamientos que de ellas se hacían: económicos, culinarios y curativos (Fig. 5). El texto dice lo siguiente (Pumarada 2006: 973-974):

Y en Castilla llega a decirse que un buen palomar es una regalada carnicería que nunca se agota de carne. Y es así porque comiendo bien las palomas, cada mes crían su par. Conque una por una bien poblado un palomar; todo el año ay de él que sacar, de mes a mes, los novicos palominos quando están ya plumados. Y de quando al año, los viejos más viejos, que hacen rico caldo en las ollas, para que quede la gente más nueva teniendo en pie esta. Mira tú aora cuántos pares de novicos palominos se podrán sacar cada año de un buen palomar bien poblado. Y aunque no valgan aí sino a real el par, repara cuántos reales podrás interesar. No serán pocos. Además de poder bien regalar y regalarte, y quando succeda venir de repente un huesped de cumplimiento podrás acudir a tu palomar y traer un par de pichoncicos que guissarle al punto, [...]. Arriba se dixo que el sitio pintado para tu real palomar ha de ser el desbán de sobre el tillado del quarto baxo y despensa de tu cassa nueva [...].

Tipologías y características

Se han documentado palomares a lo largo de todo el Principado de Asturias; sin embargo, es en los concejos correspondientes a las comarcas centrales –Camín Real de la Mesa (Fig. 6), Montaña Central y Nora²– donde se localiza el mayor número de ellos.

En el momento de construir un palomar se cuidaba especialmente la elección del emplazamiento –con presencia de agua en las proximidades– y la orientación, preferentemente hacia el mediodía, para asegurar una buena ventilación y una adecuada insolación. La mayoría

son construcciones exentas, próximas a la vivienda, y en menor medida integradas en ella, lo que facilitaba un mejor control. También pueden encontrarse en espacios abiertos y rodeados de tierras de labor, donde la vigilancia resultaba menos estricta, como ocurre con el palomar de Villar, en Onís; el de Chao do Castro, en Rideporcos (Ibias); el del palacio de Sorribas, propiedad de los marqueses del Real Transporte, en Cazanes (Villaviciosa); o el de Repuas (Fig. 7), en Biedes, concejo de Les Regueres. En todos los casos los palomares aportaban a sus dueños el consabido prestigio social. No en vano, en Galicia suelen asociarse a los pazos: “torre, palomar y ciprés, pazo es” (Yebra 2000).

Una característica común de los palomares asturianos es su reducido tamaño en comparación con los de Castilla-La Mancha (Castilla Pascual et al. 2020: 447-462) o Castilla y León (Díez Anta 1993). Sirvan como ejemplos representativos el palomar del Arcediano, en Ciudad Real, situado a pocos kilómetros de la capital en la carretera de Toledo, con unos 10.000 nidales, o el de Valderas, en Tierra de Campos, al norte de la provincia de León, con alrededor de 5.000.

En Asturias, el número de nichos por palomar desciende de forma notable. Destacan el del palacio de Cañe, en San Cucao (Llanera), y el de El Palacio, en Carrió (Carreño), cada uno con unos 600 nichos³. Les siguen, a bastante

distancia, otros como el de la casona de los Navia Osorio, en Las Caldas (Uviéu); el del palacio de Las Mieres, en Prau (Caravia) (Fig. 8); el del palacio de Les Portielles, actualmente en ruinas, y el de Valdediós, ambos en Villaviciosa; el de Casares, en Xixón; el del palacio de Miraflores, en Noreña; el del palacio de los Menéndez Pola, en Lluanco (Gozón); o el de la antigua rectoral de Cogollu, en Tresmonte (Les Regueres) (Fig. 9), con algo más de 300 nidales, por citar algunos.

Como ya se ha señalado, en Asturias existen palomares tanto exentos como integrados, cuyas tipologías y materiales los asemejan a los gallegos y los diferencian notablemente de los de tierras leonesas y de Tierra de Campos, donde



Figura 6: Palomar en el barrio de La Pumariega, Ambás, Grau, comarca del Camín Real de la Mesa (Ayuntamiento de Grau)



Figura 7: Palomar en Biedes, Les Regueres



Figura 8: Palomar del palacio de Las Mieres, Prado, Caravia (Alejandro Fernández Braña)



Figura 9: Interior del palomar de la antigua rectoral en Tresmonte, Les Regueres



Figura 10: Palomar en El Otero, Pravia (Alejandro Fernández Braña)

la variedad de formas es mucho mayor. Un caso aparte lo constituyen los palomares de construcción reciente, muchos de ellos levantados a partir de mediados del siglo XX en parques públicos y jardines privados, con una función principalmente ornamental. Algunos destacan por sus ingeniosas soluciones y formas, como el de El Castiellu,



Figura 11: Palomar de Villa Vista Hermosa, Riberas de Arriba, Pravia (Alejandro Fernández Braña)

en la parroquia de San Pedru Ambás (Villaviciosa); el de El Otero (Fig. 10), en Pravia; el de Villa Vista Hermosa, en Riberas de Pravia (Fig. 11), Soto del Barco; el de Villa Tarsila, en Luarca; el de Perlora, en Carreño; o el de Lliberdón, en Colunga, que cuenta con una pasarela de madera para acceder a su interior.

Figura 12: Al fondo, palomar de Villa Rosita, Castropol (Alejandro Fernández Braña)

Figura 13: Palomar en Aguillón, Taramundi (Ástur Paredes)

Figura 14: Palomar del palacio de Andés, Navia (Alejandro Fernández Braña)



Figura 15: Palomar en una casa en Vilardecendias, Taladriz, Ibias (Ana María Iglesias Fernández)



Figura 17: Bodega con palomar, Soutu de Cibuyu, Cangas del Narcea (Grupo de Desarrollo Alto Narcea Muniellos)

Figura 16: Palomar de Casa Mori, Luanco (Alejandro Fernández Braña)

En las construcciones exentas y de apariencia turriforme, la planta suele ser cuadrada o circular, siendo escasos los ejemplos de palomares con planta poligonal. Estos últimos se encuentran con mayor frecuencia en el occidente de la región, como el de una casona en El Piantón, en A Veiga (Vegadeo); el de Villa Rosita (Fig. 12) y el de Siales, ambos en Castropol; el de Aguillón (Fig. 13), en Taramundi; o el situado en los jardines del palacio de Andés (Fig. 14), en Navia.

Además de los modelos ya citados, existen palomares integrados en otras edificaciones. Los que se alojan en la



Figura 18: Molino con palomar en el monasterio de Courias, Cangas del Narcea



vivienda ocupan casi siempre la bajocubierta, como el de la torre del palacio de Miudes o de los Castropol, en El Franco; el de una casa en Vilardecendias (Fig. 15), Taladriz, en Ibias; el del palacio de Campoamor, en Campos, Navia; el del palacio de Los Sierra o Xarceléi, y el de una casa en Naviegu, ambos en Cangas del Narcea; o el colorista y ornamentado palomar de Casa Mori, en Lluanco (Fig. 16), Gozón. También hay palomares vinculados a arquitecturas religiosas, como el de la iglesia parroquial de Santo Miyao, en Allande, situado en lo alto del presbiterio, o el de la casona de los Bermúdez, en Iramola, Castropol, integrado en la capilla, casos estos verdaderamente excepcionales.



Figura 19: Palomar en Casa Gozalu, Riego, Llanes (Alejandro Fernández Braña)

También existen palomares integrados en construcciones auxiliares. Sirvan como ejemplo el habilitado en la parte superior de una bodega en Souto de Cibuyu (Fig. 17), y la edificación con horno en Naviegu, ambos en Cangas del Narcea; el situado sobre una cuadra, en la parroquia de Santo Miyao, en Allande; o la torre exenta con pajar de Casa Barbacana, en Doiras, Boal. Como curiosidad, destaca el palomar del monasterio de Courias (Fig. 18), en Cangas del Narcea, cuya planta baja alberga un molino harinero que aprovechaba el caudal del río Narcea.

Hay palomares que son bienes muebles: cajas portátiles o cajones de madera con forma de pequeñas jaulas, con acceso en una de sus caras, que generalmente se cuelgan en corredores o en la parte exterior de viviendas, hórreos o molinos. En Galicia se conocen como *pombeiros*. El ilustrado gijonés Gaspar Melchor de Jovellanos (1744-1811), en sus *Cartas del viaje de Asturias*, los menciona al hablar de los hórreos: “[...] un edificio que sirva a un mismo tiempo de granero, despensa, dormitorio, colmenar, y palomar, [...]” (Jovellanos: 166-167). Los ejemplares documentados de esta tipología son escasos; entre ellos, el palomar que cuelga del hórreo de la casa El Peñeo, en La Piniella, Llanera; el de una panera en Valdornón, concejo de Xixón; o el que adorna las paredes de Casa Gozalo, en Riego (Fig. 19), Llanes. Esta asociación de palomares portátiles y hórreos también se observa en otras zonas del país, como en Vilariño (Orense), Rabuñade (Pontevedra) o Villar de Otero, en la provincia de León.



Figura 20: Palomar desaparecido situado delante del palacio Figareo, Mieres (Alejandro Fernández Braña)

Otros palomares muebles son aquellos que, a semejanza de un hórreo, se elevan del suelo y presentan una caja de madera con pequeñas ventanas o buretas por donde entran y salen las palomas, protegida con tejas de barro. Un hermoso ejemplo fue el desaparecido palomar que se encontraba frente al palacio Figareo (Fig. 20), en Mieres. (Ruiz 2004: 70-78).

La traza de la planta del palomar determinará el aspecto de su cuerpo y, por consiguiente, la forma de su cubierta. Cuando el edificio presenta planta circular, los tejados suelen ser cónicos o de una sola agua –a la *molinera*–, denominados en Galicia de *ferradura*, como el de Villarpedre, en Grandas de Salime; el de Vilabriye, en Pezós (Fig. 21); o el de Casa Mingón⁴, situado poco antes de la *sierra*⁵ de Silvela, en Santesteba, único testimonio existente en el concejo de Eilao. No obstante, existen casos excepcionales, como el palomar de San Tisu, en Candamu, próximo a la iglesia parroquial, que, a pesar de su planta circular, cuenta con una cubierta a cuatro aguas. En cuanto a los tejados de dos y cuatro aguas, se encuentran en palomares de planta cuadrada, mientras que en los de base poligonal se opta por cubiertas de pabellón o prismáticas.

En el exterior de los palomares, en ocasiones, se incorporan elementos que contribuyen a embellecerlos: cruces en los vértices de las cubiertas; remates triangulares que, a modo de merlones, coronan los aleros –como sucede en el palacio de Mohías/Mouguías (Fig. 22), en Cuaña, o en

el de Villamil, en Tapia–; o piñones de cerámica como los que adornan el palomar de La Bérbola, procedentes de la cercana Fábrica Guisasaola, en Cayés, Llanera (Cerámicas 1998). Estas piezas, además de su función ornamental, sirven de referencia para la orientación de las palomas, como ocurre en el moderno palomar de Otero, en Pravia. Así lo señala el ya citado fray Toribio de Santo Tomás y Pumarada en su tratado de *Grangerías*: “[...] pintar y hacer de madera tres o cuatro palomas con la cola e alas extendidas [...]”. Viendo los palomos que andan en la campaña estas banderas, piensan que aquellos palomos pintados son vivos y que se van a asentar sobre aquel texado” (Pumarada 2006: 980). En la rehabilitación del palomar del palacio de Arriba, en Cenera, Mieres, se recuperó una pequeña paloma tallada en madera que, en origen, remataba el vértice de la antigua cubierta.

Las paredes exteriores de los palomares suelen ser lisas y cerradas, con un único vano en la parte inferior correspondiente a la puerta de entrada. No obstante,

no es raro que esta puerta, situada a media altura, esté acompañada por una o dos pequeñas ventanas. En la parte superior, sobresaliendo de la vertical del muro, se dispone una delgada solera de piedra, a veces doble, que, a modo de línea de imposta, recorre todo el perímetro de la construcción o solo parte de él. Esta pieza, conocida como aviadero o *tornarratos*, sirve de punto de reposo a las palomas, tanto a su llegada como a su partida. Sobre esta repisa se abren pequeñas ventanas o buretas de paso que facilitan su acceso (Fig. 23).

Los interiores son diáfanos y pueden destinarse exclusivamente a la cría de palomas o dividirse en dos niveles. En este último caso, la planta baja, con suelo de piedra o tierra pisada, se utiliza como cuadra para animales de pequeño tamaño, corral, gallinero o almacén, mientras que la parte superior se reserva para las palomas, con sus nidas. La separación entre ambos espacios se realiza mediante una sencilla estructura horizontal o entramado de madera.



Figura 21: Palomar con cubierta a la molinera, Vilabriye, Pezós (Alejandro Fernández Braña)



Figura 22: Palomar del palacio de Mohías, Cuaña (Alejandro Fernández Braña)



Figura 23: Exterior del palomar del palacio Casares, San Tisu, Candamu
Figura 24: Nidales en uno de los palomares del palacio de Doriga, Salas (Alejandro Fernández Braña)
Figura 25: Nidales de madera en el palacio de Casares, San Tisu, Candamu



Los nidales, también llamados hornillas, oracas, pateras, nichos o nichas (Díez 1993: 38), se construyen sobre los muros previamente preparados, siguiendo una disposición horizontal más o menos ordenada, ya sea en retícula, al tresbolillo o en cuadrícula. Habitualmente se elaboran con la piedra propia del lugar, labrada o en lascas, o bien con ladrillo macizo. Pueden encontrarse muy próximos al suelo, como en el palomar de la casa-palacio de la familia García-Mauriño, en San Andrés de Bedriñana, Villaviciosa⁶; aunque lo habitual es situarlos a mayor altura, para mantenerlos alejados de la humedad y de los roedores, como sucede en el palomar de Doriga, en Salas (Fig. 24). Para facilitar el acceso a los nichos fuera del alcance del avicultor se dispone una escalera de madera⁷. (Violet-Le-Duc 1854-1868: 482-490).

Allí donde las paredes son lisas, se instalan rudimentarias cajas o repisas de carpintería de madera, como en el palomar del palacio de Casares (Fig. 25), en San Tisu de Candamu. En el centro del palomar, a ras de suelo o sobre un pedestal, suele colocarse una pila o cazoleta de piedra para que las aves dispongan de agua, comida y plantas aromáticas. Se crea así un entorno agradable con el fin de atraer al mayor número posible de palomas, como en el caso del palomar de la casona de los García-Mauriño.

Materiales y elementos integrantes

En Asturias, la piedra es el material predominante en la construcción de los palomares, a diferencia del barro – cocido en forma de ladrillo o en crudo como adobe o tapial– habitual en la cercana provincia de León. El tipo de piedra empleada está condicionado por la geología de cada zona; así, en los palomares del occidente asturiano se utiliza principalmente la pizarra, como en el del palacio Queipo de Llano, en Cangas del Narcea (Figs. 26 y 27), mientras que en el resto de la región se recurre a la arenisca, la cuarcita o la caliza.

En las construcciones de cronología más reciente es habitual el uso de ladrillo macizo visto, como en el palomar de Biedes, en Les Regueres, y en el del palacio Soto Cortés, en Labra (Fig. 28), Cangues d’Onís. También es frecuente combinar este material con listones de madera, como en uno de los palomares del palacio de Doriga, en Salas (Figs. 29 y 30).

Para los dinteles y jambas de los vanos se emplea sillar o sillarejo, reservando la mampostería para el resto de la construcción, todo ello trabado con mortero de cal y arena. Las paredes, tanto exteriores como interiores, se revocan,

con el fin de proteger al palomar de la lluvia, la humedad y la vegetación, factores que podrían dañarlo. Además, se prolonga así su durabilidad y se dificulta el acceso de roedores y otras alimañas. Gabriel Alonso de Herrera, en su obra *Agricultura General* (1513), comenta: “[...] sean las paredes bien blanqueadas por de dentro y por fuera, y muy

lisas, porque lo uno por ellas no pueda gatear ni sobir nada, y aun porque con lo blanco se huelgan mucho las palomas, y vienen mas á los palomares; y siendo las paredes muy lisas no puede subir nada que les dañe; viven mas seguras y sin temor, que son muy temerosas, y asi viven mas” (Alonso de Herrera 1819 [1513]: III, 469).



Figura 26: Vista general del palacio Queipo de Llano y su palomar, que antes de su rehabilitación tenía cubierta original de pizarra, Carballo, Cangas del Narcea (Grupo de Desarrollo Alto Narcea Muniellos)
Figura 27: Palomar con nueva cubierta de teja en el palacio Queipo de Llano, Carballo, Cangas del Narcea (Grupo de Desarrollo Alto Narcea Muniellos)

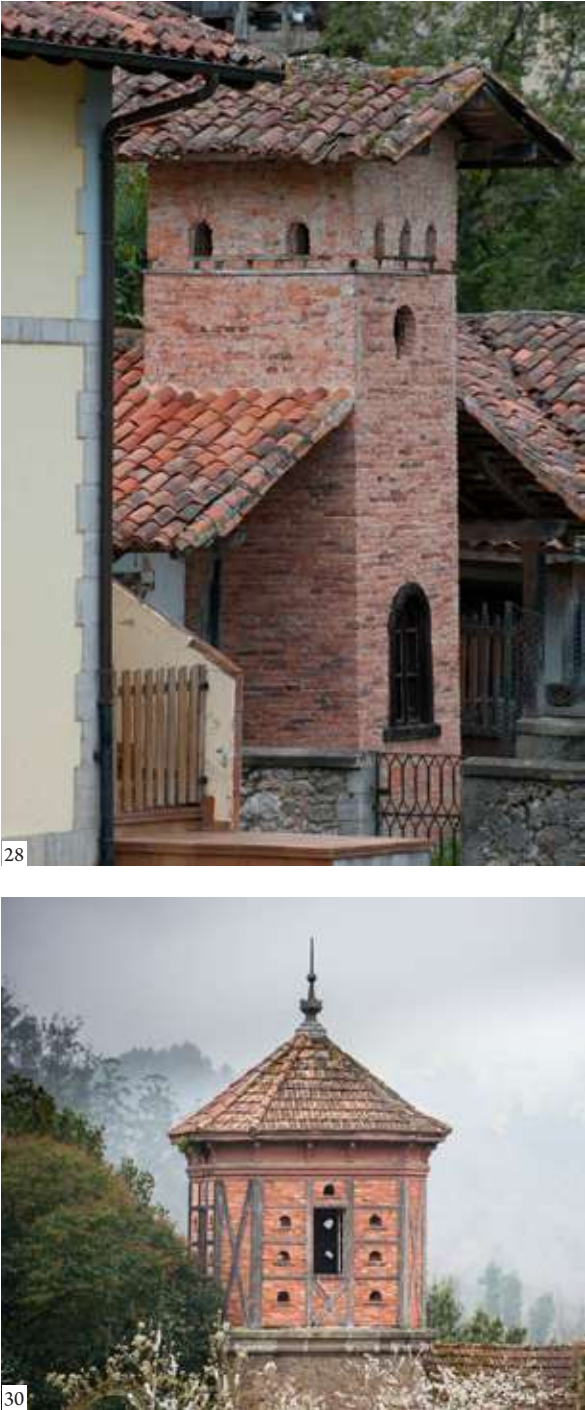


Figura 28: Palomar del palacio Soto Cortés, Labra, Cangas de Onís (Alejandro Fernández Braña)
Figura 29: Palomares de los jardines del palacio de Doriga, Salas (Alejandro Fernández Braña)
Figura 30: Detalle de uno de los palomares de los jardines del palacio de Doriga, Salas (Alejandro Fernández Braña)



Figura 31: Interior del palomar del palacio Menéndez Pola, Lluanco (Alejandro Fernández Braña)

La armazón o estructura de la cubierta del palomar se compone de grandes vigas de roble o castaño, que queda cubierta por lajas o *llábanas* de pizarra, material más característico del occidente. En el resto del territorio predomina la teja curva de barro cocido, como se aprecia en el palomar del palacio Menéndez Pola, en Lluanco (Fig. 31), dispuesta a veces en dos capas superpuestas y, en otras ocasiones, simplemente a canal y cobija⁸.

La mayoría de los palomares asturianos están vinculados a casonas y palacios de familias linajudas. De estos inmuebles tenemos documentadas sus fechas de construcción, aunque no sucede lo mismo con los palomares ni con otros muchos bienes muebles o inmuebles auxiliares. Las razones se encuentran, principalmente, en su carácter utilitario y



Figura 32: Palacio del Valletu, con palomar (a la izquierda de la imagen), panera y otras dependencias auxiliares, propiedad de la familia Vázquez de Prada, Cuna, Mieres

en las continuas intervenciones que han experimentado a lo largo de su existencia, como ejemplifica el palacio del Valletu, propiedad de la familia Vázquez de Prada (Fig. 32), en Cuna, concejo de Mieres.

Algunos palomares próximos geográficamente presentan grandes similitudes constructivas, lo que hace pensar que pudieron haber sido obra de un mismo cantero local o maestro alarife, como probablemente ocurrió con los palomares de Peñerúes, en Morcín, y los de Valletu y Baña, en Mieres. Este último conserva en el dintel de la puerta una labra con la fecha de su posible construcción (Fig. 33), aunque existe duda en la lectura de la segunda cifra: [...] dos/ [...] icose el año de 1[;5/7?]65 don m[...]⁹ (Inventario 1997: 3).

Figura 33: Inscripción en el dintel de la puerta del palomar de Baña, Mieres (José Ramón Viejo)



Presente de los palomares

El presente de los palomares en el Principado de Asturias es incierto. En la Ley 1/2001, de 6 de marzo, de Patrimonio Cultural del Principado de Asturias, estos bienes no se mencionan de forma expresa, aunque cabe suponer que, al tratarse de elementos de interés etnológico y etnográfico, quedan protegidos *per se* por los artículos 69¹⁰ y 74¹¹.

Tristemente, el paulatino abandono del campo y de sus formas de vida ha abocado a los palomares a convertirse en arquitectura relictual, como se aprecia en los de Vigaña (Fig. 34), en Grau, o en el de Casa Mariqueta (Fig. 35), en Tinéu, por citar sólo dos ejemplos. Al no cumplir hoy en día una función práctica en el ámbito de la economía agropecuaria, y debido también a sus modestas dimensiones, resulta difícil adaptarlos a otros usos.

Caso bien distinto es el de otras comunidades, donde la paloma forma parte de la cultura popular y continúa siendo un alimento de consumo habitual, lo que permite que los palomares se mantengan en uso. Prueba de ello es el proyecto “El palomar del abuelo” de la Residencia de Mayores de San Roque, en Villalón de Campos, provincia de Valladolid, donde se construyó en los jardines un palomar que funciona como criadero de palomas y centro de interpretación. Una loable iniciativa con la que sus gestores desean ofrecer un testimonio vivo de sus tradiciones y convertir el palomar en un lugar de encuentro que fomente lazos intergeneracionales entre los grupos de escolares que lo visitan y los mayores que allí conviven. Otro testimonio lo constituyen los palomares que denominamos históricos, como el ya citado de Gotarrendura (Fig. 36), en Ávila. En la visita a este palomar-museo es posible conocer no sólo los vínculos de santa Teresa de Jesús y su familia con esta construcción, sino también otros vestigios de interés de la localidad.



