SIZATLAS

ALCINO CARDOSO HOUSE

1 Boa Nova Tea House and Restaurant
2 Ocean Swimming Pool
3 Alves Costa House
4 Alcino Cardoso House
5 Bouça Housing Complex
6 Faculty of Architecture of the University of Porto
7 Santa Maria Church and Parish Centre
8 Portugal Pavilion, Expo'98
9 Serralves Museum of Contemporary Art
10 Beires House
11 Malagueira Neighbourhood
12 Borges & Irmão Bank
13 Avelino Duarte House
14 Setúbal School of Education
15 Reconstruction of the Chiado area
16 Viana do Castelo Public Library
17 Pinto & Sotto Mayor Bank
18 Adega Mayor

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INTRODUCTION

CONTEXT

Twentieth-century heritage is particularly vulnerable because of its formal and material solutions, but also due to the fact of having scarce recognition among the civil