34



35

Figura 34: Palomar en Vigaña, Grau (Ayuntamiento de Grau)
Figura 35: Palomar de Casa Mariqueta, Pousada, Tinéu
Figura 36: Nidales de tierra prensada, interior del palomar de la familia Cepeda-Ahumada, Ávila (María Jesús Carravilla)



36



Figuras 37 y 38: Palomar en Samartín del Mar, Villaviciosa (Juan Pedrayes Obaya y Salvador Barro Pérez)
Figura 39: Palomar antes de su rehabilitación, Les Cuestes, Baña, Mieres (José Ramón Viejo)

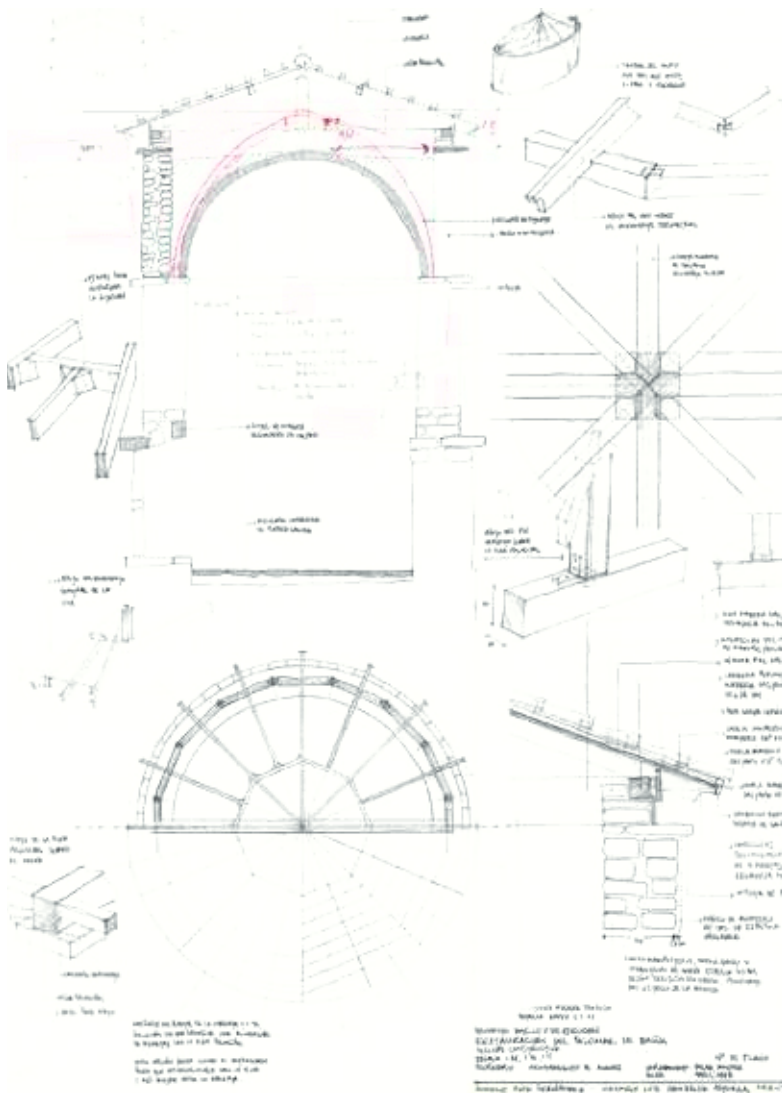
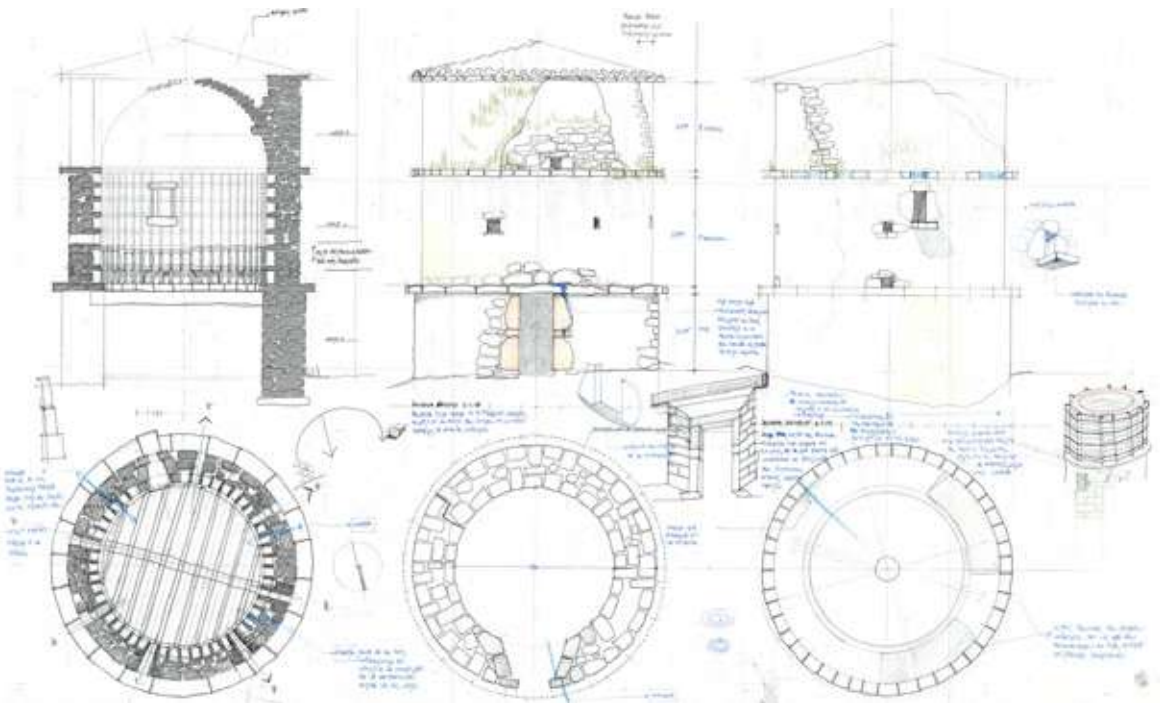
Aunque la práctica totalidad de los palomares asturianos ha perdido su función original y muchos han caído en el olvido y el abandono, algunos han despertado el interés de estudiosos y de personas sensibilizadas con el patrimonio etnográfico. Así, la Asociación de Vecinos de La Foz de Salceo diseñó un itinerario denominado “Ruta de los palomares”, que recorre distintas aldeas del concejo de Grau donde aún se conservan estas construcciones: Vigaña, Restiello, Santianes, Villamarín, Tolinas y Ambás, si bien la mayoría no presenta un estado óptimo de conservación.

Cabe reseñar que algunos palomares integrados en un conjunto arquitectónico notable suelen presentar un buen estado de conservación, ya que sus propietarios, tal como sucedía en tiempos pasados, los siguen considerando un elemento de distinción social, aunque hoy no sean más que objetos destinados a ornamentar o complementar el resto de la propiedad.

Un futuro posible para un patrimonio en el olvido

Los ejemplos documentados de palomares en abandono o ruina que hayan merecido la atención de particulares o instituciones son escasos. En 2002, el equipo de arquitectos formado por Juan Pedrayes Obaya y Salvador Barro Pérez presentó a la Consejería de Medio Ambiente del Principado de Asturias un hermoso e interesante proyecto para rehabilitar el palomar de La Rozada, ubicado en la localidad de Samartín del Mar (Figs. 37 y 38), en el concejo de Villaviciosa. La intención era recuperar su uso y, al mismo tiempo, convertirlo en observatorio ornitológico de la ría, emulando otras iniciativas como la surgida a mediados de la década de 1990 para estas construcciones en Villafáfila (Zamora) (Junta de Castilla y León [s. d.])¹². Sin embargo, la idea maliayesa no llegó a materializarse y el palomar se encuentra hoy en ruinas.

También merece citarse la rehabilitación que en 1998 llevaron a cabo los arquitectos Rogelio Ruiz Fernández y Macario Luis González Astorga en el palomar de Les Cuestes (Fig. 39), en Baña, propiedad del Ayuntamiento



Figuras 40: Dibujos, plantas y alzados, palomar de Baña, Mieres (Rogelio Ruiz Fernández y Macario Luis González Astorga)



Figura 41: Palomar rehabilitado, Baíña, Mieres (José Ramón Viejo)

de Mieres, cuyas obras fueron sufragadas por la Consejería de Cultura del Principado de Asturias. La simetría radial de la construcción permitió reconstruir con fidelidad las partes derruidas, reaprovechando en el proceso materiales que estaban arrumbados, tanto para restituir el último anillo del palomar como para la bóveda de media naranja de su interior, un elemento poco frecuente en estas edificaciones, que queda oculto al exterior por la cubierta (Figs. 40 y 41).

Conclusión

En la actualidad, los palomares siguen siendo grandes desconocidos de la etnografía asturiana y no despiertan en la sociedad la misma atención e interés que generan los hórreos, las paneras y los cabazos. Sin embargo, al igual que sucede con estas y otras arquitecturas tradicionales –como lagares, molinos, fraguas, ferrerías o mazos–, están ligados a los modos de vida y a la organización social de un territorio, configuran un paisaje y se hallan estrechamente vinculados al patrimonio cultural inmaterial. Por ello, consideramos urgente y necesaria la colaboración entre los distintos actores sociales –propietarios, asociaciones de vecinos, administración autonómica y profesionales especializados en la materia–, ya que profundizar en el estudio, la conservación y la difusión de estos bienes contribuye al enriquecimiento de nuestro patrimonio cultural¹³.

¹ Las referencias más antiguas a la arquitectura tradicional española se encuentran en *Agricultura General* del agrónomo y escritor Gabriel Alonso de Herrera (1470-1539) y en *Acerca de los secretos de agricultura, casa de campo y pastori* de fray Miguel Agustín (1570-1630), aunque las primeras descripciones verdaderamente detalladas aparecen en el siglo XVIII. El tratado asturiano posee un notable valor historiográfico, pues

estaba destinado al ámbito privado y familiar, y cubre un vacío de más de un siglo en los tratados de agronomía española.

² La comarca del Camín Real de la Mesa comprende los concejos de Belmonte de Miranda, Candamo, Grado, Las Regueras, Proaza, Santo Adriano, Somiedo, Teverga y Yernes y Tameza. La Montaña Central está integrada por Aller, Lena, Mieres, Morcín, Ribera de Arriba y Riosa; y la del Nora por Llanera, Noreña y Siero. En este trabajo se emplea indistintamente la toponimia en castellano y en asturiano.

³ El palomar de Cañe, situado a unos 37 m del palacio, tiene planta cuadrada de 4,12 × 4,57 m. La pared norte cuenta con 144 niales; la este, con 132; la oeste, también con 132; y la sur, con 116. Otro palomar, el de Carrió, fechado en el siglo XIX, perteneció a la familia Bernaldo de Quirós y es hoy propiedad de la Fábrica Tudela Veguín. De planta circular, presenta un diámetro interior de 6,30 m y muros de 75-78 cm de espesor; dispone de 644 niales distribuidos en 14 alturas, con nichos de 17-22 cm de ancho, 20-22 cm de alto y 36-39 cm de fondo.

⁴ El palomar cuenta con un aviadero perimetral de lajas de pizarra que sigue la inclinación del terreno, con los huecos de entrada para las palomas situados por debajo. La cría de palomas estuvo muy extendida en Santesteba, como lo evidencian los palomares existentes en la bajocubierta de muchas viviendas.

⁵ El término *sienna* designa un conjunto de hazas pertenecientes a una misma heredad.

⁶ Palomar exento, de planta circular, con 5,15 m de diámetro y cubierta cónica. La altura desde el suelo hasta el alero es de 3,20 m, y el espesor de los muros oscila entre 44 y 50 cm. El interior se divide en dos alturas mediante un piso de tablas apoyado en 14 vigas de madera dispuestas radialmente, de 2,41 a 2,87 m de largo, que descansan sobre un único pilar central de base cuadrada, también de madera. Los niales de los lados este y norte comienzan a 50 cm del suelo; los del oeste y sur, a 86 cm. La separación horizontal entre nichos varía entre 24 y 41 cm; la profundidad, entre 32 y 52 cm; la altura es de 22 cm y el ancho, de unos 23 cm. El suelo está formado por grandes lajas de piedra cubiertas con tierra pisada.

⁷ En otras áreas geográficas, donde los palomares son de mayores dimensiones y cuentan con un número elevado de niales, se utilizaba un ingenioso dispositivo de madera para coger huevos y pichones. Consistía en un eje central giratorio al que se unía una escalera, lo que permitía recorrer con facilidad el perímetro interior de la construcción. Algunos ejemplos quedaron reflejados en dibujos de Viollet-le-Duc, como el de Créteil, del siglo XIV, y otro en Nestlé, ambos en Francia.

⁸ En la provincia de León aún se conserva algún palomar con cubierta de paja, como el de Tombrío de Arriba, lo que permite suponer que en determinadas zonas de Asturias también se empleó este material, pues las cubiertas vegetales están documentadas en viviendas, graneros y cabañas de los concejos de Teverga, Ibias, Degaña, Tineo, Cangas del Narcea y Somiedo. Esta solución existió igualmente, aunque en tiempos lejanos, en Pravia, Lena, Quirós, Proaza y Miranda.

⁹ En 1997 este palomar se hallaba en ruinas y se describía como “una construcción de planta cilíndrica, de mampostería irregular, recorrida al exterior por dos impostas perimetrales: una a la altura del dintel de la puerta y otra en el arranque de la cubierta [...]. En el interior conserva un piso intermedio de madera que apoya en una única viga y en un retallo del muro. La pared está recorrida por nichos rectangulares, muy regulares, hechos con piedras apenas trabajadas. La cubierta es una tosca cúpula de mampostería unida con argamasa de barro”. Palomar de Baíña, Ficha del Inventario de Patrimonio Arquitectónico de Asturias (IPAA), Consejería de Cultura del Principado de Asturias, 3.

¹⁰ Artículo 69. 1. Integran el Patrimonio Etnográfico de Asturias las expresiones relevantes o de interés histórico de las culturas y formas de vida tradicionales de los asturianos, desarrolladas colectivamente y basadas en conocimientos y técnicas transmitidos consuetudinariamente, esencialmente de forma oral. 2. Se valorará, a efectos de su inclusión individualizada, cuando sus méritos así lo justifiquen, en alguna de las categorías, que a tal efecto, se establecen en la presente Ley, el interés etnográfico de los siguientes elementos: a) Los lugares que conservan manifestaciones de significativo interés histórico de la relación tradicional entre el medio físico y las comunidades humanas que los han habitado. b) Los lugares vinculados a tradiciones populares, ritos y leyendas

especialmente significativos. c) Las construcciones que manifiestan de forma notable las técnicas constructivas, formas y tipos tradicionales de las distintas zonas de Asturias. d) Los bienes muebles e inmuebles ligados a las actividades productivas preindustriales y protoindustriales, a las técnicas de caza y pesca y a las actividades artesanales tradicionales, así como los conocimientos técnicos, prácticas profesionales y tradiciones ligadas a los oficios artesanales.

¹¹ Artículo 74. 1. El Principado de Asturias y los Ayuntamientos procederán al estudio completo de los elementos de la arquitectura tradicional que individualmente tengan interés cultural o contribuyan de forma sustancial a configurar espacios que en conjunto lo tengan y a su inclusión en los catálogos urbanísticos de protección a que hace referencia el artículo 27, o a la aplicación de alguna de las restantes figuras de protección contempladas en la presente Ley. De esa forma se actuará en el caso de elementos que se encuentren en estado de ruina con objeto de promover su recuperación. 2. Cuando se produzca estado de ruina, o manifiesto abandono por un período superior a diez años, de elementos de interés etnográfico que hayan sido objeto de protección, el Ayuntamiento correspondiente tendrá la facultad de proceder a su expropiación. Efectuada la misma, se podrá realizar su transmisión a particulares, instituciones o entidades que se comprometan a garantizar la conservación de sus valores culturales. La misma facultad tendrá el Principado de Asturias cuando se trate de bienes declarados de Interés Cultural o incluidos en el Inventario del Patrimonio Cultural de Asturias.

¹² La Casa del Parque y Centro de Interpretación El Palomar, en la Reserva Natural Lagunas de Villafáfila (Zamora), se integra en un ecosistema de unas 23 hectáreas que cuenta con ocho observatorios ornitológicos, construidos siguiendo la tipología de los palomares locales, semejantes al del propio centro. Este se presenta como un gran palomar con más de 400 niales accesibles, que permite al visitante observar las aves sin ser visto, lo que permite preservar así su forma de vida.

¹³ Deseo expresar mi gratitud a mi marido, Fidel Araújo Ledo, así como a Pablo León Gasalla, Carmen Alonso Suárez, Ana Iglesias Fernández, Jesús Suárez López, Carlos Javier García Sánchez, Luis Manuel Martínez Rodríguez, Rodrigo Álvarez Brecht, Rogelio Ruiz Fernández y Macario Luis González Astorga, “Ástur” Paredes Rodríguez, Juan Pedrayes Obaya y Salvador Barro Pérez, Salomé Luengo Muñiz, Inmaculada Quintanal Sánchez (†), familia Vázquez de Prada, Belén Liste Menéndez, Grupo de Desarrollo Rural Alto Narcea Muniellos, P. Lázaro Sastre O.P., María Jesús Carravilla Parra, Sara López Hernández, Covadonga Buznego Vicente, Ramón Fernández-Mijares Sánchez, Residencia de Mayores San Roque de Villalón de Campos y Muséu del Pueblu d’Asturies. Muy especialmente, agradezco a *Journal of Traditional Building, Architecture and Urbanism*, que ha hecho posible la publicación de este artículo para rendir homenaje al fotógrafo y editor Alejandro Fernández Braña, quien me brindó la mayor parte de las imágenes que aquí se reproducen y que, tristemente, ya no se encuentra entre nosotros. A su memoria va dedicado este trabajo.

References | Referencias | Referências

Alonso de Herrera, Gabriel. 1819. *Agricultura General. Corregida según el texto original de la primera edición publicada en 1513 por el mismo autor y adicionada por la Real Sociedad Económica Matritense*. Madrid: Imprenta Real.

Castilla Pascual, Francisco Javier; Cejudo Loro, David; y Sánchez-Migallón Jiménez, Teodoro. 2020. Los palomares como elemento característico de la arquitectura tradicional de La Mancha, España. En *Journal of Traditional Building, Architecture and Urbanism*, 1: 447–462. <https://doi.org/10.51303/jtbau.vi1.370> (consultado el 04/12/2024).

Díez Anta, Santiago. 1993. *Los palomares en la provincia de León*. León: Caja España.

Ficha de Inventario de Patrimonio Arquitectónico de Asturias. Oviedo: Consejería de Cultura del Principado de Asturias.

Junta de Castilla y León. [s.f.]. *Casa de la Reserva “El Palomar”*. Zamora: Espacio Natural Lagunas de Villafáfila.

Jovellanos, Gaspar Melchor de. [s.f.]. *Cartas del viaje de Asturias*. [s.l.]: Álvaro Ruíz de la Peña y Elena de Lorenzo Álvarez.

Ley del Principado de Asturias de Patrimonio Cultural. 2001. Oviedo: Consejería de Cultura del Principado de Asturias.

Pumarada, Fray Toribio de Santo Tomás y. 2006 [1711–1714]. *Arte General de Grangerías: De las Grangerías Temporales*. Edición y estudio preliminar de López Álvarez, Juaco; transcripción de Priesca Balbín, María José; y Suárez López, Jesús. Salamanca-Gijón: Editorial San Esteban-Museo del Pueblo de Asturias.

Romera, Fernando; Carravilla, María Jesús; López, José María; Madrid, Carmen; y Muñoz, María Paz. 2015. El palomar teresiano de Gotarrendura: Evocaciones de la infancia de Santa Teresa en su experiencia mística. En Pérez Cuenca, María Isabel; Abradelo de Usera, María Isabel y Cid Vázquez, María Teresa (coords.), *Congreso Interuniversitario Santa Teresa de Jesús Maestra de vida*, 967-980. Ávila: Universidad Católica de Ávila.

Ruiz Fernández, Rogelio. 2004. Palombares. *Asturies memoria encesa d’un país*, 18: 70-78. Oviedo: Fundación Belenos.

Vander-Hammen y León, Lorenzo. 1627. *Don Juan de Austria: Historia*. Madrid: Alonso Pérez.

Viollet-Le-Duc, Eugène Emmanuel. 1854-1868. Colombier. *Dictionnaire raisonné de l’Architecture française du XI au XVI siècle*, 482-490. Paris: Bance-Morel.

Yebra de Ares, Antonio Benito. 2000. *Pazos y señoríos de la provincia de Lugo*. Lugo: Servicio de Publicaciones de la Diputación Provincial de Lugo.

Biography | Biografia | Biografia

María Prieto Vergara

Es licenciada en Geografía e Historia por la Universidad de Oviedo, en las especialidades de Historia e Historia del Arte. Actualmente desarrolla su tesis doctoral, titulada *Miguel Díaz y Negrete (1920-2011): un arquitecto para una ciudad*, bajo la dirección de Natalia Tielve García, catedrática del Departamento de Historia del Arte y Musicología de la citada universidad. En 2011 obtuvo el XIII Premio de Investigación y Divulgación “Rosario de Acuña” con el trabajo *Capillas populares y señoriales en el concejo de Gijón (Asturias)*, dirigido por la catedrática de Historia del Arte María Soledad Álvarez Martínez y publicado posteriormente por la Consejería de Educación, Cultura y Deporte del Principado de Asturias. Como resultado de su labor investigadora y docente en los campos de la arqueología, la arquitectura y el patrimonio etnográfico, ha publicado diversos trabajos, tanto en solitario como en colaboración, entre los que destacan *Trabajar para comer en la Asturias tradicional*, *Escudos de armas en el municipio de Gijón y Las capillas de ánimas en los concejos costeros del oriente del Principado de Asturias*.

Brandon R. Ro, Xavier Parareda

Exploring the Beauty of Tradition: How Fractal Geometry Influences Visual Attention in Architectural Design

La belleza de la tradición: Cómo influye la geometría fractal a la atención visual en el diseño arquitectónico

A beleza da tradição: Como a geometria fractal influencia a atenção visual no design arquitetônico

Keywords | Palabras clave | Palavras chave

Architectural complexity, Artificial intelligence, Neuroaesthetics, Pre-attentive vision, Eye-tracking simulation

Complejidad arquitectónica, Inteligencia artificial, Neuroestética, Visión preatentiva, Simulación del seguimiento ocular

Complexidade arquitetônica, Inteligência artificial, Neuroestética, Visão pré-atencional, Simulação de rastreamento ocular

Abstract | Resumen | Resumo

Traditional, classical, and vernacular architectural forms often exhibit fractal qualities that enhance aesthetic appeal and engage the human eye. This study explores whether the complexity and ornamentation found in traditional designs have measurable impacts on how people unconsciously perceive and visually engage with buildings. Through analyzing 28 facades generated with artificial intelligence, we calculated the fractal dimension of each one by the box-counting method. Unconscious visual attention was then predicted using eye-tracking emulation software to determine which fractal qualities capture most attention. Our results show a significant correlation: buildings with more fractality and organized visual complexity tend to capture more pre-attentive visual attention before viewer cultural associations come into play. These findings highlight the enduring appeal of the proportional complexity, fractal scaling, ornamentation, and intricate geometries found in traditional architecture. The fractal patterns inherent in traditional buildings may contribute to human visual experience, aesthetic appreciation, and psychophysiological health.

Las formas arquitectónicas tradicionales, clásicas y vernáculas a menudo poseen cualidades fractales que potencian el atractivo estético y captan la atención del ojo humano. En este estudio se analiza si la complejidad y la ornamentación de los diseños tradicionales tienen un impacto cuantificable en la manera en que las personas se sienten atraídas y perciben inconscientemente los edificios. Mediante el análisis de 28 fachadas generadas con inteligencia artificial, se calculó la dimensión fractal de cada una de ellas con el método del recuento de cajas o recuadros. A continuación, se predijo la atención

visual inconsciente utilizando un software de simulación del seguimiento ocular para determinar qué cualidades fractales captan más la atención. Los resultados muestran una significativa correlación: los edificios con una mayor fractalidad y una complejidad visual organizada suelen captar más la atención visual preatentiva antes de que entren en juego las asociaciones culturales del espectador. Estas conclusiones subrayan el atractivo permanente de la complejidad proporcional, la escala fractal, la ornamentación y las geometrías intrincadas características de la arquitectura tradicional. Los fractales inherentes a las construcciones vernáculas pueden contribuir a la experiencia visual, la apreciación estética y la salud psicofisiológica de las personas.

As formas arquitetônicas tradicionais, clássicas e vernáculas apresentam frequentemente qualidades fractais que aumentam o apelo estético e cativam o olhar humano. Este estudo explora se a complexidade e a ornamentação encontradas nos designs tradicionais têm um impacto mensurável na forma como as pessoas inconscientemente percebem e interagem visualmente com os edifícios. Através da análise de 28 fachadas geradas com inteligência artificial, calculamos a dimensão fractal de cada uma delas pelo método de contagem de caixas. A atenção visual inconsciente foi então prevista usando um software de emulação de rastreamento ocular para determinar que qualidades fractais captam mais atenção. Os nossos resultados mostram uma correlação significativa: edifícios com maior fractalidade e complexidade visual organizada tendem a captar uma maior percepção visual pré-atencional, antes que as associações culturais do observador entrem em jogo. Estas descobertas destacam o apelo persistente da complexidade proporcional, escala fractal, ornamentação e geometrias intrincadas encontradas na arquitetura tradicional. Os padrões fractais inerentes aos edifícios tradicionais podem contribuir para a experiência visual humana, a apreciação estética e a saúde psicofisiológica.

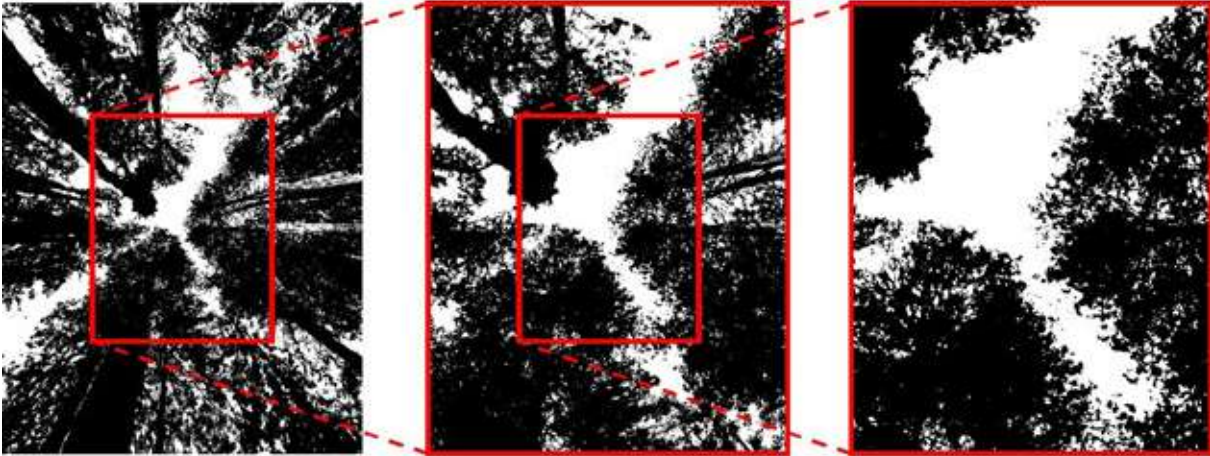
I. Introduction

Background and Research Question

Fractal geometry—patterns that repeat themselves on different scales—has been recognized as inherent in nature (Mandelbrot 1982). Fractals can be observed in the growth patterns of plants, especially when one looks up at the tree canopy (Fig. 1). Fractal patterns have also long been used to create visually complex and engaging architectural designs that resonate with human perception (C.B. Bovill 1996; Alexander 2002-2005; Nikos A. Salingaros 2013a). Various studies have proposed that complexity and novelty influence visual attention, aesthetic experience, and psychological responses (Daniel E. Berlyne 1971; Daniel E. Berlyne 1970; Silvia 2012).

While the aesthetic and psychological effects of fractal geometry have been acknowledged, there remains a gap in our understanding of the relationship between fractality in architecture and the visual attention it commands. Previous studies have suggested that higher fractal dimensions may enhance visual engagement and reduce physiological stress (Abboushi et al. 2019; Bies et al. 2016; Alexander Coburn et al. 2019; C.M. Hagerhall et al. 2008; C.M.P. Hagerhall et al. 2015; Nikos A. Salingaros 2012; R. Taylor 2006; R.P. Taylor and Spehar 2016; R.P. Taylor et al. 2005). Yet empirical evidence in the specific context of architectural facades is limited (Lee and Ostwald 2021, 2023; Lythgoe and Ro 2024).

Figure 1: Self-similar patterns recurring at different scales observable in Redwood trees seen from below



Objectives and Scope

Our aim is threefold: 1) to assess the fractal dimensions of building facades; 2) to evaluate the correlation between fractal complexity and visual attention; and 3) to test the hypothesis that architecture with higher fractal dimensions receives more visual attention. This hypothesis that facades with higher fractal dimensions will attract more attention connects with the idea that complexity enhances aesthetic engagement (Joye 2007; Nikos A. Salingaros and Sussman 2020). Our analysis concentrates on the effect of geometric complexity on unconscious visual attention rooted in biological brain mechanisms, intentionally excluding more conscious cognitive processes or the brain’s knowledge-meaning center linked to sociocultural variables such as education, semantic associations, personal experience, context, learned behavior, habitus, or symbols (Bourdieu 1977; Alex Coburn, Vartanian, and Chatterjee 2017; Geertz 1993; Mead and Métraux 2000). This limited scope is necessary to isolate the effects of fractal geometry on unconscious vision, but does not negate the importance of cultural and symbolic factors. Our findings are therefore to be seen as a contribution to an understanding of aesthetic perception rather than as an elucidation of holistic beauty.

We begin by reviewing the literature on fractal geometry in architecture, visual attention, and the use of artificial intelligence tools, identifying research gaps. Our methodology details the process of generating facades, calculating fractal dimension, and simulating visual attention. The last two sections present our results and discuss their implications for architectural design, together with their limitations and possible directions for future research.

Literature Review

Fractal Geometry in Architecture

Fractal characteristics appear in self-similar patterns and scalable complexity in architectural forms. Pioneering theory has noted that many beloved traditional structures exhibit fractal scaling, such as proportional similarities, geometric repetition, and other fractal patterns to be seen in the intricate designs of Hindu temples, Islamic mosques, Gothic cathedrals, traditional Turkish housing, or Palladian villas (Trivedi 1989; Samper and Herrera 2014; Lee and Ostwald 2024; Pudine 2015; C.B. Bovill 1996; Aykal, Erbaş Özil, and Hizar 2020; Okuyucu and Baştaş 2023).

The fractal nature of classical orders can be seen in the relative proportions of a temple front and molded column capitals (Fig. 2). Other studies have explored how these fractal relationships contribute to the overall harmony and beauty of classical architecture (C. Bovill 2008; Capo 2004; Crompton 2002). The “classical visual arts,” which according to Mandelbrot include Beaux Arts architecture, are fractal in character. These arts “involve very many scales of length and favor self-similarity” and “imitate Nature”; thus “fractal art is readily accepted because it is not truly unfamiliar” (Mandelbrot 1982: 23; 2007). Hence the visual richness associated with traditional ornamentation and patterns is thought to stimulate the eye and mind in a similar manner (C.M. Hagerhall et al. 2008; Nikos A. Salingaros 2012).

By comparison, a minimalist “Bauhaus style, glass cube-type building” by Mies Van der Rohe would be considered “scalebound,” since its “characteristic elements of scale,

such as length and width, are few in number and each with a clearly distinct size.” But a Beaux Arts building, such as Charles Garnier’s Paris opera house, has scaling with “many different elements whose scales are of any imaginable size... depending upon the viewing points of beholders” (Mandelbrot 2007: 45-46). Thus, rich fractal patterns can contribute to aesthetic appeal and cultural significance (Aisyah, Noerwasito, and Novianto 2023; C.B. Bovill 1996).

Measuring Fractals and Visual Preference

The intersection of ordered complexity and human perception is addressed by the fields of neuroaesthetics and neuroarchitecture (Eberhard 2014, 2009). These explore how design elements such as fractals can affect psychological well-being and cognitive responses (Robinson and Pallasmaa 2015; Zeisel 2006; Ruggles 2017; Sussman and Hollander 2015). Contemporary studies have quantified visual complexity in architecture by measuring fractal dimensions using the box-counting method (C.B. Bovill 1996; Ostwald and Vaughan 2016). This gauges the complexity of a pattern by counting the number of boxes of a given size needed to cover that pattern (Fig. 3) and offers a numerical value representing its fractal dimension (D). Previous studies have used this technique to analyze the complexity of natural and man-made environments so as to

determine the extent to which fractal geometry contributes to visually engaging designs (Vaughan and Ostwald 2010; Pudine 2015; C.B. Bovill 1996).

Fractal analysis of a building aims to provide “a quantifiable measure of the progression of detail” (C.B. Bovill 1996: 127). Some studies suggest that images with mid-range fractal dimensions ($D = 1.3$ to 1.5) are aesthetically preferred because they offer a balance between order and complexity, as mid-range fractals align with patterns in nature which we find soothing (C.M. Hagerhall et al. 2008; C.M.P. Hagerhall et al. 2015; Nikos A. Salingaros 2012; Spehar et al. 2003; R. Taylor 2006; R.P. Taylor and Spehar 2016; R.P. Taylor et al. 2005; Joye 2007). Other studies have found that humans also prefer higher fractal dimensions ($D = 1.5$ to 1.7) for indoor environments (Abboushi et al. 2019) or when viewing exact (mathematical) fractal forms (Bies et al. 2016; Robles et al. 2020). What is unknown at present is what levels of fractality are preferred for building facades.

Visual Attention in Architectural Design

Visual attention is critical to architectural design, as part of how we perceive and interact with our environment. Research has shown that environments with higher levels of visual complexity, such as those with fractal patterns,

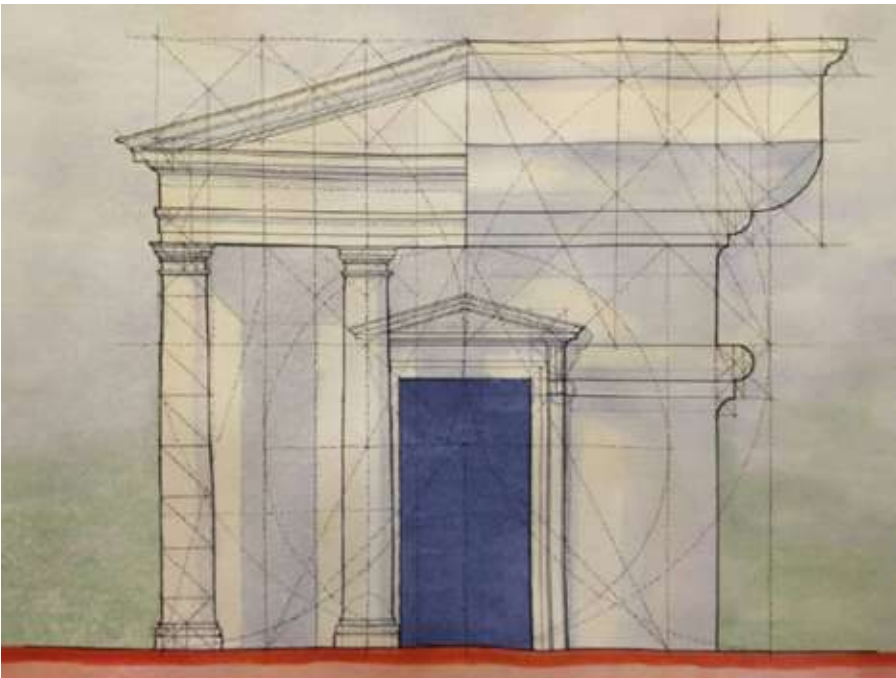


Figure 2: Classical architecture is fractal due to self-similar patterns and proportions that recur at different scales

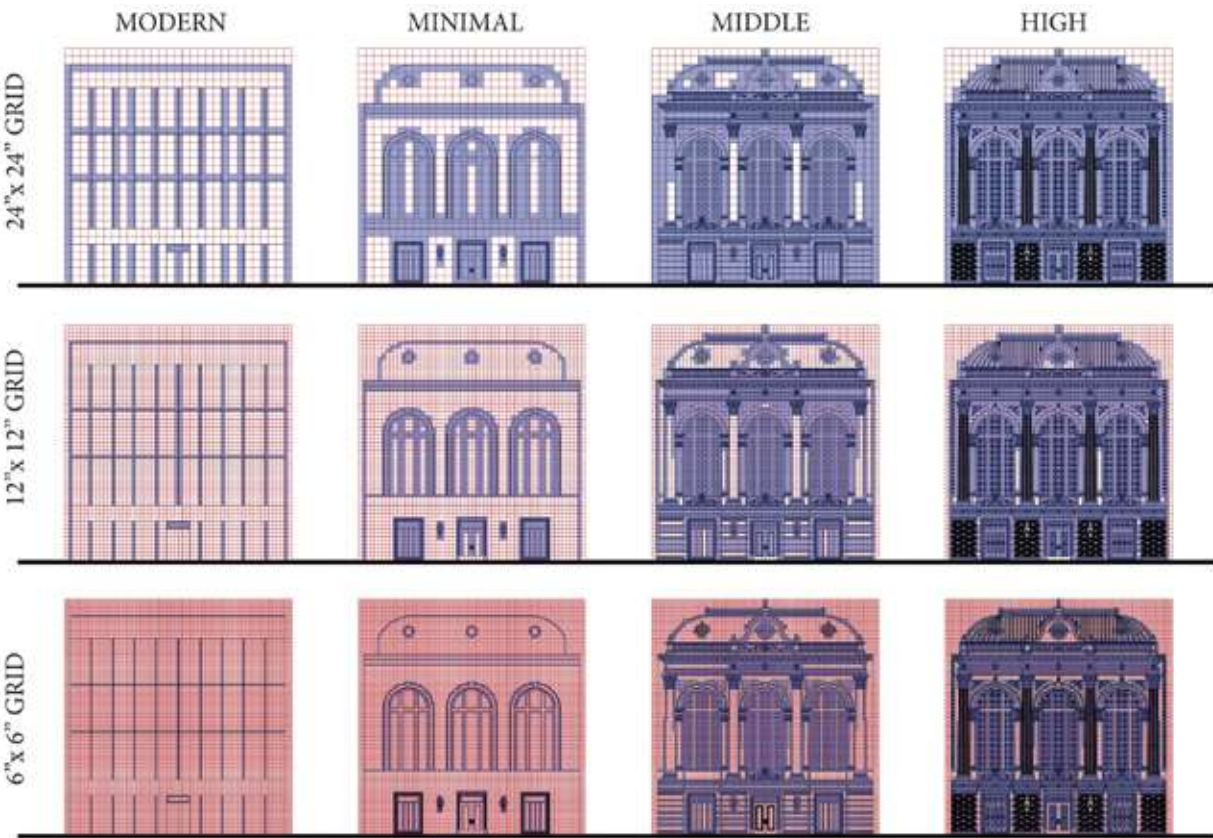


Figure 3: Box counting for fractal dimension estimation using three box sizes overlaid on facades. Fractal Dimension = $1 < D < 2$ (Joshua Lythgoe)

are more likely to capture and sustain attention (Ro and Huffman 2024; Rosas et al. 2023; Daniel E. Berlyne 1971; Heath, Smith, and Lim 2000). Studies using eye-tracking technology have also provided insights into how architectural elements, materials, and shapes guide visual focus during aesthetic experience (Hollander et al. 2020; Sussman and Hollander 2015; Nikos A. Salingaros and Sussman 2020; Rosas et al. 2023; Lavdas, Salingaros, and Sussman 2021). The advent of eye-tracking emulation tools has further advanced understanding of these dynamics in architecture by predicting focuses of attention without requiring live subjects (Lavdas, Salingaros, and Sussman 2021; 3M 2023; Lavdas and Salingaros 2022; Ro and Huffman 2024). This body of work generally suggests that architectural scenes rich in edges, contrasts, and hierarchical detail tend to draw the eye more effectively. This aligns with the belief that our gaze is attracted to moderate complexity and informational richness.

Artificial Intelligence in Architectural Analysis

The integration of artificial intelligence (AI) into architectural design has opened new possibilities for creating complex patterns (Jacobus and Kelly 2023; Leach 2022; Ro 2025, forthcoming). AI generative tools can quickly produce architectural forms with varying levels of fractal complexity which researchers and designers may use to explore aesthetic outcomes. In similar fashion, AI diagnostic tools are increasingly employed to consider how these forms impact visual attention and user experience. For instance, 3M’s Visual Attention Software (3M-VAS) is trained on biometric data to mimic human pre-attentive vision with a claimed 92% accuracy. It functions as a kind of “visual spellcheck”, predicting which areas of an image are likely to be noticed in the first 3-5 seconds of viewing (3M 2010, 2023). The application has been tested on design elements with the aim of enhancing visual engagement and even improving psychological well-being by guiding attention (Lavdas, Salingaros, and Sussman 2021; Nikos A. Salingaros and Sussman 2020). AI tools can help architects design not “anxiety-inducing structures” but biologically based objective beauty (Nikos A Salingaros 2022; Lavdas, Mehaffy, and Salingaros 2023; Lavdas and Salingaros 2022). Such tools enable optimization of design to suit the way humans process visual information. Thus this study leverages AI both to generate stimuli (facades)

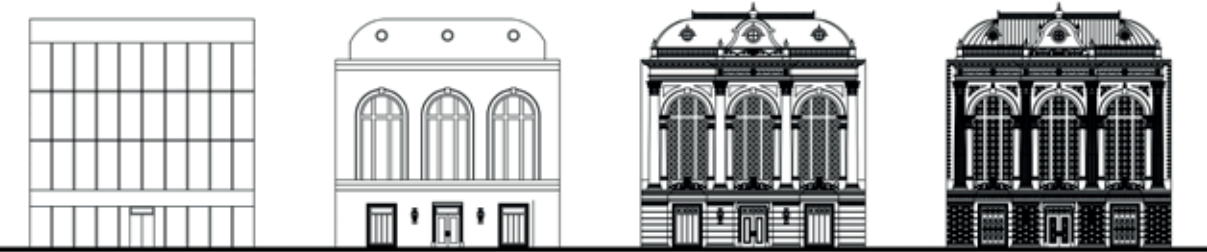


Figure 4: Original facades used to create AI-generated designs (Joshua Lythgoe)

and to simulate visual attention. We remain mindful that these techniques model only certain aspects of aesthetic perception, not the whole embodied architectural experience.

Gaps in Existing Literature

Despite advances in the understanding of fractal geometry and visual attention in architecture, there is a need for empirical studies that directly link these concepts. Previous studies have analyzed only a limited number of buildings, which makes their findings hard to generalize. Additionally, methodological limitations persist in how fractality is measured. For example, some architectural studies have used too few box sizes or unconventional scaling steps that can undermine accuracy (Lee and Ostwald 2021, 2023; Lythgoe and Ro 2024; C.B. Bovill 1996).

This new study aims to address these gaps by analyzing the relationship between fractal dimension and visual attention across a larger set of systematically varied building facades. We use a broader and more systematic range of box sizes to improve measurement of fractality in architectural images. By employing an AI visual attention prediction tool, we build on previous research while refining the methodology for understanding why building facades with higher fractal dimensions may attract more visual attention (Lee and Ostwald 2021, 2023; Lythgoe and Ro 2024).

Methodology

AI-Generated Facades

To explore the relationship between fractality and visual attention, building facades were generated using the AI image generator Midjourney (version 6.1). A series of four facades of varying complexity from a prior study (Fig. 4) were used to guide the AI prompts (Lythgoe and Ro 2024). Three of the original four facades follow a traditional design technique called “progressive omission” in which classical orders, moldings, and details are first applied to a building elevation and then incrementally removed (Adam 1990: 138-141). The fourth facade was a minimalist modern design. The four complexity levels for the AI images included the following prompts:

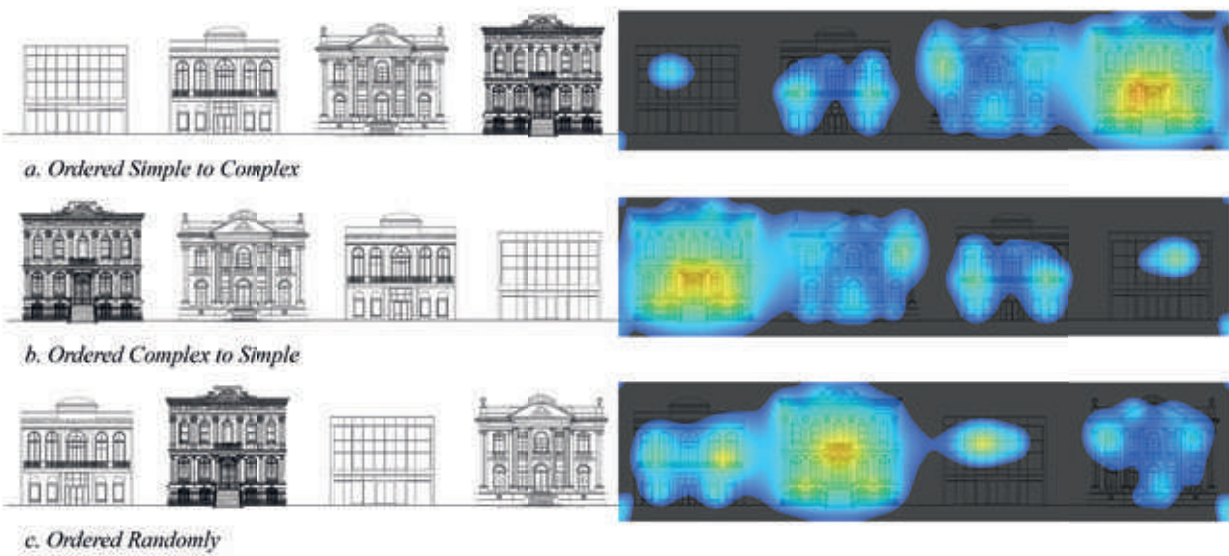


Figure 5: Exploration of left-to-right bias with 3M VAS heatmaps using different ordering

1. A (very) (simple) black and white schematic of a (minimalistic) modern (building/apartment block/ mansion)
2. A (very) simple black and white schematic of a (front elevation of a) (beautiful) (building/apartment block)
3. A simple black and white schematic of a (front elevation of a) beautiful (classical/1800s/1900s/1910s) (building/apartment block)
4. A detailed black and white schematic of a (front elevation of a) (1800s/1900s/1910s) beautiful (building/apartment block)

As a result, 28 unique facades were generated, with four different ones at each level of complexity: 1) modern minimalistic; 2) bare classical with minimal ornament; 3) classical with moderate ornament; and 4) detailed ornate classical. This yielded a diverse set of facades that could be systematically analyzed for both fractal dimension and visual attention score.

The 28 facades were arranged into seven distinct groups, each containing one building from each complexity level (1 through 4). The facades in each group montage (Figs. 6-12) were arranged left to right from level 1 (Modern) to 4 (Detailed Classical) with increasing complexity, providing a clear framework for comparison across groups.

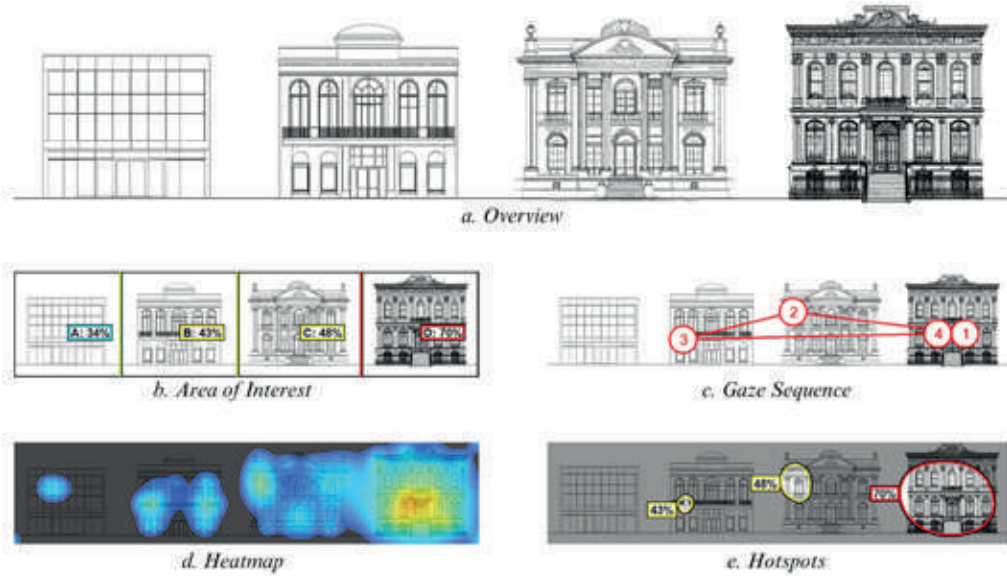


Figure 6: Building group 1

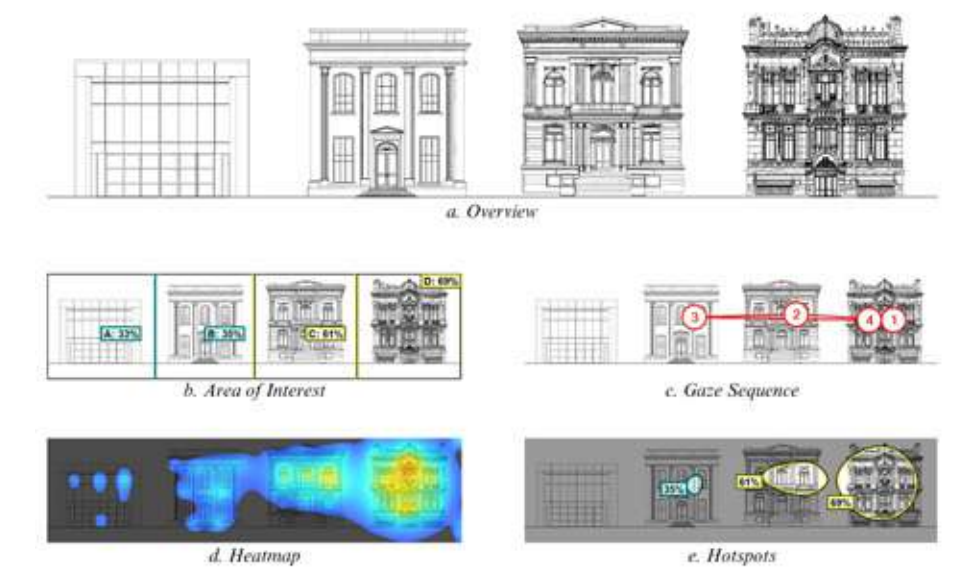


Figure 7: Building group 2

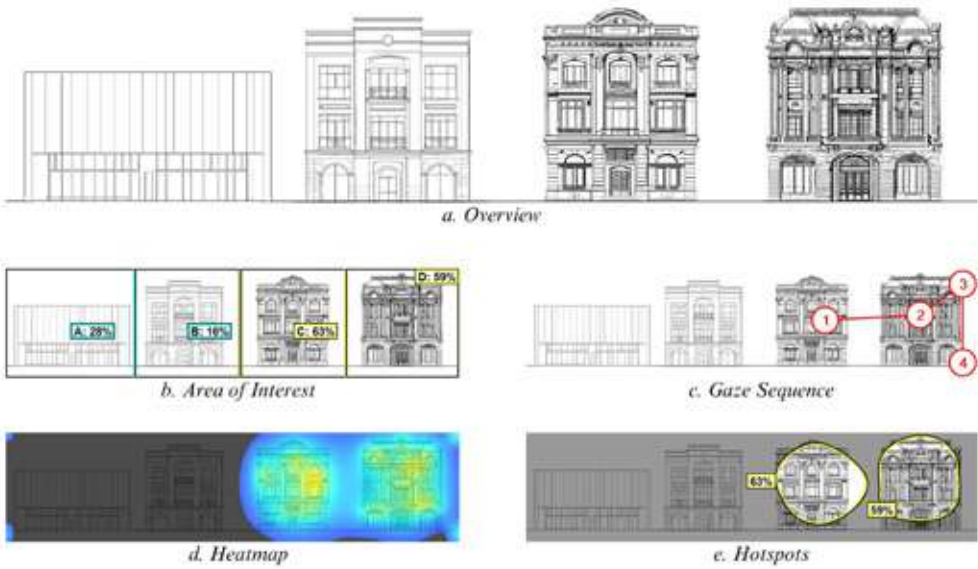


Figure 8: Building group 3

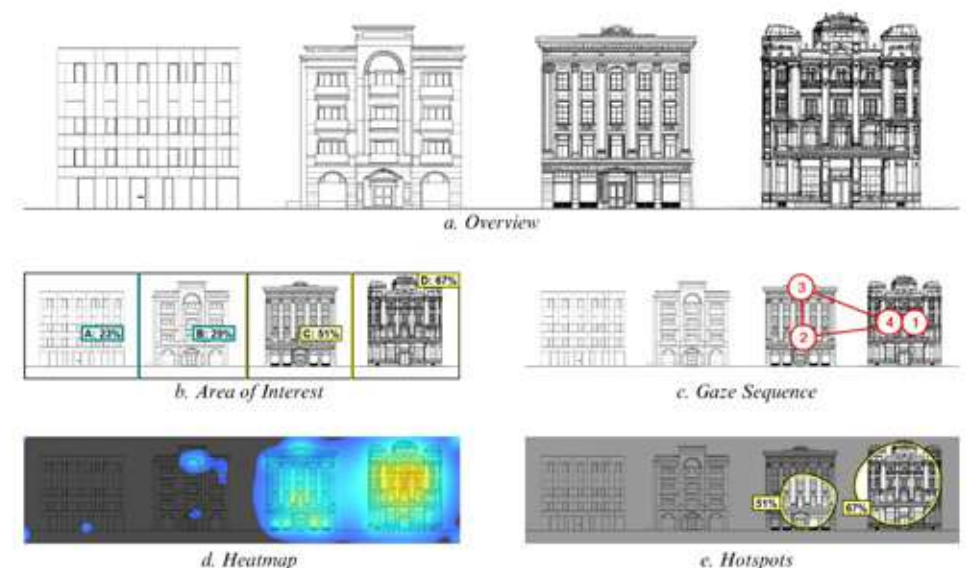


Figure 9: Building group 4

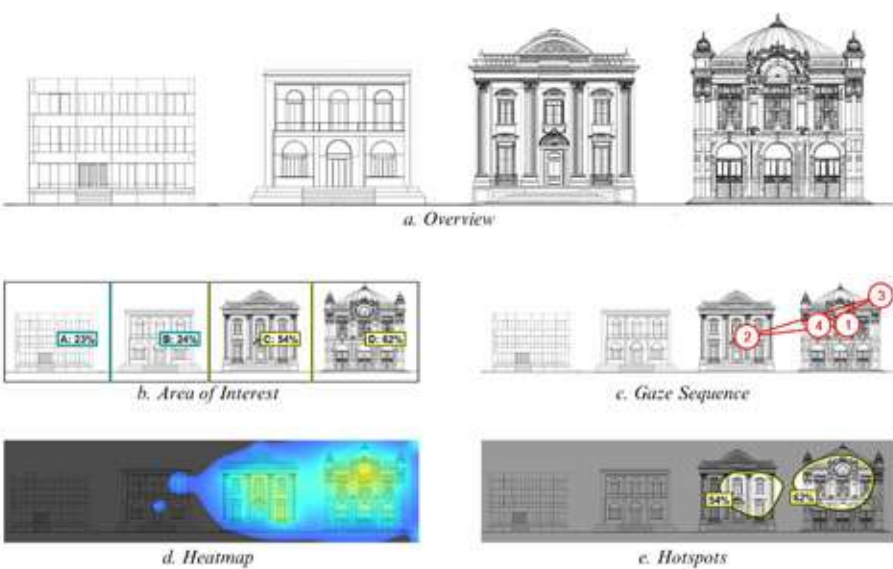


Figure 10: Building group 5

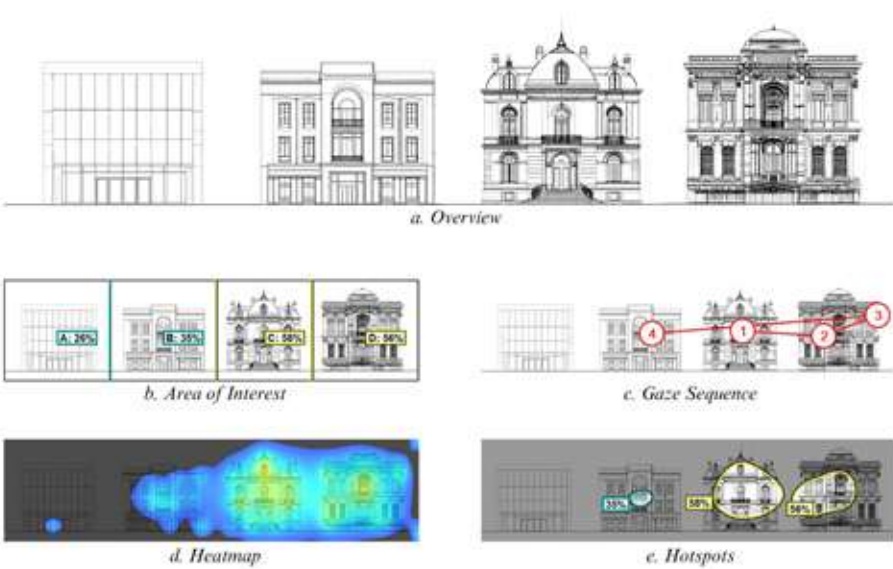


Figure 11: Building group 6

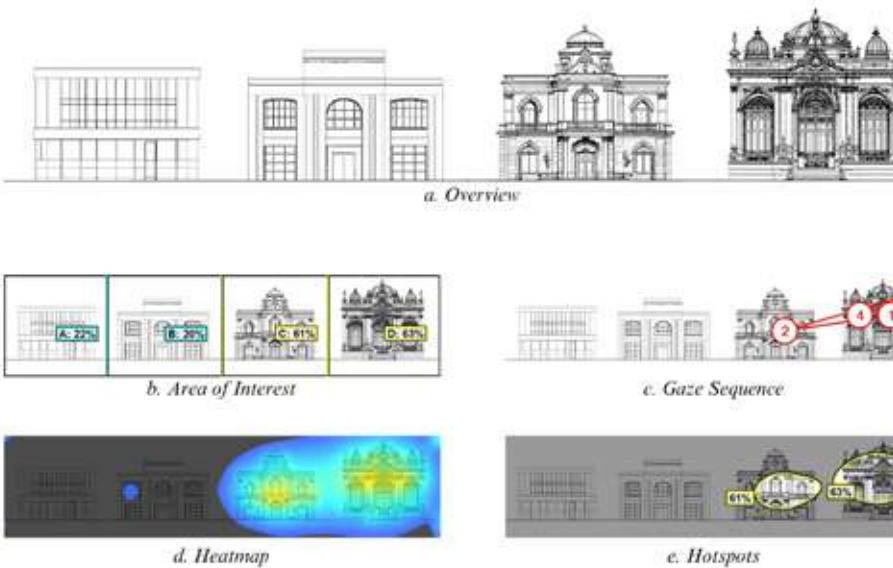


Figure 12: Building group 7

We recognize that this arrangement, or alternatives such as random order or grouping by style, could influence patterns of visual attention and introduce bias. In particular, a fixed left-to-right layout or viewers’ native reading direction might encourage them (or the 3M-VAS algorithm) to favor one side of the sequence, as seen in other studies (Foulsham, Frost, and Sage 2018; A.K. Smith et al. 2015).

To assess this possibility, we conducted a brief secondary analysis using different orderings for building group 1: a. simple to complex; b. complex to simple; and c. randomized (Fig. 5). This showed no evidence of systematic left/right bias, but reading direction or presentation order could indeed influence scanning behavior. We prioritized clarity and comparability with a fixed order, but future research should randomize image positions or rotate layouts across trials. This would help disentangle the effects of facade complexity from sequencing effects and further test whether cultural directionality influences visual attention.

Fractal Dimension Calculation with ImageJ

The box-counting method is a well-established way of quantifying the complexity of fractal patterns in nature (Mandelbrot 1982), art (Spehar et al. 2003), and architecture (Vaughan and Ostwald 2010; C.B. Bovill 1996). It involves laying a grid of boxes of varying sizes over an image and counting the boxes that contain part of the pattern (Fig. 3). In our case, “the counted boxes represent the areas of the façade where there is something to look at” (C.B. Bovill 1996: 123). The fractal dimension is then derived from the correlation between the box size and the number of occupied boxes. The box-count fractal dimension (D) is expressed mathematically:

$$D = \lim_{\epsilon \rightarrow 0} \frac{\log(N(\epsilon))}{\log(1/\epsilon)}$$

Where D is the fractal dimension, ϵ is the size of the boxes or grid cells, and $N(\epsilon)$ is the number of boxes needed to cover the object at scale ϵ (Barnsley 1993). The slope of the linear regression line in a log-log plot through the data points represents the fractal dimension (D). This ranges as a fractional value between 1 and 2 ($1 < D < 2$). Thus a simple object that is scalebound—containing few elements—will have a fractal dimension value close to 1. A more complex object with diverse scaling elements will have a fractal dimension approaching 2.

We used ImageJ’s default box sizes (2, 3, 4, 6, 8, 12, 16, 32, 64) to calculate the fractal dimensions of each facade. We included both powers of 2 as well as non-powers of 2 to capture intermediate steps of scaling, detect anomalies, and comprehensively cover non-fractal features. Our method deviates from previous architectural studies, which often relied on only three box sizes or used unconventional scaling steps, such as the golden ratio (Lee and Ostwald

2021, 2023; Lythgoe and Ro 2024). Limited box sizes may restrict accuracy, especially where the subject buildings do not follow a uniform scaling system. For instance, classical buildings frequently have a variety of proportions within a single design (1:1, 1:1.618, 1:2, 1:4, 2:3, 3:4, etc.), while other styles such as Romanesque or Gothic may incorporate more complex ratios (1:√2, 1:√3, etc.). Applying scaling such as the golden ratio across diverse architectural styles may thus obscure nuances of proportion. Our expanded selection of box sizes offers a more versatile and accurate analysis across styles.

In ImageJ, we converted each facade image to grayscale and auto-adjusted the threshold prior to the analysis. The software provides a log-log plot of box size versus count, number of boxes, and fractal dimension. The latter provided a numerical measure of each facade’s fractality represented by a D -value. The 28 facades were independently tested to determine each fractal dimension. As defined in other studies, “ D is taken as a measure of the aesthetic character of visual attraction, i.e. visual complexity” (Lee and Ostwald 2023: 44).

Visual Attention Prediction – Eye-Tracking Emulation

Visual attention was predicted using eye-tracking emulation with 3M’s Visual Attention Software (3M-VAS) to determine which facade may attract most pre-attentive vision before age, gender, culture, and education come into play (Lavdas, Salingaros, and Sussman 2021; 3M 2023). This software simulates human visual behavior by predicting how elements may attract and hold attention on an unconscious level, providing insights into how facades will likely be perceived in the real world (Hollander et al. 2020; Nikos A. Salingaros and Sussman 2020).

Each of the seven groups of facades discussed above were tested using 3M-VAS. Each group of four, of differing complexity, was evaluated by pairwise comparison based on the results of the four 3M-VAS reports (Figs. 6-12), namely:

- Heatmap: A 3M-VAS heatmap shows areas that are likely to be noticed within the first 3-5 seconds and uses color intensity to indicate areas of visual interest. We used ImageJ to create a Region of Interest (ROI) by tracing each facade’s outline and measuring the percentage of heatmap coverage. This combined use of 3M-VAS and ImageJ has been validated by recent research assessing visual engagement with architectural images (Lavdas and Salingaros 2022, 13; Ro and Huffman 2024).
- Hotspots: 3M-VAS hotspots are key areas on an image that are likely to attract attention. Our study regards facades with any hotspot region as more visually engaging. As in previous studies, a building with a

higher hotspot percentage within an image group is seen as having a more engaging facade (Ro and Huffman 2024).

- Gaze Sequence: The 3M-VAS gaze sequence is the order of the first four locations a viewer is likely to notice. Our study regards facades that capture one or more of these locations early in the sequence as successful in attracting unconscious visual attention. Each gaze sequence location on a building is tallied as 25 percentage points, as in an earlier study (Ro and Huffman 2024).
- Areas of Interest: A 3M-VAS area of interest (AOI) is a focal area around a subject whose likelihood of being seen at first glance is measured. Areas are scored on the basis of visual elements such as edges, contrasts, and intensity. Our study used a rectangular outline for each facade, like earlier studies (Ro and Huffman 2024). A higher AOI score indicates a greater chance of attracting attention.

As in a previous study (Ro and Huffman 2024), the mean percentage score of all four 3M-VAS reports ($\Sigma\text{VAS}/4$) was tabulated to create a “visual attention coherence” (VAC) score. This single value summarizes a facade’s overall ability to attract visual attention. A higher VAC score means that the building consistently draws attention across multiple measures. The VAC score is also designed to facilitate comparison within each group of four facades, since each group’s VAC values indicate a ranking of attention capture by degree of complexity.

All 3M-VAS analyses were done in batches with identical contextual parameters (image size, analysis settings, background, absence of distractors) to ensure comparability. It is important to note that 3M-VAS predicts a pre-attentive or unconscious visual attention response, like an unthinking first glance, rather than appreciation or prolonged attention which could be influenced by recognition or meaning.

Statistical Analysis

The relationship between fractal dimension and visual attention was statistically analyzed across the dataset. We first examined simple correlations. Pearson’s correlation coefficient was calculated between each facade’s D -value and VAC score to quantify correlation strength and direction. Next, we performed regression analysis to explore the predictive power of fractal dimension (D) on visual attention (VAC). Given the grouped nature of the data (seven independent groups of facades), we also qualitatively checked within-group trends. The statistical analysis was conducted with standard tools such as Jamovi 2.4, using R language, to ensure robustness and reliability of results. The significance level was set at $\alpha = 0.05$ for

hypothesis testing. We reported correlation coefficients (r) along with p -values and regression R^2 values to indicate the proportion of variance in attention attributable to fractality. We also computed basic descriptive statistics (means and standard deviations) of D and VAC for each complexity category (1 through 4) to supplement the group results.

Results

Building Group Findings

Across all seven building groups, a consistent pattern emerged: facades with more fractal complexity (higher D) received higher predicted visual attention coherence (VAC) scores. In each group, the “Detailed Classical” (Level 4) facade achieved the highest values on all visual attention metrics, reflecting significant visual engagement. Meanwhile, the “Modern” (Level 1) facade consistently captured the least visual attention. The “Classical” (Level 3) and “Bare Classical” (Level 2) facades fell in between, generally following the complexity hierarchy. There follows a brief overview of results for each building group.

Building Group 1

The 3M-VAS reports and fractal dimensions (D) for the four levels of complexity in building group 1 (Table 1) show that the “Detailed Classical” facade consistently outperforms the others across all categories (Fig. 6). The high visual attention coherence score (72.5%) suggests strong visual engagement and attention capture. This is further supported by the highest fractal dimension score in the group ($D = 1.83$), indicating rich visual complexity.

In contrast, the “Modern” facade attracts least attention with only partial heatmap coverage (13.7%) and no hotspots or gaze sequence locations. This results in the lowest overall coherence score (11.9%), with the lowest fractal dimension ($D = 1.39$). The “Bare Classical” and “Classical” facades come next with moderate levels of visual attention and fractal complexity. These findings indicate a clear correlation between greater fractality and increased visual attention for building group 1. Detailed classical facades appear to consistently capture more viewer interest than less detailed ones.

Building Group 2

The results for group 2 (Fig. 7; Table 2) mirror those of group 1. “Detailed Classical” again comes first in both coherence (72%) and fractal dimension ($D = 1.79$), while “Modern” ranks lowest (coherence 12.6%, $D = 1.37$). The intermediate “Bare Classical” and “Classical” facades show the same trend of increasing attention with higher complexity ($D = 1.55$ – 1.70).

VAS Report Category	1. Modern	2. Bare Classical	3. Classical	4. Detailed Classical
VAS1 – Heatmap (ImageJ coverage)	13.7%	66.9%	96.3%	100%
VAS2 – Hotspots (probability region score)	0%	43%	48%	70%
VAS3 – Gaze sequence (locations)	0%	25%	25%	50%
VAS4 – Area of interest (probability score)	34%	43%	48%	70%
Visual attention coherence score (Σ VAS/4)	11.9%	44.5%	54.3%	72.5%
Fractal dimension (D)	1.36	1.58	1.67	1.83

Table 1. Summary of fractal dimension and VAS report findings for building group 1

VAS Report Category	1. Modern	2. Bare Classical	3. Classical	4. Detailed Classical
VAS1 – Heatmap (ImageJ coverage)	17.2%	71.7%	77.8%	99.9%
VAS2 – Hotspots (probability region score)	0%	35%	61%	69%
VAS3 – Gaze sequence (locations)	0%	25%	25%	50%
VAS4 – Area of interest (probability score)	33%	35%	61%	69%
Visual attention coherence score (Σ VAS/4)	12.6%	41.7%	56.2%	72%
Fractal dimension (D)	1.37	1.55	1.70	1.79

Table 2. Summary of fractal dimension and VAS report findings for building group 2

VAS Report Category	1. Modern	2. Bare Classical	3. Classical	4. Detailed Classical
VAS1 – Heatmap (ImageJ coverage)	0%	0%	100%	100%
VAS2 – Hotspots (probability region score)	0%	0%	63%	59%
VAS3 – Gaze sequence (locations)	0%	0%	25%	75%
VAS4 – Area of interest (probability score)	28%	16%	63%	59%
Visual attention coherence score (Σ VAS/4)	7.0%	4.0%	62.8%	73.3%
Fractal dimension (D)	1.26	1.48	1.69	1.78

Table 3.Summary of fractal dimension and VAS report findings for building group 3

Building Group 3

Group 3 (Fig. 8; Table 3) follows the same pattern, with “Detailed Classical” coming first (73.3%, D = 1.78) and “Classical” in second place (62.8%, D = 1.69). Notably, both “Modern” and “Bare Classical” scored very low in coherence (7.0% and 4.0%). “Bare Classical” unexpectedly underperformed despite a higher fractal dimension (D = 1.48) than “Modern” (D = 1.26).

Building Group 4

Group 4 follows the same trend (Fig. 9; Table 4). “Detailed Classical” (71.0%, D = 1.80) and “Classical” (63.0%, D = 1.72) dominate the attention metrics, with “Modern” (6.1%, D = 1.33) and “Bare Classical” (11.4%, D = 1.52) far behind. The 3M-VAS heatmaps show stark contrasts in coverage between ornate and simple designs.

Table 4. Summary of fractal dimension and VAS report findings for building group 4

VAS Report Category	1. Modern	2. Bare Classical	3. Classical	4. Detailed Classical
VAS1 – Heatmap (ImageJ coverage)	1.2%	16.4%	99.9%	100%
VAS2 – Hotspots (probability region score)	0%	0%	51%	67%
VAS3 – Gaze sequence (locations)	0%	0%	50%	50%
VAS4 – Area of interest (probability score)	23%	29%	51%	67%
Visual attention coherence score (Σ VAS/4)	6.1%	11.4%	63.0%	71.0%
Fractal dimension (D)	1.33	1.52	1.72	1.80

VAS Report Category	1. Modern	2. Bare Classical	3. Classical	4. Detailed Classical
VAS1 – Heatmap (ImageJ coverage)	0%	12.4%	99.2%	100%
VAS2 – Hotspots (probability region score)	0%	0%	54%	62%
VAS3 – Gaze sequence (locations)	0%	0%	25%	75%
VAS4 – Area of interest (probability score)	23%	24%	54%	62%
Visual attention coherence score (Σ VAS/4)	5.8%	9.1%	58.1%	74.8%
Fractal dimension (D)	1.34	1.43	1.69	1.75

Table 5. Summary of fractal dimension and VAS report findings for building group 5

VAS Report Category	1. Modern	2. Bare Classical	3. Classical	4. Detailed Classical
VAS1 – Heatmap (ImageJ coverage)	3.6%	66.9%	100%	99.8%
VAS2 – Hotspots (probability region score)	0%	35%	58%	56%
VAS3 – Gaze sequence (locations)	0%	25%	25%	50%
VAS4 – Area of interest (probability score)	26%	35%	58%	56%
Visual attention coherence score (Σ VAS/4)	7.4%	40.5%	60.3%	65.5%
Fractal dimension (D)	1.30	1.55	1.66	1.77

Table 6. Summary of fractal dimension and VAS report findings for building group 6

Building Group 5

Group 5 sees a similar pattern (Fig. 10; Table 5). “Detailed Classical” has full heatmap coverage (100%), high coherence (74.8%), and a high fractal score (D = 1.75). “Classical” also scores high (99.2% coverage, 58.1%, D = 1.69). “Modern” (5.8%, D = 1.34) and “Bare Classical” (9.1%, D = 1.43) remain the least engaging.

Building Group 6

Much like groups 1 and 2, group 6 (Fig. 11; Table 6) suggests that simple forms and less complex geometry struggle to attract and sustain viewer attention compared to more detailed and complex designs. “Detailed Classical” (65.5%, D = 1.77) and “Classical” (60.3%, D = 1.66) show strong results, whereas “Bare Classical” scores moderately

VAS Report Category	1. Modern	2. Bare Classical	3. Classical	4. Detailed Classical
VAS1 – Heatmap (ImageJ coverage)	0%	3.7%	100%	100%
VAS2 – Hotspots (probability region score)	0%	0%	61%	63%
VAS3 – Gaze sequence (locations)	0%	0%	25%	75%
VAS4 – Area of interest (probability score)	22%	20%	61%	63%
Visual attention coherence score (Σ VAS/4)	5.5%	5.9%	61.8%	75.3%
Fractal dimension (D)	1.24	1.46	1.65	1.77

Table 7. Summary of fractal dimension and VAS report findings for building group 7

(40.5%, $D = 1.55$) and “Modern” again shows the weakest visual engagement (7.4%, $D = 1.30$).

Building Group 7

Group 7 (Fig. 12; Table 7) follows the same hierarchy but with a notable near-tie in hotspots and AOI scores between “Detailed Classical” (75.3%, $D = 1.77$) and “Classical” (61.8%, $D = 1.65$). “Modern” (5.5%, $D = 1.24$) and “Bare Classical” (5.9%, $D = 1.46$) both attract little attention despite the latter’s higher complexity. Thus more complex architectural forms and detailing are significantly more successful at capturing visual attention as compared to simpler designs.

Fractal Dimension Results

The analysis of the 28 facades revealed a wide range of fractal dimensions (D), reflecting diverse visual complexity, from 1.24 to 1.83 (see Table 8). As expected, facades with more intricate scalable patterns exhibited greater fractality. This is consistent with the principles of fractal geometry, involving self-similar detail across various scales (C.B. Bovill 1996). When the facades are categorized by the four nominal complexity levels (Modern = 1, Bare Classical = 2, Classical = 3, Detailed Classical = 4), the mean D for each category increases in rank order. Analysis further indicated a relatively high degree of similarity within categories, as evidenced by the low standard deviation values calculated for each one. This in-category homogeneity is also visually apparent in the four clusters (Fig. 13). The traditional facades (levels 3 and 4) fall into the upper range of complexity, aligning with previous suggestions that classical architecture tends to have higher fractal dimensions and possibly greater visual coherence (Capo 2004; Samper and Herrera 2014).

Building Category – Complexity Level	N	Mean	SD	Min	Max
1. Modern	7	1.32	0.0536	1.24	1.39
2. Bare Classical	7	1.51	0.0545	1.43	1.58
3. Classical	7	1.68	0.0256	1.65	1.72
4. Detailed Classical	7	1.78	0.0256	1.75	1.83

Table 8. Fractal dimension of building facades by complexity level

Building Category – Complexity Level	N	Mean	SD	Min	Max
1. Modern	7	0.0803	0.0296	0.0550	0.126
2. Bare Classical	7	0.2243	0.1868	0.0400	0.445
3. Classical	7	0.5947	0.0337	0.5433	0.630
4. Detailed Classical	7	0.7202	0.0326	0.6545	0.752

Table 9. Visual attention coherence scores of building facades by complexity level

Visual Attention Coherence Scores

The visual attention coherence (VAC) scores obtained with 3M-VAS also spanned a broad range, from 6 to 75% (see Table 9). Plotted by facade group (Fig. 14) they show a clear pattern. Complexity levels 4 and 3 consistently had the highest VAC scores, and levels 1 and 2 the lowest. In several groups, the “Modern” and “Bare Classical” facades scored so low that they attracted hardly any predicted attention—often resulting in VAC values under 10% and an absence of gaze sequence points or hotspots. In such cases, the difference between level 1 and 2 became negligible, and sometimes the ordering changed by a slight margin. By contrast, the “Classical” and “Detailed Classical” facades almost always registered multiple hotspots and widespread heatmap coverage, indicating that a viewer’s gaze would be drawn to many features. The consistency of this pattern across groups again shows that ornamentation and complexity are more likely to capture viewers’ immediate attention.

We also observed that in some mixed-complexity groups the simpler facades not only had low scores but failed to engage the model at all. Hence the comparison between low and medium complexity can suffer from a floor effect. This limitation in the data is reflected in the larger variance of VAC scores among simpler facades (levels 1-2) relative to more complex ones (levels 3-4). Despite this, statistical analysis across all 28 facades confirms a very strong positive correlation between fractal dimension and VAC score (Pearson’s $r = 0.946$; $p < 0.001$). Linear regression analysis further demonstrated that as fractality increases, so do VAC scores; thus the strong model fit and statistically significant predictor suggest that fractal dimension is a strong determinant of visual attention ($R^2 = 0.896$; $p < .001$). This is visualized in the scatter plot (Fig. 15). There are also significant statistical correlations between VAS reports and fractal dimensions, including heatmaps (Pearson’s $r = 0.932$; $p < 0.001$), hotspots (Pearson’s $r = 0.935$; $p < 0.001$), gaze sequence (Pearson’s $r = 0.865$; $p < 0.001$), and areas of interest (Pearson’s $r = 0.902$; $p < 0.001$). These findings suggest that scalable fractal complexity is a key factor in determining the visual impact of architectural designs.

In summary, our visual attention results support the hypothesis that ornate traditional designs capture more of the viewer’s pre-attentive vision, confirming that complexity enhances visual engagement (R. Taylor 2006; Daniel E. Berlyne 1971). Likewise, our results align with previous findings that visually complex environments tend to be more engaging, aesthetically pleasing, and visually preferable to humans (Lavdas, Salingaros, and Sussman 2021; Lavdas and Salingaros 2022; Ro and Huffman 2024; Rosas et al. 2023; Lee and Ostwald 2021). Yet we interpret these results with caution, acknowledging that our simulation captures only one aspect of “attention”—an immediate, unconscious orienting response—and does not measure long-term preference or aesthetic appraisal.

Discussion

Interpretation of Results

Our findings provide strong evidence that fractal complexity in architectural facades is associated with enhanced visual attention. The correlation through our set of AI-generated images between fractal dimension and predicted attention supports the notion that intricate traditional architectural forms, with their inherent fractality, are more engaging to the human eye than plain designs (Alexander 2002-2005; Nikos A. Salingaros 2013b). This finding aligns with the broader literature on visual attention and aesthetics, which highlights the role of organized complexity in capturing and sustaining interest (Daniel E. Berlyne 1970; Daniel E. Berlyne 1971; Silvia 2005). It also resonates with neuroaesthetic theories that humans may be biologically “hard-wired” to respond positively to patterns reminiscent of nature’s fractals (R. Taylor 2006; C.M.P. Hagerhall et al. 2015). Our study extends these concepts to architectural facades, adding empirical weight to longstanding intuitions: richly detailed facades not only attract the eye initially but also please the senses more than plain ones.

At the same time, our approach sheds light on the unconscious, pre-attentive component of this association. The use of an AI vision model allowed us to isolate an immediate visual response free from biases such as personal taste, familiarity, or cultural conditioning that would inform conscious evaluation. Even without such higher-level factors, the model consistently favored fractal-rich images—implying that our first glance might universally favor complexity and ornament. One study using live subjects supports this theory: buildings with fractal geometry like that of nature tend to attract attention quicker (“time to first fixation”) and hold it longer (“dwell time”), as “complexity informs the brain of stimuli worth examining more closely” (Rosas et al. 2023). In the words of the architect Robert A. M. Stern, “when your eye is bored, your brain is bored” (Robert A.M. Stern: *Always a Student*, 2019). This lends credence to the idea of a biologically based unconscious aesthetic response (Nikos A. Salingaros 2012; Kellert 2005).

We should again not overgeneralize these findings into a claim of a “universal preference” for more fractal buildings. Our results concern initial visual attention, not long-term preference or holistic perception. After the initial attraction, it may be that it is viewers’ cultural background and personal experience that determine whether they find a fractal-rich facade beautiful or overelaborate. According to Bourdieu’s theory of *habitus*, individual upbringing and social context cultivate our tastes. Someone accustomed to minimalist modernism, for instance, might consciously favor a plain facade even if their eye is momentarily caught by a Baroque one. Three independent surveys using questionnaires, eye-tracking biometrics, and predictive simulations to ascertain whether people prefer modern or traditional federal

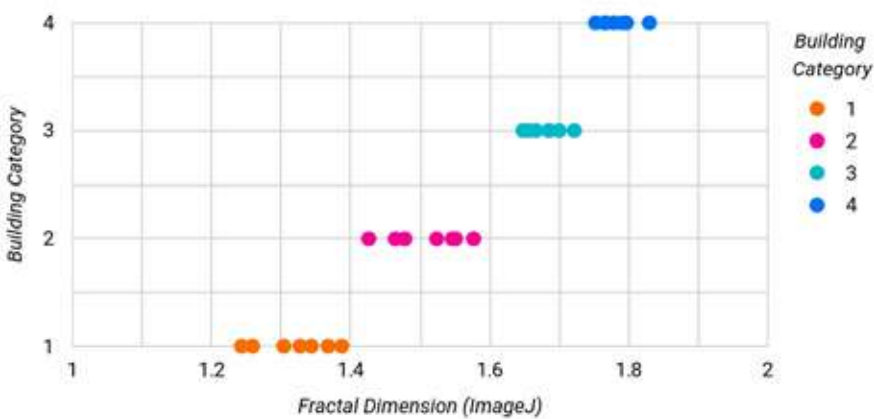


Figure 13: Four distinct clusters are visible for the fractal dimension (D-value) of the four complexity types

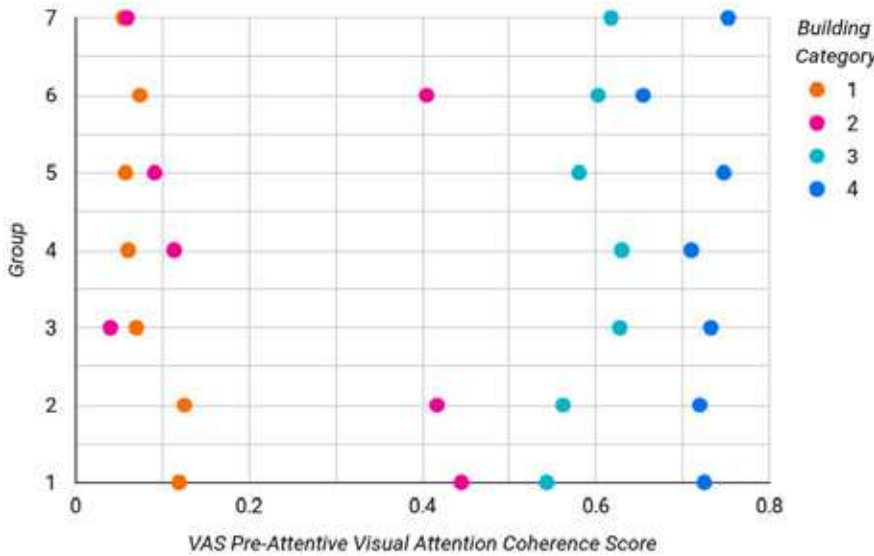


Figure 14: The 7 groups and the visual attention coherence scores of each facade, colored by complexity type

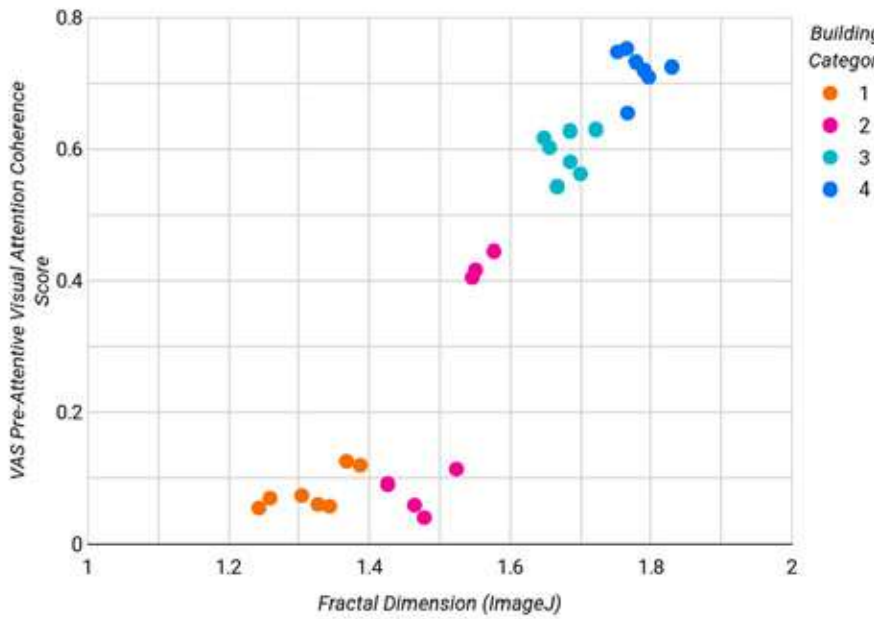


Figure 15: Scatter plot of fractal dimension against visual attention coherence score, colored by building type

buildings have found that traditional styles are not only consciously preferred by Americans (in one case by 72%) regardless of gender, age, geographic region, household income, education, political affiliation, and race/ethnicity (“Americans’ Preferred Architecture for Federal Buildings: A National Civic Art Society Survey conducted by the Harris Poll” October 2020), but that these same styles also tend to attract unconscious visual attention as well as retain it after conscious awareness more than modern ones (Rosas et al. 2023; Ro and Huffman 2024). Thus, we interpret our findings as highlighting just one piece of the aesthetic puzzle: fractal geometry gives a facade a better chance of being noticed and visually processed early on, but an ultimate appraisal of beauty involves subsequent cognitive and cultural filtering.

Implications for Architectural Design

These findings have implications for architectural practice and urban design. Architects and designers seeking to create engaging and psychologically restorative environments could consider incorporating fractal geometry or self-similar patterns into facades to increase the likelihood of capturing attention and encourage visual exploration. Our results support the view of advocates of traditional and biophilic design that ornamentation and complexity are not wasteful uses of materials but rather have tangible benefits for human experience (Nikos A. Salingaros and Sussman 2020; Kellert 2005). Incorporating fractal scaling might make a building facade not only more interesting to look at but potentially more restorative by echoing the way that fractal natural scenes reduce stress (Kellert 2005; R. Taylor 2006; Nikos A. Salingaros 2012).

From a technological standpoint, our use of AI tools points to an avenue for evidence-based design evaluation. Designers may generate multiple facade options with AI and then test them with a vision prediction model to get rapid feedback as to which designs are likely to be eye-catching. Such an approach could help bridge the gap between architects’ aesthetics and public preferences, as there is often a disconnect between what architects and laypersons find appealing (Chávez and Milner 2019; Ro and Huffman 2024; Frangos Feb. 7, 2007; Brown and Gifford 2001; Darke 1984; Devlin and Nasar 1989; Devlin 1990; N.B. Smith 2019). Our study contributes to this debate by quantifying one aspect of what the “general public” might unconsciously notice. If traditional, ornamentally complex facades inherently draw more immediate attention (and possibly positive physiological responses), this could partly explain why laypeople often favor historical styles over austere modernist ones (Frangos Feb. 7, 2007; “Americans’ Preferred Architecture for Federal Buildings: A National Civic Art Society Survey conducted by the Harris Poll” October 2020). In practice, architects could use tools such as 3M-VAS early in the design process to assess visual interest. This should be balanced with other considerations,

as complexity can be overwhelming or costly. But our results suggest, at least as regards visual attention, that erring on the side of richer detail may be beneficial.

Finally, urban planners might consider that maintaining or reintroducing traditional facade complexity in streetscapes could enhance pedestrian experience. When many buildings are competing for our attention, not to mention other stimuli such as signage and screens (Pallasmaa 2011), understanding which architectural qualities naturally stand out could inform more human-friendly urbanism. So while a row of monotonous facades might prompt people to disengage from their surroundings, a visually varied, fractal-rich streetscape could promote place-making through visual interest and pleasure. Our findings contribute to a growing recognition that the visual intricacy inherent in traditional architecture has quantifiable value in today’s built environment. Rather than viewing ornament as “crime” (Loos 1908), designers may leverage ornament and pattern to create buildings that not only look and feel engaging but also benefit human health and well-being (Ro 2024).

Limitations and Future Work

Despite its promising results, this study has limitations that must moderate our conclusions. The use of AI-generated facades, while innovative in controlling design variables, may not fully capture the complexity and cultural significance of real architecture (Alexander 2002-2005). Black-and-white AI images lack the textural and material qualities present in real buildings as well as historical and cultural context. By focusing on the geometric and unconscious aspects of vision, we also exclude sociocultural and cognitive variables. We justify this exclusion as a way to isolate one component of aesthetic perception, but it remains a scope limitation. Aesthetic experience of architecture, of which our model addresses only one facet, is holistic.

Additionally, our reliance on the 3M-VAS tool means that we modeled only low-level, pre-attentive visual response. Any eye-tracking predictions, as opposed to real observer data, may introduce bias (Ro and Huffman 2024; Hollander et al. 2020; Rosas et al. 2023). Future research would benefit from empirical eye-tracking trials with human participants.

Another limitation is that the visual attention coherence (VAC) score was not calculated for each facade individually but assigned to each member of a group and then analyzed collectively. While this method is effective for establishing a visual attention hierarchy within the group, it does not reflect the characteristics of individual facades. Rather, the score represents the relative “weight” of attention that each facade commands in relation to others. Consequently, the same facade might receive a different VAC score if analyzed within another group.

A corollary of this approach is that facades receiving minimal attention within a group may have their VAC score computed in a sample that is too small, potentially misrepresenting their comparative ability to attract attention. This effect is observed in groups 3, 4, 5, and 7, where attention is overwhelmingly directed toward buildings of complexity levels 3 and 4. As a result, the VAC score for complexity levels 1 and 2 both fall to near zero and can change in order. This suggests that while our grouping method may reflect realistic scenarios (a streetscape with varied buildings), it also complicates interpretation of the absolute attention-catching ability of simpler facades. Future studies could consider grouping buildings of similar complexity together or presenting facades one at a time to measure their attention capture in isolation. This would help determine, for example, if a bare classical facade consistently outperforms a modern one in absolute terms or if their performance is context-dependent.

This study moreover addresses the unconscious or pre-attentive phase of vision, not any conscious preference for visual complexity. An intriguing question arises: do people prefer the most fractal facades, or is there an optimal middle range that maximizes appeal? Our work shows that higher complexity attracts attention, but one could also ask viewers directly about their preferences after viewing. Future research should complement attention predictions with surveys of conscious preference and emotional response to see how fractal dimension correlates with stated preferences across cultural groups. This would explore whether the facades that attract visual attention are also those that people find beautiful or whether other factors (perhaps cultural conditioning, familiarity, or style bias) inform the final verdict of taste.

In summary, this study demonstrates a clear link between fractality and immediate visual attention on architectural facades using novel AI tools for stimulus generation and response measurement, showing the value of self-similar scaling patterns and organized complexity in architectural design. Our findings suggest that fractal patterns—common in traditional architecture—stimulate visual engagement by echoing natural geometries that resonate with the human brain. This supports the idea that certain architectural design principles, such as proportionality, fractal scaling, ornament, and intricate detailing, have a perceptual and cognitive rationale.

As contemporary architecture continues to explore minimalism and abstraction for the sake of efficiency and cost reduction, our study highlights the enduring relevance of tradition in fostering visual and emotional connections with built environments. Yet our contribution should be seen as one piece of a larger puzzle in aesthetic research. By isolating and quantifying one effect (fractal complexity on visual attention), we hope to inform ongoing debates and encourage further studies. These could guide design practice as to how a traditional aesthetic interacts with the

eye, brain, and body. Architects and urban planners should strive ultimately to design buildings that are both visually engaging and beneficial to human psychophysiological health.

References | Referencias | Referências

3M. 2010. *3M Visual Attention Service Validation Study* (consulted on 07/03/2023)

3M. 2023. *Visual Attention Software*. 3M Company. <https://vas.3m.com/> (consulted on 07/03/2023)

Abboushi, Belal; Elzeyadi, Ihab; Taylor, Richard; and Sereno, Margaret. 2019. Fractals in architecture: The visual interest, preference, and mood response to projected fractal light patterns in interior spaces. *Journal of Environmental Psychology* 61: 57-70. <https://doi.org/10.1016/j.jenvp.2018.12.005>

Adam, Robert. 1990. *Classical Architecture*. New York: Harry N. Abrams.

Aisyah, Khansa Salma; Noerwasito, Vincentius Totok; and Novianto, Didit. 2023. Implementing Fractal to Define Balinese Traditional Architectural Facade Beauty: The Kori Agung. *DIMENSI: Journal of Architecture and Built Environment*, 50, 2: 111-126.

Alexander, Christopher. 2002-2005. *The Nature of Order, Books 1 to 4*. Berkeley: Center for Environmental Structure.

Aykal, Demet; Erbaş Özil, Meltem; and Hizar, Merve. 2020. Architectural Analysis Based on Fractal Dimension on Diyarbakir Mosques. *Online Journal of Art and Design*, 8, 1: 47-57.

Barnsley, Michael. 1993. *Fractals Everywhere*. San Diego: Morgan Kaufmann.

Berlyne, Daniel. 1970. Novelty, complexity, and hedonic value. *Perception & psychophysics*, 8, 5: 279-286.

Berlyne, Daniel. 1971. *Aesthetics and psychobiology*. New York: Appleton-Century-Crofts.

Bies, Alexander J.; Blanc-Goldhammer, Daryn; Boydston, Cooper R.; Taylor, Richard P.; and Sereno, Margaret E. 2016. Aesthetic Responses to Exact Fractals Driven by Physical Complexity. *Frontiers in Human Neuroscience*, 10.

Bourdieu, Pierre. 1977. *Outline of a Theory of Practice*. Cambridge: Cambridge University Press.

Bovill, Carl. 2008. The Doric Order as a Fractal. *Nexus Network Journal*, 10, 2: 283-290. <https://doi.org/10.1007/s00004-007-0070-x>

Bovill, Charles B. 1996. *Fractal geometry in architecture and design*. Boston: Birkhäuser.

Brown, Graham; and Gifford, Robert. 2001. Architects Predict Lay Evaluations of Large Contemporary Buildings: Whose Conceptual Properties?.. *Journal of Environmental Psychology*, 21, 1: 93-99. <https://doi.org/https://doi.org/10.1006/jevvp.2000.0176>

Capo, Daniele. 2004. The Fractal Nature of the Architectural Orders. *Nexus Network Journal*, 6, 1: 30-40. <https://doi.org/10.1007/s00004-004-0004-9>

Chávez, Francisco Contreras; and Milner, David. 2019. Architecture for Architects? Is there a ‘Design Disconnect’ between Most Architects and the Rest of the Non-Specialist Population?. *New Design Ideas*, 3, 1: 32-43. <http://jomardpublishing.com/UploadFiles/Files/journals/NDI/V3N1/ChavezF%20MilnerD.pdf>

Coburn, Alexander; Vartanian, Oshin; and Chatterjee, Anjan. 2017. Buildings, beauty, and the brain: a neuroscience of architectural experience. *Journal of Cognitive Neuroscience*, 29, 9:1521-1531. [https://ezproxy.uvu.edu/login?url=http://search.ebscohost.com/](https://ezproxy.uvu.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=edsggo&AN=edsgcl.505100996&site=eds-live)

[login.aspx?direct=true&db=edsggo&AN=edsgcl.505100996&site=eds-live](https://ezproxy.uvu.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=edsggo&AN=edsgcl.505100996&site=eds-live)

Coburn, Alexander; Kardan, Omid; Kotabe, Hiroki; Steinberg, Jason; Hout, Michael C.; Robbins, Arryn; MacDonald, Justin; Hayn-Leichsenring, Gregor; and Berman, Marc G. 2019. Psychological responses to natural patterns in architecture. *Journal of Environmental Psychology*, 62: 133-145. <https://doi.org/10.1016/j.jenvp.2019.02.007>

Crompton, Andrew. 2002. Fractals and Picturesque Composition. *Environment and Planning B: Planning and Design*, 29, 3: 451-459. <https://doi.org/10.1068/b12822>

Darke, Jane. 1984. Architects and User Requirements in Public-Sector Housing: 1. Architects’ Assumptions about the Users. *Environment and Planning B: Planning and Design*, 11, 4: 389-404. <https://doi.org/10.1068/b110389>

Devlin, Kimberly. 1990. An Examination of Architectural Interpretation: Architects versus Non-Architects. *Journal of Architectural and Planning Research*, 7, 3: 235-244. <http://www.jstor.org/stable/43028971>

Devlin, Kimberly; and Nasar, Jack L. 1989. The beauty and the beast: Some preliminary comparisons of ‘high’ versus ‘popular’ residential architecture and public versus architect judgments of same. *Journal of Environmental Psychology*, 9, 4: 333-344. [https://doi.org/10.1016/S0272-4944\(89\)80013-1](https://doi.org/10.1016/S0272-4944(89)80013-1)

Eberhard, John P. 2009. Applying Neuroscience to Architecture. *Neuron*, 62: 753-756.

Eberhard, John P. 2014. Aesthetics and the Brain. Academy of Neuroscience for Architecture Conference, Salk Institute for Biological Studies, La Jolla. <http://youtu.be/PlrW-k1gVhc> (consulted on 05/11/2014)

Foulsham, Tom; Frost, Emma; and Sage, Lilly. 2018. Stable individual differences predict eye movements to the left, but not handedness or line bisection. *Vision Research*, 144: 38-46. <https://doi.org/10.1016/j.visres.2018.02.002>

Frangos, Alex. 2007. In the Eye of the Beholder: Public, Designers at Odds on What’s a Beautiful Building. *Wall Street Journal*.

Geertz, Clifford. 1993. Religion as a Cultural System. *The Interpretation of Cultures: Selected Essays*: 87-125. Waukegan: Fontana Press.

Hagerhall, Caroline M; Laike, Thorbjörn; Taylor, Richard P; Küller Marianne; Küller, Rikard; and Martin, Theodore P. 2008. Investigations of Human EEG Response to Viewing Fractal Patterns. *Perception*, 37, 10: 1488-1494. <https://doi.org/10.1068/p5918>

Hagerhall, Caroline M.; Laike, Thorbjörn; Küller, Marianne; Marcheschi, Elizabeth; Boydston, Cooper R.; and Taylor, Richard P. 2015. Human physiological benefits of viewing nature: EEG responses to exact and statistical fractal patterns. *Nonlinear dynamics, psychology, and life sciences*, 19, 1: 1-12.

Heath, Tom; Smith, Sandy G.; and Lim, Bill. 2000. Tall buildings and the urban skyline: The effect of visual complexity on preferences. *Environment and Behavior*, 32, 4: 541-556.

Hollander, Justin B.; Sussman, Ann; Lowitt, Peter; Angus, Neil; and Situ, Minyu. 2020. Analyzing Walkability Through Biometrics: Insights Into Sustainable Transportation Through the Use of Eye-Tracking Emulation Software. *Journal of Physical Activity and Health*, 17, 11: 1153-1161. <https://doi.org/10.1123/jpah.2020-0127>

Jacobus, Frank; and Kelly, Brian M. 2023. *Artificial Intelligent Architecture*. San Francisco: Oro Editions.

Joye, Yannick. 2007. Fractal Architecture Could Be Good for You. *Nexus Network Journal*, 9, 2: 311-320. <https://doi.org/10.1007/s00004-007-0045-y>

Kellert, Stephen R. 2005. *Building for Life: Designing and Understanding the Human-Nature Connection*. Washington D.C.: Island Press.

Lavdas, Alexandros A.; Mehaffy, Michael W.; and Salingaros, Nikos A. 2023. AI, the beauty of places, and the metaverse: Beyond “geometrical fundamentalism”. *Architectural Intelligence*, 2, 1: 8. <https://doi.org/10.1007/s44223-023-00026-z>

Lavdas, Alexandros A.; and A. Salingaros, Nikos. 2022. Architectural Beauty: Developing a Measurable and Objective Scale. *Challenges*, 13, 2: 56. <https://www.mdpi.com/2078-1547/13/2/56>

Lavdas, Alexandros A., A. Salingaros, Nikos; and Sussman, Ann. 2021. Visual Attention Software: A New Tool for Understanding the ‘Subliminal’ Experience of the Built Environment. *Applied Sciences*, 11, 13: 6197. <https://www.mdpi.com/2076-3417/11/13/6197>

Leach, Neil. 2022. *Architecture in the Age of Artificial Intelligence: An Introduction to AI for Architects*. New York: Bloomsbury.

Lee, Ju Hyun; and Ostwald, Michael J. 2021. Fractal Dimension Calculation and Visual Attention Simulation: Assessing the Visual Character of an Architectural Façade. *Buildings*, 11, 4: 163. <https://www.mdpi.com/2075-5309/11/4/163>

Lee, Ju Hyun; and Ostwald, Michael J. 2021. The ‘visual attractiveness’ of architectural facades: measuring visual complexity and attractive strength in architecture. *Architectural Science Review*, 66, 1: 42-52. <https://doi.org/10.1080/00038628.2022.2137458>

Lee, Ju Hyun; and Ostwald, Michael J. 2024. Mathematical beauty and Palladian architecture: Measuring and comparing visual complexity and diversity. *Frontiers of Architectural Research*, 13, 4: 729-740. <https://www.sciencedirect.com/science/article/pii/S2095263524000487>

Loos, Adolf. 1998 [1908]. *Ornament and Crime: Selected Essays*. Riverside: Ariadne Press.

Lythgoe, Joshua; and Ro., Brandon R. 2024. The Visual Attention of the Fractal Dimension: Exploring the Ideal Fractal Dimension for an Architectural Facade. Intermountain Engineering, Technology and Computing Conference, Logan.

Mandelbrot, Benoit B. 1982. *The Fractal Geometry of Nature*. San Francisco: W.H. Freeman.

Mandelbrot, Benoit B. Scalebound or Scaling Shapes: A Useful Distinction in the Visual Arts and in the Natural Sciences. *Leonardo*, 40, 5: 494-496. <https://research.ebsco.com/linkprocessor/plink?id=df281f4d-f0b6-32e7-a8f8-3f8d95aa440f>

Mead, Margaret; and Métraux, Rhoda (eds.). 2000. *The Study of Culture at a Distance*. New York: Berghahn Books.

National Civic Art Society. 2020. *Americans’ Preferred Architecture for Federal Buildings: A National Civic Art Society Survey conducted by the Harris Poll*. <https://www.civcart.org/americans-preferred-architecture-for-federal-buildings> (consulted on 01/04/2022)

Okuyucu, Şerife Ebru; and Baştaş, Melek Sultan. 2023. Analysis based on fractal geometry of traditional housing facades: Afyonkarahisar traditional housing facade examples, Turkey. *Applied Nanoscience*, 13, 3: 2489-2505. <https://doi.org/10.1007/s13204-021-02226-3>

Ostwald, Michael J.; and Vaughan, Josephine. 2016. *The Fractal Dimension of Architecture*. Cham: Birkhäuser.

Pallasmaa, Juhani. 2011. *The Embodied Image: Imagination and Imagery in Architecture*. Chichester: John Wiley & Sons.

Pudine, Halime. 2015. A study on dimensions of Fractal geometry in Iranian Architecture. *Urban Management*, 41: 257-267.

Ro, Brandon R. 2024. Beauty and the Brain: Reconsidering the Role of Ornament in Architecture. Beauty and Ugliness in Architecture Conference, Oslo. <https://youtu.be/pQYaUa6pYOU?si=kzfESPAFMwAmlkfh>

Ro, Brandon R. 2025. Sacred Spaces Reimagined: Exploring Artificial Intelligence in the Ritual-Architectural Design Process. In Tsuria,

Ruth; Vitullo, Alessandra; and Mansour, Nesrine (eds.). *Religion and AI: Theoretical and empirical approaches*. New York: Bloomsbury.

Ro, Brandon R.; and Huffman, Hunter. 2024. Architectural Design, Visual Attention, and Human Cognition: Exploring Responses to Federal Building Styles. *Planning Practice & Research*, 40, 3: 447-486. <https://doi.org/10.1080/02697459.2024.2342755>

“Robert A.M. Stern: Always a Student” (documentary). 2019. Design in Mind. Institute of Classical Architecture & Art.

Robinson, Sarah; and Pallasmaa, Juhani (eds.). 2015. *Mind in Architecture: Neuroscience, Embodiment, and the Future of Design*. Cambridge: MIT Press.

Robles, Kelly E.; Liaw, Nicole A.; Taylor, Richard P.; Baldwin, Dare A.; and Sereno, Margaret E. 2020. A shared fractal aesthetic across development. *Humanities and Social Sciences Communications*, 7, 1: 158. <https://doi.org/10.1057/s41599-020-00648-y>

Rosas, Hernan J.; Sussman, Ann; C. Sekely, Abigail; and Lavdas, Alexandros A. 2023. Using Eye Tracking to Reveal Responses to the Built Environment and Its Constituents. *Applied Sciences*, 13, 21: 12071. <https://www.mdpi.com/2076-3417/13/21/12071>

Ruggles, Donald H. 2017. *Beauty, Neuroscience and Architecture: Timeless Patterns and Their Impact on Our Well-Being*. Denver: Fibonacci.

Salingaros, Nikos A. 2012. Fractal Art and Architecture Reduce Physiological Stress. *Journal of Biourbanism*, 2: 11-28.

Salingaros, Nikos A. 2013a. *A Theory of Architecture*. Portland: Sustasis Press.

Salingaros, Nikos A. 2013b. *Unified Architectural Theory: Form, Language, Complexity*. Portland: Sustasis Foundation.

Salingaros, Nikos A. 2022. Architecture’s abysmal ignorance: Artificial Intelligence reveals what experts deny. *The Critic*.

Salingaros, Nikos A.; and Sussman, Ann. 2020. Biometric Pilot-Studies Reveal the Arrangement and Shape of Windows on a Traditional Façade to be Implicitly ‘Engaging’, Whereas Contemporary Façades are Not. *Urban Science*, 4, 2: 26. <https://www.mdpi.com/2413-8851/4/2/26>

Samper, Alberto; and Herrera, Blas. 2014. The Fractal Pattern of the French Gothic Cathedrals. *Nexus Network Journal*, 16: 251 - 271.

Silvia, Paul J. 2005. Cognitive appraisals and interest in visual art: Exploring an appraisal theory of aesthetic emotions. *Empirical studies of the arts*, 23, 2: 119-133.

Silvia, Paul J. 2012. Human Emotions and Aesthetic Experience: An overview of empirical aesthetics. In Shimamura, Arthur P.; and Palmer, Stephen E. (eds.), *Aesthetic science: connecting minds, brain and experience*, 250-275. New York: Oxford University Press.

Smith, Austen K.; Szelest, Izabela; Friedrich, Trista E.; and Elias, Lorin J. 2015. Native reading direction influences lateral biases in the perception of shape from shading. *Laterality*, 20, 4: 418-433. <https://doi.org/10.1080/1357650X.2014.990975>

Smith, Nicholas Boys. 2019. What explains the ‘design disconnect’ between most people and professionals?. In Airey, Jack (ed.), *Building Beautiful: A collection of essays on the design, style and economics of the built environment*, 49-52. London: Policy Exchange.

Spehar, Branka; Clifford, Colin W. G.; Newell, Ben R.; and Taylor, Richard P. 2003. Universal aesthetic of fractals. *Computers & Graphics*, 27, 5: 813-820. [https://doi.org/10.1016/S0097-8493\(03\)00154-7](https://doi.org/10.1016/S0097-8493(03)00154-7)

Sussman, Ann, and Hollander, Justin B. 2015. *Cognitive Architecture: Designing for How We Respond to the Built Environment*. New York: Routledge.

Taylor, Richard. 2006. Reduction of Physiological Stress Using Fractal Art and Architecture. *Leonardo*, 39: 245-251. <https://doi.org/10.1162/leon.2006.39.3.245>

Taylor, Richard P.; and Spehar, Branka. 2016. Fractal Fluency: An Intimate Relationship Between the Brain and Processing of Fractal Stimuli. In Di Ieva, Antonio (ed.), *The Fractal Geometry of the Brain*, 485-496. New York: Springer.

Taylor, Richard P.; Spehar, Branka; Clifford, Colin W. G.; Wise, J.A.; Newell, B. R., Hagerhall, Caroline Madeleine; Purcell, T.; and Martin, Theodore P. 2005. Perceptual and physiological responses to the visual complexity of fractal patterns. *Nonlinear Dynamics, Psychology, and Life Sciences*, 9, 1: 89-114. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-14544269362&partnerID=40&md5=c42fde1915e7da9a71df553fd96a5665>

Trivedi, Kirti. 1989. Hindu temples: Models of a fractal universe. *The Visual Computer*, 5, 4: 243-258. <https://doi.org/10.1007/BF02153753>

Vaughan, Josephine; and Ostwald, Michael J. 2010. Using fractal analysis to compare the characteristic complexity of nature and architecture: re-examining the evidence. *Architectural Science Review*, 53, 3: 323-332. <https://doi.org/10.3763/asre.2010.0024>

Zeisel, John. 2006. *Inquiry by Design: Environment / behavior / neuroscience in Architecture, Interiors, Landscape, and Planning*. New York: W.W. Norton.

Biographies | Biografías | Biografias

Brandon R. Ro

Brandon R. Ro, AIA, NCARB, ICAA is an award-winning architect, researcher, and educator. He is the Principal and founder of Tetrad Architecture and Planning. His projects have received awards from the U.S. Green Building Council, American Institute of Architects, American Planning Association, and Walt Disney Imagineering, among others. As co-founder of Utah Valley University’s professional degree in architecture, he was instrumental in developing new curricula rooted in the classical tradition. As Assistant Professor, he taught design studios as well as architectural history and theory. His published research aims at improving interconnectivity between architecture, culture, and experience.

Xavier Parareda

Xavier Parareda is a data scientist who uses data-driven approaches to rethink how we view and interact with our world and the built environment. Xavier grew up in Burgos, Spain, where he now resides. He has lived for three years in Italy and for ten in the Netherlands, where he started out in data science. Together with a group of urban advocates, in 2023 he founded the Resurgir Estético Burgos movement, a citizen initiative aimed at restoring beauty to all parts of the city, not just the historic center.

Tara Douglas

Building Village Life in Kamhua Noknu, Arunachal Pradesh

Construyendo la vida comunitaria en Kamhua Noknu, Arunachal Pradesh

Construindo a vida na aldeia de Kamhua Noknu, Arunachal Pradesh

Keywords | Palabras clave | Palavras chave

Vernacular architecture, Northeast India, Wancho community, Indigenous knowledge, Endangered traditions

Arquitectura vernácula, Nordeste de la India, Comunidad wancho, Conocimientos autóctonos, Tradiciones en peligro de desaparición

Arquitetura vernácula, Nordeste da Índia, comunidade Wancho; Conhecimento indígena, Tradições em risco de extinção

Abstract | Resumen | Resumo

Modernizing change at the periphery of Arunachal Pradesh in northeast India is visible in the growing number of modified structures in traditional Wancho settlements. This project researches and documents the community’s endangered architectural heritage. Their ephemeral buildings of organic materials require regular reconstruction, and each rebuilding becomes a significant event that brings the village together and revitalizes the transmission of indigenous knowledge. This study synthesizes the expertise of architects with the knowledge of local craftspeople and construction experts, surveying four villages along the border with Myanmar with a focus on four building types: the traditional house, the modified frame house, the *morung* or *paa*, and the chief’s house. Our ethnographic recordings form an archive of knowledge on construction methods, materials, history, customs, and a traditional way of life.

El impacto de los cambios en la periferia de Arunachal Pradesh, en el nordeste de la India, es visible en el creciente número de estructuras modificadas en los asentamientos tradicionales de los wancho. En este proyecto se investiga y documenta el patrimonio arquitectónico de la comunidad, actualmente en peligro de desaparición. Las construcciones efímeras, realizadas con materiales orgánicos, necesitan una reconstrucción periódica, y cada reedificación se convierte en todo un acontecimiento que reúne a la comunidad y revitaliza la transmisión de conocimientos autóctonos. El estudio combina la competencia técnica de los arquitectos con los valiosos conocimientos de los artesanos y expertos en construcción locales.

Realizado en cuatro pueblos fronterizos con Myanmar, se centra en cuatro tipos de construcción: la casa tradicional, la casa de entramado de madera modificado, el *morung* o *paa*, y la casa del jefe. Los registros etnográficos constituyen un repositorio de conocimientos sobre los métodos, materiales y procesos; la historia, las costumbres y prácticas de construcción, así como sobre el estilo de vida tradicional.

O impacto da mudança na periferia de Arunachal Pradesh, no nordeste da Índia, é visível no número crescente de estruturas modificadas nas povoações tradicionais Wancho. O projeto pesquisa e documenta o património arquitetónico ameaçado da comunidade. As construções efêmeras, feitas de materiais orgânicos, requerem reconstrução regular, e cada reconstrução torna-se um evento significativo que une a aldeia e revitaliza a transmissão do conhecimento indígena. O estudo sintetiza a especialização técnica dos arquitetos com o conhecimento inestimável dos artesãos locais e especialistas em construção. O levantamento em quatro aldeias ao longo da fronteira com Mianmar concentra-se em quatro tipos de edifícios: a casa tradicional, a casa de estrutura modificada, o *morung* ou *paa* e a casa do chefe. As gravações etnográficas formam um arquivo de conhecimento sobre métodos de construção, materiais, processos, história, costumes, práticas e o modo de vida tradicional.

Introduction

The traditional buildings constructed by the people of the Wancho community, at the periphery of northeast India in Arunachal Pradesh, are made of wood, bamboo, and palm-leaf thatch. The use of organic materials and the region’s heavy annual rainfall account for the ephemeral character of these buildings, which must be reconstructed every eight to ten years. Each rebuilding represents a significant village event that assembles the community and revitalizes age-old practices of knowledge transmission, reciprocity, and social bonding as villagers contribute cooperatively to a labor of renewal. However, during visits to the area I have witnessed rapid change and its impact on this traditional way of life, as each year more modified buildings are erected. In Jagan, the last village before the border with Myanmar, there remain no traditional *morungs*; these iconic cultural institutions that have long been a space for mobilizing the male population are now replaced by buildings of corrugated iron and concrete. Formerly, traditional *morungs* (*paa* in Wancho) were places that would showcase local talent for woodcraft.

A project by Adivasi Arts Trust supported by the Endangered Wooden Architecture Programme (EWAP) at Oxford Brookes University set out to document the architectural traditions of some Wancho villages and ascertain the extent of endangerment and loss of their building customs. The study was conducted with the villagers and combined the expertise of architects and the knowledge of local craftspeople and expert builders. The architects measured, recorded, and analyzed traditional building designs and the

local experts provided insights into construction methods, materials, processes, history, customs, and the traditional way of life. The project was to promote interest in and attach value to this architecture so as to inspire local people to sustain this heritage, as the architects considered how traditional craftsmanship and materials might be adapted to develop new building designs. The recorded knowledge about construction processes and the uses and significance of this traditional architecture is available in an online archive (EWAP 2025).

The Wancho People

The Wancho are a tribe of 56,866 members (2011 census) living in the remote Patkai range of eastern Arunachal Pradesh, India. They have historically practiced self-sufficiency, dwelling in seclusion in rugged terrain where a lack of roads has limited contact with the outside world. Their isolation left them largely unscathed by the colonizing forces of the nineteenth and twentieth centuries. In 2011, what is now Longding District was carved out from Tirap District. The area is considered remote even within the North East Region, and limited contact with outsiders beyond neighboring tribes has helped preserve the indigenous heritage and traditional design of dwellings and community structures. Heavy rainfall makes the area still difficult to access by road and deters most visitors from venturing beyond the district capital, Longding Town. Visitors also need permits. This inaccessibility accounts for the limited research and literature on Wancho cultural traditions and practices.



Longding district and Tirap district



Boys assembled on the veranda of the *chingjaa paa* for the Dingtam festival (boys' initiation) in 2022

The Wancho consist of two groups that speak distinct dialects: those residing in the foothills bordering Assam, and those of the highlands stretching to the border with Myanmar. Their indigenous religious beliefs acknowledge nature and ancestral spirits and their customs have come down through songs and storytelling, rituals, and festivals.

The *paa* (male dormitory, school, and community center) is traditionally the main site of indigenous knowledge transfer among menfolk. But Christianity arrived in these villages about 30 years ago and the Wancho are now 99 percent Baptist or Catholic, which change has impacted traditional spiritual practices and led to a decline of the institution of the *paa*. Government schools have been established in the villages and modern education along

with new economic imperatives and mobile telephony, which has penetrated even the remoter areas, influence younger people’s perceptions of the enduring relevance of their ancestral way of life.

Research Background

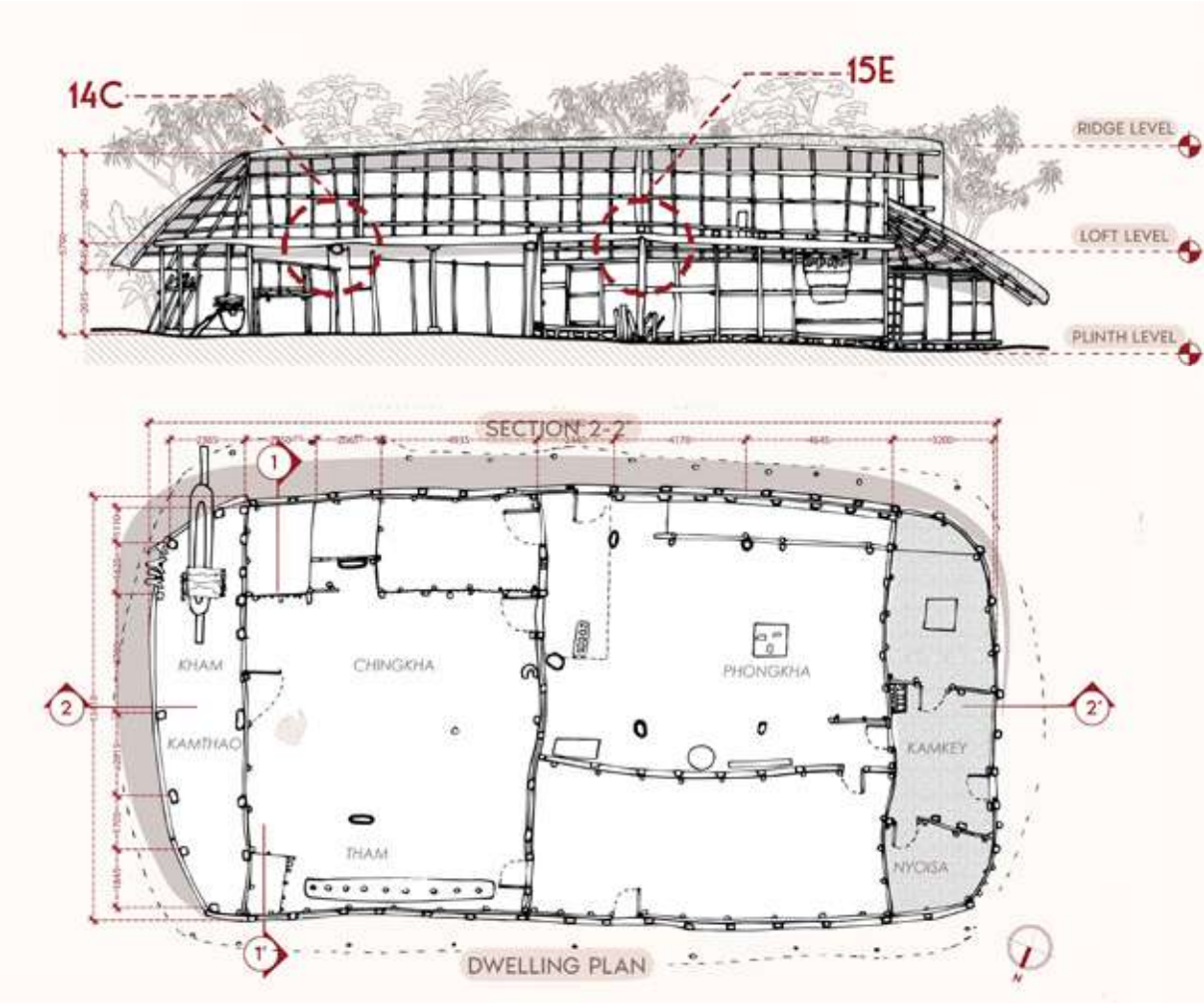
Northeast India is characterized by a diversity of local cultures and practices, with more than 200 tribes and 220 spoken dialects (Das 2023). Each tribe has a distinct traditional dwelling type. To some, the term “vernacular” represents a homogeneous range of architectural traditions deemed in need of preservation from changes that entail cultural decline (Vellinga 2011). But the self-sufficiency,



Front of the *chingjaa paa* in Kamhua Noknu, 2023

self-determination, and self-representation embodied by Wancho architecture are exceptional. The construction and reconstruction of buildings in their villages is a vital, dynamic process that reenacts cultural traditions each year, and the similarity of design in the village houses reflects

social equality. A study of Wancho architecture is thus an opportunity to decolonize perspectives and reexamine the standards of modernity that view the vernacular as romantic, primitive, or irrelevant.



Plan and section of Khasa Wangkam (Arnav & Anupama Architects)



Ngagang Wangham and Athen Wangcha outside the wangkam, Khasa, 2023 (Angam Wangpan)



Ngagang Wangham (chief of Khasa) and his wife Athen Wangcha



Weaving the floor of the hailay (bamboo platform), Kamhua Noknu in 2023

The impact of modernization in rural India threatens the transmission of vulnerable cultural knowledge embedded in traditional storytelling. Younger people are drawn away from villages in search of education and employment and have little time for such stories. My contacts with the Wancho community have shown the urgency of recording the oral histories and memories of elderly tribespeople.

The Project

Participation can be a way to reduce the inherent power relations of research (Stocking 1983). My participation in daily life in Kamhua Noknu fostered a familiarity with the villagers, and a relationship emerged with the community, guiding this study, although the remoteness of my cultural setting meant I had to adjust to a new frame of reference. Filmmaking is an intrusive activity, and questions arose about my presence as an outsider with a camera. But the villagers got used to me and have asked for recordings to be made so that their traditions may be documented and their culture more widely known, believing that this may bring state benefits.

Confronted by rapid change, the elder generation urges younger people to maintain their traditions. “Just as we don’t forget nature, like the sun and moon, we should never forget our culture and traditional way of life. We should not neglect our traditional houses and the way we cultivate the land because these are assets inherited from our forefathers,” says Ngagang Wangham, chief of Khasa village. Few villagers speak English and most elderly people are speakers only of Wancho, so recordings were made without our understanding what had been spoken. The raconteurs were nominated for their authoritative knowledge of particular topics, and so it was usually skilled craftspeople or village elders who spoke to the camera.

The videos were recorded as activities took place, with no staged reconstructions. They were interpreted with Jatwang Wangsa, the interlocutor, a bridge with the community and translator of all our interviews. Through patient sessions of translation with Jatwang and engagement with the material for logging, organization and subtitling, new insights emerged.

The Wancho Centre for Art Culture and Knowledge in Kamhua Noknu was our base. This is a bamboo house built prior to our second visit to Kamhua Noknu in 2020 at the initiative of Jatwang and his family, designed to accommodate a non-Wancho. A gas cooker dispenses with the need to gather firewood and a “sitting room” with a bamboo floor and wooden settee serves for receiving visitors. The space is organic and cozy, enlivened by natural sounds and sensations: wind, insects, rodents, and rain on the palm-leaf thatch.

Our survey by a team of six architects during the house-building season in late November involved photography and the measuring of 19 sample buildings, with observations being recorded about materials, dimensions, and bioclimatic features. The volunteer architects were mostly from the state of Assam, and this proximity made it easy for them to adjust to village life. They selected case studies to illustrate the range of Wancho buildings, identifying four types of structure: the traditional house; the frame house; the *morung* (*paa*); and the chief’s house (*wangkam*). Their field sketches were refined using CAD and finished by hand-detailing for plans, scales, and elevations. A drone operator from Longding Town took aerial photos of the structures and their settings.

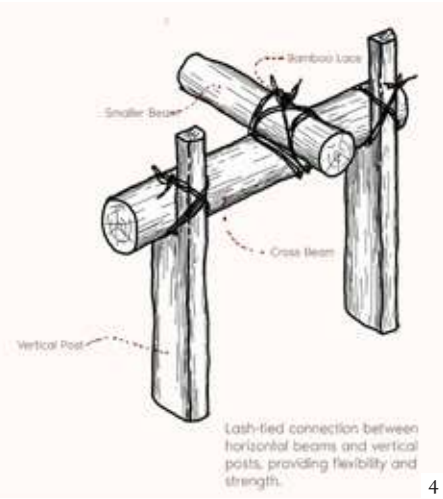
I shared research ideas and recorded material at meetings with community members, holding interactive sessions and seeking to prompt reflections by younger people.



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4. Detail of lashed joint (Arnav & Anupama Architects)
5. Front of Gangpoh Gansa's traditional house, Jagan, 2023



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1. Drone view of Kamhua Noknu village, 2023 (Angam Wangpan)
2. Location of the study villages in Longding District, Arunachal Pradesh, India
3. Hondan Losu's traditional house in Kamhua Noknu, 2024

Two teenage YouTubers were enrolled as camerapersons and recorded accounts by family members in an informal, unselfconscious manner. These videos were edited into a short film (Douglas 2024d). By now the telling had become part of the story, and the project required me to reflect on how my presence would be part of the collective memory.

The Villages

The Wancho villages (*nok*) are dense settlements typically isolated from one another. Four were selected for this architectural study: Kamhua Noknu, Kamhua Noksa, Khasa, and Jagan.

The villages are situated high on mountainsides, generally facing south, so as to facilitate defense in the days when feuds would lead neighboring villages to raid one another. These conflicts would sometimes escalate into war, accounting for the popular imagery of Wancho warriors and headhunters. When the population grew, some villagers would leave and settle elsewhere. The need for protection resulted in alliances between “senior” and “junior” villages, and thus

Kamhua Noksa is junior to Kamhua Noknu. Almost all of the houses here are of traditional design, but each year traditional dwellings are replaced by modified structures, such as the permanent buildings in Kamhua Noknu and neighboring villages built of concrete or galvanized iron panels. Each village is ruled by a chief referred to as *Wangham* (or *Raja*). The village council consists of the *Wangham*, his assistant and announcer (*Ngopa*), the council of elders (*Wangchu-wangcha*), and the *Gaonbura* (government nominee). The council is responsible for village administration and implementing customary laws for the sustainable use of forest resources (Singh and Popli 2020).

Wancho Architecture

Wancho architecture is similar to that of the neighboring Naga tribes, and especially the Konyak, who have many cultural affinities with the Wancho. Their buildings, classifiable in the *kutch*a type, are made of renewable unprocessed organic materials, and as wood, bamboo, palm leaves, etc. are readily available, construction costs

are minimal. A traditional home has a wooden frame structure, and if it is built on a slope, at least part of it—usually the rear—is elevated on bamboo stilts. Their typical dimensions are 10-15 meters long by 4-5 meters wide. Though rectangular, they often have an apsidal curve at the front, covered by the rounded thatched rain shield of the veranda (*jaotha* in Wancho). A house typically has 2-4 openings in its front, back, and side walls.

Traditional houses have a post-and-beam structure on earth, with supports of timber or bamboo. The central columns are highest, extending above the roof; this extra length is left uncut so that the base, which decays quickly in contact with the soil, can be cut off periodically. The wood used for house construction is obtained from the forests of the hills adjoining the villages, and more recently is grown in private gardens. Wood is reused as far as possible when a house is rebuilt. The roof is thatched, sufficiently to keep the dwelling dry, and the walls are built of split bamboo framing and woven bamboo matting. At least six varieties of bamboo are used in Wancho housebuilding, harvested, like palm leaves, at specific stages of the lunar cycle, in the last few days (*Lenmah*) or in the middle (*Nyek-cha-tak*), as this is believed to reduce insect attack.

The Traditional Wancho House

A traditional Wancho dwelling is a large, hand-built structure with a character and features that reflect the dwellers’ lifestyle, customs, and socioeconomic status. The shelter and security provided by such houses is expressed in a saying recorded by Jatang Pansa in Khasa village: *Oloh phang ma kam, oloh phang ma shah* (We come together under a thatched roof, and we eat our fill under a thatched roof).

On approaching the front of a house, a visitor immediately notices the tradition of artistic decoration with buffalo and mithun (*bos frontalis*) skulls.

The larger wall, usually about two-thirds of the width of the house, is the *waknu*, and it is here that the skulls of domestic animals slaughtered by the household are displayed as mementos of past feasts. The *waksa* is the smaller wall, usually to the left, decorated with the skulls of wild animals as hunting trophies.

The spacious interior is partitioned by walls of woven bamboo into sections according to function. The front room (*chingkha*) contains the rice-pounding table (*tham*), used by women, and serves as a public space. The house is separated into male and female areas, and its main section is the kitchen (*phongkha*).

Regarded as the women’s domain, where food is cooked over a wood fire, this is a place for gathering and conversation. Life in the village is lived either outdoors or by the fireside. Although the high ceilings in the living area let in natural light and fresh air, little electricity is available and the houses tend to be dark. Light and heat are provided in the living space by the prominent hearth. Wancho houses are heated by wood and typically have two fireplaces: *phongnu* and *phongs*a. The *phongnu* is the main fireplace for cooking rice and vegetables; fish and meat are usually cooked on the *phongs*a. A bamboo/wooden rack (*hading*) is suspended over the hearth for drying and storing meat, grain, firewood, and tools. As Wangjay Losu explains: “Men should sit at this place (*phongs*a); this is our Wancho tradition, which we still practice and follow closely.” The houses are animated by residents’ activities and stories told by the fireside.



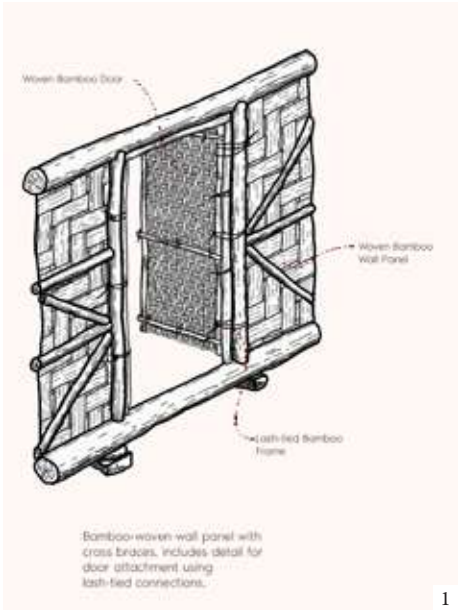
1. Buffalo skulls on the waknu of the nyalem paa in Kamhua Noksa in 2023
2. Phongkha (kitchen) of the wangkam, Kamhua Noksa, 2023
3. Hading (drying rack) in the phongkha (kitchen) of the wangkam, Kamhua Noksa, 2023
4. Ponwang Losu seated in the nyoi (room for elderly people) in the Wanchos family house in Kamhua Noknu, 2023

A common practice is for elderly men to have a separate room (*nyoi*). As Ponwang Losu explains: “It is not that one who sits like this is alone. Every elderly man has a separate room, designed for older people. They want a warm place to sit in and don’t always want to mix with the rest of the family in the *phongkha* (kitchen).” (Douglas 2024h).

In the open-plan interiors of traditional homes, families prefer to sleep close together in the *kamkey* (back room). Washrooms and pig sheds are built away from the main house to keep out damp and maintain hygiene indoors. Water is supplied at outdoor taps and in communal areas. The village chief’s house stands out as larger than the rest.



Wapan base beam dividing the phongkha from the kamkey (back room) in Hondan Losu’s house, Kamhua Noknu, 2023



1. Detail of door and woven bamboo walls (Arnav & Anupama Architects)
2. Completing the reconstruction of the wangkam (chief’s house) in Kamhua Noknu in 2021
3. Ogeeko process of wrapping the central ridge pole (ochung), Kamhua Noknu, 2023

Construction Processes

The first phase of building is performed by the homeowner’s close relatives. Once a decision is made to build or rebuild a house, the materials are stockpiled over more than a year: large amounts of wood, bamboo, palm leaves, and bamboo string. The site is prepared by digging and leveling to make the base floor, and on the first day of construction the *wapan* is fitted—a horizontal base beam installed in the front third of the house.

Exterior and interior structural columns to support heavy roof beams are erected, followed by layers of bamboo roof framework. On the second day, the roof is finished with a thick layer of palm-leaf thatch and the walls, exterior and interior, are fashioned usually from woven bamboo. On the

third day, the room partitions are erected and the bamboo floor is woven and put in place in the *kamkey* (back room).

In any culture, dwellings are linked to economic needs, cultural values, and social relationships. So it is with traditional Wanchos architecture, which is moreover eco-friendly building with its use of local resources, low energy consumption in material preparation and transportation, and reuse and recycling of materials. Until recently there was no cash economy in Wanchos villages, so transactions took place by barter and exchange. Thus housebuilding, certainly one of the most expensive undertakings for a family, involves the gathering of local materials and the skills and cooperative building practices through which people help each other and in turn expect and receive help. Community participation in all major village tasks

and activities including building reflects a collective spirit and a cultural embodiment of this architecture. Yet the availability of imported products has now led a few rudimentary general shops to be set up in the villages, and purchased materials are brought in by vehicles that ply daily to Longding.

The building of a house involves a series of choreographed actions and roles, each with a synchronized routine. Building skills are acquired through a learning system in which the process is guided by experienced craftsmen. Every component of a traditional house has a local name describing its location and function which is recalled as the piece is erected, so that its position is understood and the knowledge transferred to the next generation. The strongest boys and young men perform the physical tasks of gathering materials from the forest or farm as well as the heavy work of erecting the frame, weaving the walls and floors, and building the roof. Older men prepare the leaves for thatching and cut the sticks used to pin the palm leaves when wrapping the central ridge pole (*ochung*), a process called *ogeeko*. The housebuilding event is a noisy, amicable affair that brings the community together, and the hard work is rewarded by a feast laid on by the owner on the second day.

Discussion and Conclusion

The traditional architecture of the Wancho community is linked to a sense of identity deeply connected with the regional geography—connections to the land that are explicit in the community’s oral history, myths, and folklore. Underlying this are ancestral animist traditions defining webs of human relationships extending from the family, clan, and village to embrace natural and supernatural entities (Hallowell 1960; Bird-David 1999; Ingold 2006:10). In the Wancho imagination, the entire landscape is animated by stories, and the place for telling them is by the fireside in a traditional house.

A subsistence farmer depends on the soil, climate, and knowledge accumulated through observation of the environment, as well as on solidarity established through relationships of cooperation. The integrity and identity of shelters in Wancho settlements are bound up with this way of living and a culture which emphasizes family values and community belonging and cohesion. Entering a local house gives us an insight into a timeless, enduring resilience; a way of life involving know-how in practices such as farming, hunting, rituals, crafts, and feasting. The custodians of knowledge in the villages are versed in the

properties and uses of plants for nutrition, medicine, rituals, and housebuilding. This collective memory is essential for adherence to sacred traditions that sustain lifecycles and conserve natural resources through rituals and prescribed times for harvesting.

A study of architecture isolated from indigenous philosophy and cultural practices would be incomplete, for in the Wancho psyche, mountains, rivers, and forests are perceived as animate; even certain stones, trees, plants, insects, and animals are seen as dynamic forces to be embraced and transformed. This inclusive mindset is linked to the nurturing of reciprocal relationships between humans and with diverse entities encountered in the non-human ecosystem. For instance, in one traditional story, a sacred bamboo grove near Nyinu village is associated with ethereal ancestral beings, and when the bamboo is cut these guardian spirits die, impacting the wellbeing of humans. These relationships are sustained through place-specific rituals of “reinspiring” that maintain balance and good relations, honoring and integrating human connections with the world (Studley 2019). In this environment, hand-built dwellings in the Wancho tradition are more than assemblages of materials. In the village, the *Gampa* (traditional priest), called upon to cure ailments attributed to the influence of harmful spirits, was also engaged to perform *kamdong* rituals to drive away evil spirits attracted to a newly built house (Douglas 2024c). Many traditional customs remain ingrained and continue to be practiced, showing how Wancho society maintains multiple, often contradictory ontologies simultaneously (Fowles 2010:8).

These buildings do not require preservation in the conventional sense; like Wancho stories, they exist as both a process and an artifact, an ongoing cycle of construction

and reconstruction. Fabio Bacchini (2018) proposes that architectural works are performances or processes rather than mere material objects. Buildings made of ephemeral materials are outcomes of architectural events encompassing erection, endurance, and eventual decay. Decay sets the stage for reconstruction, an occasion to assemble the community for a coordinated series of activities that repeat the performance. Hence, as part of an animate landscape including the annual cycle of seasonal change, Wancho architecture is in constant transformation. A traditional Wancho house requires periodic reconstruction, but each new structure is built on the site of a previous one, reflecting a deep-seated continuity, as families remain at the same location for generations, with little inclination to move away.

These houses are living examples of resilient thinking (Walker and Salt 2006), incorporating subtle indigenous innovation. The beauty of the Wancho house lies in its quick construction using local, organic materials that are not only biodegradable and environmentally friendly but also reusable, ensuring sustainability. Housebuilding reinforces community values and supports local knowledge in a performance of customary practice, reciprocity, participation, and transmission via songs and rituals. Through such communal activities, Wancho customs are revitalized, sustaining a way of life and a moral and cultural code that is understood collectively. The potential impact of its loss was expressed by Jatwang Wangsa: “People gather during the reconstruction of the chief’s house and this leads us to discuss traditions and culture. Traditional songs and dance are also part of it, and all this gets lost when a building becomes a permanent structure; but people now prefer to build modern tin-roof houses.”



Drone view of front of the wangkam in Kamhua Noknu, 2023 (Angam Wangpan)



Drone view of the wangkam roof, Kamhua Noknu, 2023 (Angam Wangpan)

Plan of the wangkam in Kamhua Noknu (Arnav & Anupama Architects)



Vernacular architecture contains significant social, cultural, and heritage values, which the abandonment of the Wancho building tradition would profoundly impact. Housebuilding makes villagers come together and cooperate, sharing food and strengthening social bonds in a reenactment of practices that revive family and neighborly relationships, and whose loss is feared by village elders. Social equilibrium is also being disrupted as modernization diminishes the workforce needed for traditional rice cultivation, and the rudimentary standard of government education in most rural areas leaves youngsters unqualified for employment. Reluctant to pursue traditional livelihoods, they question the relevance of ancestral knowledge, leading to a breakdown in intergenerational communication. Thus knowledge is becoming vulnerable, endangering the continuation of traditional building. The younger generation aspire to novelty in their changing way of life, challenging the continuity of their heritage.

Village settlements are evolving quickly as homeowners show a preference for new-style houses. The modern adaptation of the traditional house, with a frame elevated on large stones, has become popular among many families due to its durability as compared to the original format, in which columns and posts are set directly in the soil. Younger generations are also interested in further modifying the house structure, with some envisioning homes built of concrete. Even so, the design of kitchens is likely to remain unchanged for the foreseeable future, as a kitchen supports traditional meal preparation and socializing in the Wancho family setting.

Inevitable changes are occurring due to greater access to information, but these developments do not render the advantages of a traditional way of life irrelevant. Specialist architectural documentation has prompted discussions among villagers about the continuation of certain practices. Most village leaders agree that communal buildings at least should be maintained in the traditional style, as Jatwang Wangsa explains:

People living in the village have deep interconnections; they help each other out when needed. Especially the *paa* and the chief’s house should remain traditional, as otherwise we will lose the songs and dance which are part of the construction event. We have the chance to get together whenever it is rebuilt.

The future of these traditions must navigate opposing perspectives: a romantic view that demands preservation at all costs, and a techno-optimism that relies on science and technology to address the ecological consequences of unchecked growth (Alexander and Rutherford 2019). In Arunachal Pradesh the state government intends to promote homestay hospitality and eco-tourism, harnessing the benefits of tourism while minimizing its impact. This in turn raises concerns about the evolving role of traditional houses when modified for tourists, as critics argue that they

thereby lose their vernacular essence. Moreover, various studies highlight the sustainability lessons that can be learnt from vernacular architecture (Kazimee, 2008; Nguyen et al., 2019). The Lo-TEK movement emphasizes the use of traditional or non-mechanical technology, such as craft and hand tools, and the low-tech methods of Wancho vernacular architecture certainly demonstrate how buildings and their environments may be suited to local climate and culture, as an alternative to modern designs that often disregard local conditions.

The Wancho community shows resilience in adapting to the challenges of their rugged terrain, with traditional laws for managing resources and preventing deforestation or restoring woodlands. Their cultivation and use of regenerative materials and recycling of wood further reduce pollution and human impact. The low energy demand and resource-efficient design of traditional Wancho architecture offer a sustainable alternative to the high demands and inefficiency of modern methods, which strain local water sources and energy supplies.

Modern adaptations illustrate how this architecture grows with the community, and recommendations stemming from this study could serve as a reference for the design of adapted buildings. Traditional Wancho structures are highly responsive to their environment, minimizing the use of energy-intensive materials such as steel and concrete. New construction practices should integrate local technologies and materials, more affordable and readily available as compared to imported industrial products.

References | Referencias | Referências

Alexander Samuel, and Rutherford, Jonathan, 2019. A Critique Alexander, Samuel; and Rutherford, Jonathan. 2019. A Critique of Techno-optimism. Efficiency without sufficiency is Lost. *Handbook of Global Sustainability Governance*. London: Routledge.

Bacchini, Fabio. 2018. The Ontology of the Architectural Work and its Closeness to the Culinary Work. *City, Territory and Architecture*, 5, 21.

Bird-David, Nurit. 1999. Animism “revisited”: Personhood, environment, and relational epistemology. *Current Anthropology*, 40: 67-91.

Das, Bishwajit. 2023. Language Ecology in Northeast India: An Overview. *IJNRD*, 8, 4.

Douglas, Tara. 2024a. *Building a Frame House with Khaupa Wangham*. https://youtu.be/sD83c0Gh_fI (consulted on 02/02/2025)

Douglas, Tara. 2024b. *Pasa (a small house for teenagers)*. <https://youtu.be/tgQplcQzJag> (consulted on 02/02/2025)

Douglas, Tara. 2024c. *Kamdong Ritual*. <https://youtu.be/v3KifsC-HTU> (consulted on 02/02/2025)

Douglas, Tara. 2024d. *We are the Geyam Family*. <https://youtu.be/k-zl8PHP860> (consulted on 02/02/2025)

Douglas, Tara. 2024e. *Documentation of traditional architecture in the Wancho villages in Arunachal Pradesh*. <https://youtu.be/N5sxaec6EGc> (consulted on 02/02/2025)

Douglas, Tara. 2024f. *3D architectural modelling by Phowang Losu*. https://youtu.be/6kz3_z8V8UY (consulted on 02/02/2025)

Douglas, Tara. 2024g. *Vernacular architecture and sustainability*. https://youtu.be/kleq4G_wLeA (consulted on 02/02/2025)

Douglas, Tara. 2024h. *Wancho Nyoï (a small room for elder people)*. https://youtu.be/_ygfjIDtmas?feature=shared (consulted on 02/02/2025)

EWAP. 2025. *Projects - Traditional Architecture in the Wancho Villages (India)*. <https://ewap.brookes.ac.uk/report/6dacf7d8-8660-494c-bfb9-601484a62d0e> (consulted on 02/02/2025)

Fowles, Severin. 2010. Animist/Analyst. *Annual Meeting of the Theoretical Archaeology Group*. Providence: Brown University.

Hallowell, Irwin A. 1960. Ojibwa Ontology, Behavior and World View. In Diamond, S. (ed.), *Culture in History: Essays in Honor of Paul Radin*. New York: Columbia University.

Ingold, Tim. 2006. Rethinking the Animate, Re-animating Thought. *Ethnos: Journal of Anthropology*, 71, 1: 9–20.

Kazimee, Bashir A. 2008. Learning from Vernacular Architecture: Sustainability and Cultural Conformity. *WIT Transactions on Ecology and the Environment*, 113: 3-13.

Nguyen, Anh Tuan; Ha Truong, Nguyen Song; Rockwood, David; and Tran Le, Anh Dung. 2019. Studies on Sustainable Features of Vernacular Architecture in Different Regions across the World: A Comprehensive Synthesis and Evaluation. *Frontiers of Architectural Research*, 8, 4.

Singh, Sanjeev; and Popli, Saurabh. 2020. Phenomenology of Vernacular Environments: Wancho Settlements in Arunachal Pradesh, in the north east of India. *Journal of Traditional Building, Architecture and Urbanism*, 1. <https://doi.org/10.51303/jtbau.vi1.377>

Stocking, George W. 1983. *Observers Observed. Essays on Ethnographic Fieldwork*. Madison: University of Wisconsin.

Studley, John. 2019. *Indigenous Sacred Natural Sites and Spiritual Governance*. London: Routledge.

Vellinga, Marcel, 2011. The End of the Vernacular Anthropology and the Architecture of the Other. *Etnofoor, Architecture*, 23, 1: 171-192.

Walker, Brian; and Salt, David. 2006. *Resilience Thinking, Sustaining Ecosystems and People in a Changing World*. Washington, D.C.: Island Press.

Biography | Biografía | Biografia

Tara Douglas

Tara was awarded a Professional Doctorate in Digital Media at Bournemouth University for *Tales of the Tribes: Animation as a Tool for Indigenous Representation* (2016). She is co-author with Jatwang Wangsa of *Myth, Memory and Folktale of the Wancho Tribe of Arunachal Pradesh* (Niyogi Books 2024). She is Secretary of the Adivasi Arts Trust (UK) and Principal Investigator of the project titled *Documentation of traditional architecture in the Wancho villages in Arunachal Pradesh* (2023-2024), hosted by the Adivasi Arts Trust and supported by the Endangered Wooden Architecture Programme at Oxford Brookes University and the Arcadia Foundation.



Book Reviews

Reseñas de libros

Revisão de livros

- 400

New Buildings in Old Cities: Gustavo Giovannoni Translated in English

Edificios nuevos en ciudades antiguas: Gustavo Giovannoni traducido al inglés

Novos edifícios em cidades antigas: Gustavo Giovannoni traduzido para o inglês

Claudio Varagnoli
- 400

Rural in the Plural

Rural en plural

Rural no plural

David Escudero
- 401

A Window into Cuba’s Soul: Exploring the Hidden Beauty of Cuban Courtyards

Una ventana al alma de Cuba: Explorar la belleza oculta de los patios cubanos

Uma janela para a alma de Cuba: Explorar a beleza oculta dos pátios cubanos

Ricardo Álvarez-Díaz
- 402

Sitte and the Aesthetic Dimension of the City

Sitte y la dimensión estética de la ciudad

Sitte e a dimensão estética da cidade

María Pura Moreno Moreno
- 402

Art For All

El arte para todos

A arte para todos

Luis Prieto Prieto
- 403

Portuguese Regional Architecture

Arquitetura regional portuguesa

Arquitetura regional portuguesa

Inês Cunha Simão
- 404

Drystone Walling, a “Dying Art” with a Living Language

La construcción en piedra seca, un “arte moribundo” con un lenguaje vivo

Construção em pedra seca, uma “arte em extinção” com uma linguagem viva

Bob Powell
- 404

Heritage Made by Hand

De la mano al patrimonio

Patrimônio feito à mão

Julián García
- 405

The Alhambra in Drawings

La Alhambra dibujada

A Alhambra desenhada

Pedro Barrero Ortega
- 406

Talking about Architecture

Conversando sobre arquitectura

Conversando sobre arquitetura

Alejandro Valdivieso
- 406

Echoes of the Past: Segregation and Space in the Bight of Biafra

Ecos del pasado: Segregación y espacio en el Golfo de Biafra

Ecos do passado: Segregação e espaço no Golfo de Biafra

Zicheng (Roy) Zhang
- 407

Constructing Continuity: From Craft to Traditional Urbanism

Construir la continuidad: Del oficio al urbanismo tradicional

Construindo a continuidade: Do ofício ao urbanismo tradicional

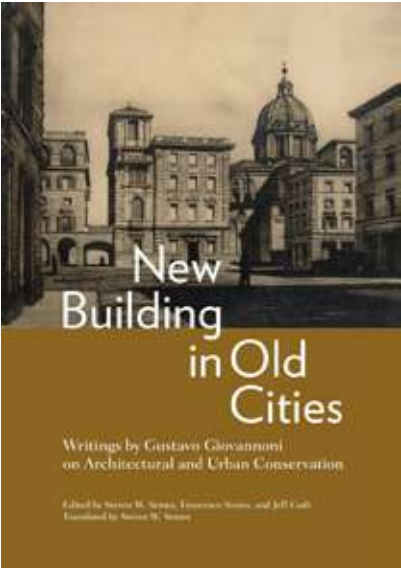
Wesam Al Asali
- 408

How to Make a Great Facade, Venetian Style

Cómo hacer una gran fachada, a la veneciana

Como fazer uma grande fachada, ao estilo veneziano

Matthew Bell



New Buildings in Old Cities: Gustavo Giovannoni Translated in English

Edificios nuevos en ciudades antiguas: Gustavo Giovannoni traducido al inglés

Novos edifícios em cidades antigas: Gustavo Giovannoni traduzido para o inglês

Claudio Varagnoli

This work fills a gap in architectural history studies. Engineer, urban planner, historian, and restorer, Gustavo Giovannoni (1873-1947) played a key role in Italian and European culture in the first half of the twentieth century but is substantially unknown to Anglophone readers. This volume, sponsored by the Getty Conservation Institute, brings together thirty of Giovannoni’s essays, excellently translated by Steven W. Semes and accompanied by short commentaries and illuminating visual summaries.

A profound connoisseur of ancient and Renaissance architecture, Giovannoni

founded the first Italian Faculty of Architecture, roughly when Gropius was reestablishing the Bauhaus in Weimar. But while Gropius ruled out the teaching of architectural history, given his commitment to a radical renewal, Giovannoni devised a method for studying, protecting, and restoring monuments and cities that he saw as threatened in those rapidly changing times. But rather than confining himself to a nostalgic view, Giovannoni sought a compromise that might allow cities’ heritage to live on.

The three editors of this anthology thus envisage Giovannoni’s thinking projected into the future, in line with the view taken by recent literature. Alongside his overhaul of the discipline of restoration in urbanism—for he was the promoter of the 1932 Italian Charter for Restoration—Giovannoni advocated respect for the morphological organization of historic cities, even at the cost of a selective thinning-out of historic fabric (*diradamento*) to allow modern life to unfold. In his designs for new buildings, Giovannoni sought to realize the potential of traditional language, drawing on his profound knowledge of architectural history. He was able to design neighborhoods such as Garbatella (1920) and the “garden city” of Montesacro (1920) in Rome, free of rigid geometries and informed by local tradition. Giving a twist to the title of a famous Giovannoni essay (*Città vecchia ed edilizia nuova*, 1913), the editors thus offer us a tool for reflecting on new construction in historic contexts while looking at old cities as models for new sustainable development.

Steven W. Semes, Francesco Siravo and Jeff Cody (eds.)
New Buildings in Old Cities. Writings by Gustavo Giovannoni on Architectural and Urban Conservation
Getty Conservation Institute, 2024



Rural in the Plural

Rural en plural

Rural no plural

David Escudero

Esta obra coral propone una aproximación colectiva a dos conceptos cada vez más interrelacionados en las disciplinas dedicadas al estudio del territorio: el paisaje y el patrimonio. A través de una pluralidad de enfoques centrados principalmente en entornos rurales, el libro explora la evolución de ambos conceptos en las últimas décadas y subraya su creciente transversalidad y la sensibilidad con que hoy se abordan en relación con los contextos sociales, culturales y políticos contemporáneos. Lejos de ofrecer definiciones cerradas o discursos unívocos, plantea una reflexión abierta que resalta la dimensión relacional, subjetiva y contingente del patrimonio en el medio rural, así como los retos inherentes a su gestión, interpretación y representación en la actualidad.

El contenido se organiza como un diálogo interdisciplinar –entre la arquitectura, la arqueología, la geografía, la historia del arte o la antropología, entre otras disciplinas– que desborda los marcos analíticos convencionales

y establece conexiones inteligentes entre los distintos capítulos. La suma de estas aportaciones pone en valor un enfoque crítico que se distancia de visiones esencialistas o nostálgicas y apuesta por lecturas situadas, inclusivas y comprometidas con la complejidad del presente. El libro destaca, además de por su cuidada edición, como fruto editorial del Centro de Investigación de Arquitectura Tradicional (CIAT), que celebra con esta publicación su vigésimo quinto aniversario y sintetiza con acierto sus líneas de trabajo, experiencias y reflexiones acumuladas a lo largo de más de dos décadas. En definitiva, constituye una aportación valiosa para repensar el entorno construido desde la pluralidad, la crítica y la vocación transformadora del paisaje como bien patrimonial.

Jaime de Hoz, Gabriel Hernández, Fernando Vela Cossío y Diana Zárate-Zúñiga (eds.)
Paisaje y patrimonio: miradas contemporáneas
Ediciones Asimétricas, 2025



A Window into Cuba’s Soul: Exploring the Hidden Beauty of Cuban Courtyards

Una ventana al alma de Cuba: Explorar la belleza oculta de los patios cubanos

Uma janela para a alma de Cuba: Explorar a beleza oculta dos pátios cubanos

Ricardo Álvarez-Díaz

Cuban architect and professor Julio César Pérez’s *Courtyards of Cuba* is a captivating work on Cuba’s architectural heritage, delving into the evolution, significance, and singularity of courtyards in Cuban urbanism. The volume traces the historical roots of courtyard architecture, highlighting its origins in Spanish colonial influences and its adaptation to Cuban culture.

One of its strengths is a detailed analysis of *patios* and *traspacios* as features of Cuban colonial houses that set them apart from other Latin American dwellings. Unlike most traditional houses across the region, many Cuban homes have two courtyards, each

serving specific functions and with vital roles linked to the local climate. This book shows how these spaces are crucial for cross ventilation, light distribution, and domestic activities, tracing the interconnections between architecture and the environment.

Pérez’s historical context is compelling, illustrating how Cuba’s strategic location and colonial history have shaped its urban landscape. His narrative nicely combines architectural evolution with cultural transformation, given that as well as serving practical purposes courtyards have held symbolic significance. From the colonial settlements of the sixteenth century to the modernization of the twentieth century, Pérez gives a comprehensive overview of how courtyard architecture has adapted to changing social and political climates.

He also considers concerns about the decline of traditional Cuban architecture in modern times. Contemporary architects’ and students’ scant appreciation of historical architectural principles is a challenge in preserving this unique heritage.

This is an excellent, meticulously researched work with striking visuals that will appeal to architecture enthusiasts, historians, and anyone interested in Cuban culture. The author illuminates a fascinating yet often overlooked aspect of Cuba’s architectural identity, advocating for the preservation of these historic spaces.

Julio César Pérez
Courtyards of Cuba
Andelani Press, 2025



Sitte and the Aesthetic Dimension of the City

Sitte y la dimensión estética de la ciudad

Sitte e a dimensão estética da cidade

María Pura Moreno Moreno

La entusiasta editorial germinArq se ha dedicado, en su selectiva trayectoria, al rescate de ciertos textos fundacionales de autores consagrados de la historia del urbanismo y la arquitectura. Su objetivo no es otro que reunir en torno a sus títulos a un selecto grupo de lectores que anhelan acceder al conocimiento íntegro de teorías que, aunque infinitamente citadas, rara vez han sido leídas en su totalidad.

Su publicación más reciente, *Construcción de ciudades según principios artísticos* de Camille Sitte (1843-1903), supone el rejuvenecimiento de la excelente traducción al español del célebre texto del urbanista vienés realizada por Emilio Canosa en 1926. Los lectores que se acerquen a esta cuidada edición se encontrarán con el Sitte que reivindicaba las enseñanzas de la ciudad construida y que apelaba a un empirismo urbanístico en oposición al racionalismo parcelario

emergente de las últimas décadas del siglo XIX.

En el contexto actual del debate sobre la ciudad de los quince minutos o la peatonalización de los entornos urbanos, resulta oportuno ofrecer a las nuevas generaciones este texto elaborado por aquel arquitecto viajero que, al observar la materialidad de lo construido, se interrogaba sobre la dimensión estética de determinados lugares o de encrucijadas transformadas en plazas en las ciudades heredadas. Sus reflexiones teóricas, arraigadas en la propia disciplina arquitectónica y acompañadas de dibujos sintéticos de plantas urbanas, subrayan la importancia de comprender las relaciones espaciales y las formas urbanas como elementos que configuran el carácter de paisajes urbanos y territoriales cuya belleza se ha consolidado a lo largo de la historia.

En definitiva, como señala Víctor Pérez Escolano en el erudito prólogo, la relectura de este texto de Sitte no pretende “reencarnar formas y espacios pretéritos, sino mirar al futuro con propósitos de progreso en los que la dimensión estética de la ciudad y del territorio sea una componente esencial”. Solo por ello, puedo asegurar que merece, y con creces, una lectura atenta e íntegra que continúe permitiendo citas precisas.

Camille Sitte
Construcción de Ciudades según Principios Artísticos
Editorial germinArq, 2024



Art For All

El arte para todos

A arte para todos

Luis Prieto Prieto

El libro describe la técnica del esgrafiado en Barcelona. Según el *Diccionario del estudiante* de la RAE, esgrafiar consiste en trazar dibujos sobre una superficie mediante la superposición de dos o más capas de distinto color y el raspado posterior de una de ellas hasta dejar a la vista la capa deseada.

La portada de esta excelente obra, en cartoncillo gofrado que reproduce la textura de un esgrafiado, anticipa la sutileza de su contenido. El formato resulta muy cómodo, con un tamaño adecuado, además de estar impreso a todo color. Lo publica el Ayuntamiento de Barcelona dentro de la colección *Arts a la ciutat* e incluye una hoja suelta, que puede utilizarse como marcapáginas, firmada por Jaume Collboni Cuadrado, alcalde de Barcelona.

La mirada del artista Lluís Durán se refleja en las fotografías realizadas en invierno, con el cuidado de evitar que el follaje de los árboles oculte los esgrafiados. Cada página del libro muestra una imagen de estas fachadas, acompañada de un código QR que

remite a su localización. El volumen está perfectamente organizado en su marco histórico por Daniel Pifarré y ordenado por distritos, con planos de referencia. Cabe esperar, quizá, una segunda parte dedicada a los esgrafiados de interiores. La técnica es explicada por Joan Casadevall i Serra desde la perspectiva de un artesano, quien además ofrece su visión sobre la pérdida y el posible futuro de estos oficios aún no reglados.

Este libro sólo ha sido posible gracias a que el verdadero protagonista, el esgrafiado, se conserva en perfectas condiciones para ser fotografiado. La obra pone de relieve el excelente trabajo de los vecinos de Barcelona que, en la confluencia histórica de diversos factores, como la política, los gremios y una sólida cultura cívica, dieron lugar a este bello conjunto tan bien preservado.

Son pocas las ciudades que podrían publicar un libro de estas características, ya que en la mayoría de los casos sus esgrafiados han sido mal conservados o destruidos. Es una iniciativa que merece ser replicada, y, en ese sentido, animo a los ayuntamientos a emprender proyectos similares, con la certeza de que igualar lo logrado en Barcelona será casi imposible.

Lluís Durán
Barcelona Esgrafiada
Ajuntament de Barcelona, 2025



Portuguese Regional Architecture

Arquitectura regional portuguesa

Arquitetura regional portuguesa

Inês Cunha Simão

The most important record of vernacular architecture in Portugal is here republished in a facsimile edition, 64 years after its first publication.

In the 1950s, the Portuguese National Union of Architects performed a systematic survey of vernacular architecture. Covering all of mainland Portugal, this pioneering study was carried out by eighteen architects and countless architecture students, who documented traditional architecture with more than 10,000 photos, rigorous building surveys (including of materials and construction methods), hundreds of drawings, and thousands of notes, across the six regions into which they divided the country. The results of this innovative approach were published so that this major contribution to the understanding of traditional Portuguese architecture, demystifying the problem of the “Portuguese house” raised by

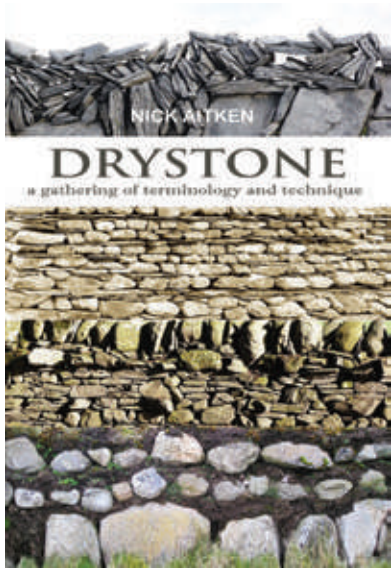
Raul Lino, would be available for future research.

Their unique analysis, with the methodological and scientific rigor of academia, yielded a reliable record of the anthropological, cultural, and social peculiarities of each region, elucidating the physical and human conditions influencing regional architecture.

The subsequent four reissues consolidated this record as a comprehensive inventory of traditional architecture, of the techniques and knowledge being lost to modernity and yet containing invaluable wealth. With great heritage value, this initiative remains the only systematic documentary record of vernacular construction in Portugal.

This reissue is the product of a partnership between the *Público* newspaper, the Portuguese Institute of Architects, and the publisher A Bela e o Monstro. It comes in twelve booklets each of some sixty pages, with a hard cover, dust jacket, and slipcase.

Francisco Keil do Amaral (coord.)
Arquitectura popular em Portugal
A Bela e o Monstro, 2025



Drystone Walling, a “Dying Art” with a Living Language

La construcción en piedra seca, un “arte moribundo” con un lenguaje vivo

Construção em pedra seca, uma “arte em extinção” com uma linguagem viva

Bob Powell

Wherever you live, your culture will surely have embraced drystone construction. From the Paleolithic onwards, humans have had an intimate relationship with the world’s most abundant natural material—stone—in rural, urban, and other cultural environments. This geologically variable and flexible resource has served for building shelters, boundaries, monuments, and once even in making the tools by which it was worked. As Nick Aitken’s book shows, stone lends itself to “dry” construction in culturally diverse features with no need for a binder.

Contrary to the figurative sense of the word, *Drystone: a gathering of terminology and technique* is anything but “dry”. It is

a well-illustrated, 370-page volume, the engaging product of Nick Aitken’s years of practical and research experience as a master craftsman in the UK and abroad. Each informative page is profusely referenced and accompanied by an exploration of the associated history along with facts and figures. Worthy of being published alone, the bibliography is truly comprehensive, and the inclusion and interpretation as Appendix One of the ode “Davie The Dyker” is inspired, and together with Appendix Two, “The Mole Song,” adds much to the volume’s appeal.

Nick Aitken’s book will appeal to practitioners and anyone, such as archaeologists, conservation architects, local historians, folklorists, academics, or aspiring drystone “dykers,” interested in this ancient craft. This is much more than a compendium of drystone terminology, delving comprehensively into all aspects of the associated culture.

If you have ever noticed drystone walls and buildings in the landscape, and even if not, this outstanding book will inform, enlighten, and kindle curiosity.

Nick Aitken
DRYSTONE: A gathering of terminology and technique
Tippermuir Books, 2025



Heritage Made by Hand

De la mano al patrimonio

Património feito à mão

Julián García

El escritor, dibujante y escultor Miguel Sobrino (1967) reúne en *Leer a mano* textos breves sobre artes, oficios y patrimonio. Autor también de *Catedrales* (2009), *Monasterios* (2013) y *Castillos* (2022), compila aquí apuntes sobre diversos temas –pintura, escultura, arquitectura, mitología o historia– escritos con trazo de narrador; su tono y cadencia remiten al cuento o la parábola. Esto le permite rehuir la rigidez académica e interpelar a todos, no sólo a los especialistas. Con un puñado de ejemplos bien escogidos logra iluminar asuntos aparentemente complejos, que gracias a su relato se revelan con claridad.

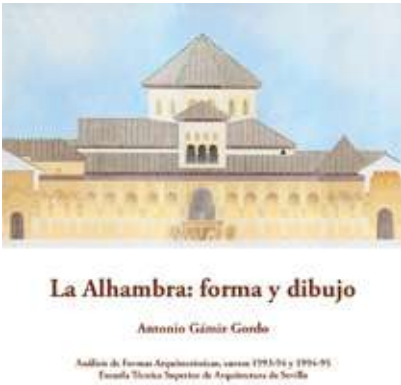
A veces estos ensayos son impresiones de viaje; otras, reflexiones suscitadas por lecturas recientes. Aunque parecen dispuestos sin un orden definido, los atraviesan hilos ocultos: la figura de Miguel Ángel, por ejemplo, emerge en notas sobre la talla de la Piedad o en una visita imaginada a la Atenas de su tiempo; la forma en que hoy se interpreta la Edad Media enlaza miradas sobre París, Atenas o Madrid; la piedra, material con

el que Sobrino trabaja como escultor, da pie tanto a reflexiones sobre la vigencia del trabajo manual frente a las muletas digitales como a apuntes sobre lo que entendemos por eficiencia energética.

Leer a mano no busca una aproximación completa ni sistemática a estos temas, pero encierra una visión muy clara de lo que debe ser la conservación del patrimonio. Una visión que el autor construye desde lo pequeño –la materia y las herramientas básicas con que contamos para transformarla– hasta lo grande: la ciudad, su transformación, la forma en que la habitamos.

El lector encontrará, en fin, una amenísima antología de relatos, pero también una guía lúcida para entender qué es el patrimonio y, sobre todo, para reflexionar juntos sobre cómo cuidarlo y vivirlo.

Miguel Sobrino González
Leer a mano. Textos breves sobre artes, oficios y patrimonio
La esfera de los libros, 2025



The Alhambra in Drawings

La Alhambra dibujada

A Alhambra desenhada

Pedro Barrero Ortega

Antonio Gámiz Gordo, profesor del Departamento de Expresión Gráfica Arquitectónica de la Escuela de Arquitectura de Sevilla desde 1990, es un apasionado del dibujo y de la arquitectura. Su tesis, *Alhambra. Imágenes de Arquitectura*, defendida en 1998 bajo la dirección de Rafael Manzano Martos y José Antonio Ruiz de la Rosa, abrió una línea de investigación que ha continuado en numerosas publicaciones posteriores, en las que se refleja su admiración y conocimiento de este conjunto monumental inscrito en la Lista de Patrimonio Mundial de la UNESCO.

Ahora presenta un nuevo libro, *La Alhambra: forma y dibujo*, editado por el grupo de investigación “HUM 976. Expregráfica. Lugar, Arquitectura y Dibujo” de la Universidad de Sevilla, que dirige desde 2015. La obra reúne una cuidada selección de 86 dibujos realizados por sus alumnos en la asignatura Análisis de Formas Arquitectónicas durante los cursos 1993-94 y 1994-95.

En el *Manifiesto de la Alhambra*, Fernando Chueca señalaba que el agua adoptaba allí tres estados naturales: el momento de surgir, de fluir y de estancarse, con formas “elementales y perfectas”: el círculo para el manantial, la recta para el movimiento y el rectángulo para la quietud. Tomando ese valioso libro como referencia, esta publicación reúne diversos episodios formales, representados con múltiples sistemas gráficos y técnicas de dibujo, según la mirada y la sensibilidad de cada autor. Todos los trabajos fueron realizados manualmente, pues en aquellos años los ordenadores aún no habían llegado a la docencia. Se ofrecen como un recorrido visual que oscila entre la percepción paisajística y los detalles arquitectónicos más sutiles. Reflejan, además, el universo mágico evocado en el libro que nuestro maestro Rafael Manzano dedicó a la Alhambra de Granada en 1992.

El libro completo, en formato PDF, puede descargarse gratuitamente en el repositorio IDUS de la Universidad de Sevilla.

Antonio Gámiz Gordo
La Alhambra: forma y dibujo
Universidad de Sevilla, 2025



Talking about Architecture

Conversando sobre arquitectura

Conversando sobre arquitectura

Alejandro Valdivieso

Los profesores e investigadores de la Escuela Técnica Superior de Arquitectura (ETSAM) de la Universidad Politécnica de Madrid (UPM), Alejandro García Hermida y David Rivera –arquitecto e historiador, respectivamente–, reúnen en este volumen, cuidadosamente editado e incluido en la colección *Voces (Serie Arquitectura)* de Ediciones Asimétricas (Madrid), un conjunto de conversaciones publicadas entre 2011 y 2022 como pieza central en los diez números de la revista de crítica de arquitectura *Teatro Marittimo*. Cada una de ellas –y los personajes entrevistados, todos figuras internacionales de primer nivel en el ámbito de la cultura arquitectónica, algunos ya fallecidos– se vinculaba directamente con el tema desarrollado en cada número de la revista.

Reunirlas ahora, habiéndolas releído y revisado en conjunto, ofrece no solo una imagen plausible de lo que aquella

revista fue –con el mérito que supone navegar a contracorriente al editar, con solvencia intelectual e independencia crítica, una publicación que hoy es ya objeto de colección–, sino que incide con perspicacia en aquello que los autores enuncian desde el propio título: la ausencia de paradigma. Al mismo tiempo, estas conversaciones pueden leerse como un libro de viajes: los autores se desplazaron en la mayoría de los casos para encontrarse personalmente con sus interlocutores, empapándose del contexto social y cultural de cada uno de ellos, algo que se refleja tanto en las conversaciones como en los textos introductorios. Todo ello ha permitido que estas páginas resistan el paso del tiempo y la tiranía de la actualidad. No constituyen únicamente el testimonio de un tiempo.

Quien esto escribe entiende que buena parte del valor del libro reside, precisamente, en la elección de las cuestiones planteadas a los entrevistados. Es decir, en seleccionar los temas adecuados, formular las mejores preguntas, conocer qué hay detrás de cada interlocutor, adentrarse en la historia y abordarla con una mirada crítica, recuperando un género –el de la conversación– que siempre estuvo más próximo al ensayo –la conversación ensayística, el diálogo con uno mismo– que al mero *storytelling*. De ahí que el libro busque responder –desplazándose en el tiempo y situándose en el cambio de paradigma posmoderno (¿en qué momento...?)– a los interrogantes que compartimos quienes nos dedicamos a la universidad y a la profesión: ¿qué ocurre con la enseñanza de la arquitectura? ¿Cómo afrontar el problema del patrimonio histórico? ¿Qué ciudad nos espera?

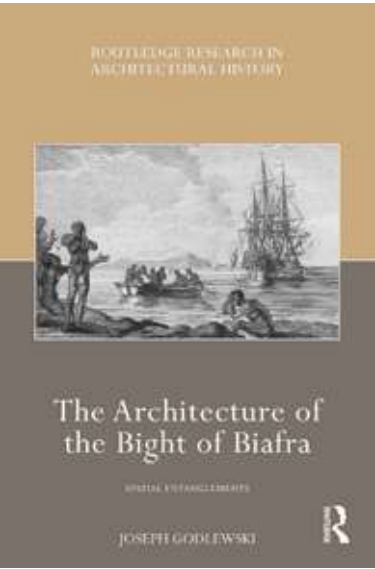
Alejandro García Hermida y David Rivera

Medio siglo sin paradigma.

Conversaciones sobre cultura

arquitectónica contemporánea

Ediciones Asimétricas, 2025



Echoes of the Past: Segregation and Space in the Bight of Biafra

Ecos del pasado: Segregación y espacio en el Golfo de Biafra

Ecos do passado: Segregação e espaço no Golfo de Biafra

Zicheng (Roy) Zhang

In *The Architecture of the Bight of Biafra: Spatial Entanglements*, architect and historian Joseph Godlewski examines five key spatial paradigms—traditional walled compounds, masquerade, the offshore, enclaves, and contemporary zones—to illustrate the complex interplay of local and global forces in the Biafran region of southeast Nigeria. Cultural practices, economic activities, political control, and social hierarchies have all played a role in shaping these spaces, determining their boundaries and functions. Particularly compelling is Godlewski’s investigation of how segregation occurred within each spatial paradigm. Segregation and spatial division have been consistent forces shaping urban development, from walled compounds to the present-day

Tinapa Free Zone. Walled compounds were segregated by lineage and social hierarchy, while colonial enclaves were enforced through racial ideologies and religious conversion. The Tinapa Free Zone, envisioned as a Nigerian Dubai, replicates historical inequalities clothed in neoliberal ambitions, benefiting a select few while marginalizing society at large.

A similar tendency of persistence in internalized control structures is observable in the China of post-Mao economic reform, as expressed by anthropologist Helen Siu’s concept of “state involution,” referring to a phenomenon by which generations having internalized the institutional and ideological power of the state ironically reproduce this intrusive influence in their own behavior (*Tracing China: A Forty-Year Ethnographic Journey*. Aberdeen, 2016).

The theorist Keller Easterling argues that setting up zones distinct from the local economy will most likely be a losing proposition (*Zone: The Spatial Softwares of Extrastatecraft*, 2012). The closure of Tinapa in 2021 highlights the precariousness of such isolated enclaves, intended to be integrated into a global framework on their own terms while navigating complex political landscapes such as that of contemporary Calabar. Godlewski’s deeply anthropological approach prompts us to reexamine the meaning of traditional spaces, viewing cities as evolving landscapes where past and present are in constant entanglement and negotiation. His analysis offers valuable insights into spatial transformations not only in the Bight of Biafra but in complex urban contexts worldwide.

Joseph Godlewski

The Architecture of the Bight of Biafra:

Spatial Entanglements

Routledge, 2024



Constructing Continuity: From Craft to Traditional Urbanism

Construir la continuidad: Del oficio al urbanismo tradicional

Construindo a continuidade: Do ofício ao urbanismo tradicional

Wesam Al Asali

True to its title, the 2025 *New Traditional Architecture* reflects an endeavor to anchor contemporary architectural discourse in the soil of traditional building culture. This richly illustrated annual volume documents the outcomes of the Richard H. Driehaus Architecture Competition and Building Arts Awards along with the Donald Gray Training Grants for 2024–2025. Produced by Fundación Culturas Constructivas Tradicionales, it is both a celebration and a chronicle of efforts to revitalize traditional building practices across Spain and Portugal.

Structured around three pillars—building craft awards, architectural design proposals, and training programs—the volume combines case studies, technical considerations, and

profiles of master artisans. It opens with reflections on a growing technological alienation in architecture, reasserting the value of manual expertise and construction on a human scale. The leitmotif is that traditional architecture is not a vague nostalgic regression but forward-looking, site-specific, and eco-friendly.

Highlights are in-depth profiles of four award-winning master artisans: Feliu Martín Farré (stonemason), Miguel Ángel Tapia (wood carver), Manuel Monteserín (rye-straw thatcher), and Juan José Gómez Delgado (blacksmith), with backgrounds and photos along with details of tools, techniques, and materials. In the section on the 2022–2025 Driehaus Architecture Competition, proposals for the Spanish villages of Baltanás, Irurita, and La Fresneda show persuasive responses from traditional urbanism to contemporary needs. The winning projects demonstrate that vernacular knowledge can be harnessed to counter depopulation, landscape fragmentation, and erosion of regional identities.

The publication also covers the Foundation’s workshops, exhibitions (notably *Materia. Oficio. Lugar.*), and summer schools, reflecting its educational mission. The bilingual Spanish-English format makes the text accessible and the figures—watercolors, maps, plans, and photos of craft construction—are interesting and engaging.

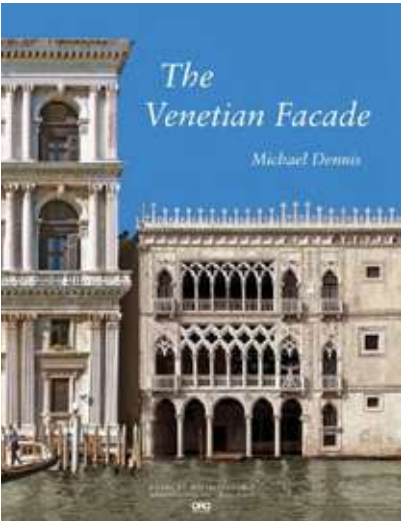
This 2025 edition of *New Traditional Architecture* offers another living archive of craft knowledge and of the Foundation’s vision for humane architecture. Highlighting hands-on practice and regional architectures, the volume makes a compelling case for traditional construction as a vital, adaptive cultural force.

Alejandro García Hermida, Guillermo Gil Fernández y Rebeca Gómez-Gordo Villa

Nueva Arquitectura Tradicional MMXXV

Fundación Culturas Constructivas

Tradicionales, 2025



How to Make a Great Facade, Venetian Style

Cómo hacer una gran fachada, a la veneciana

Como fazer uma grande fachada, ao estilo veneziano

Matthew Bell

How, today, with so much focus on green building, is one to learn lessons from architectural history? Have the imperatives of sustainable design trumped all other issues when a proposition is evaluated in today’s marketplace of ideas? For while sustainability is indeed an imperative, buildings still need to be artfully composed to make environments that are good to live in—an aspect of sustainable design often overlooked. In an urban context, this begins with the facade.

In his recently published book, *The Venetian Facade*, Michael Dennis gives us a sense of what artful composition could be, at least from the perspective of centuries of facade design in Venice. Venice, like perhaps no other city, has a consistency of building types linked to construction methods and

customs resulting in a diverse wealth of sophisticated frontage. Dennis frames his analysis with facade typology, such as side-and-center-bay facades, double facades, etc., without confining himself to historical eras, thereby transcending matters of patronage and style.

Dennis does not simply survey themes and similarities but rather provides a “deconstruction” of selected facades to reveal their layers, compositional order, figural elements, etc. His approach involves literally taking facades apart (with deft use of Photoshop), analyzing them with diagrams or recompositions to illustrate particular insights or transformations, drawing lessons from history. To understand these architectural achievements and to integrate this understanding into a design toolkit, such exercises are essential. Anyone who aspires to design good facades and townscapes should peruse this book for what it has to say, the examples it gives, and its approach mindful of present-day design.

Michael Dennis
The Venetian Façade
ORO Editions and the University of Notre Dame School of Architecture, 2024



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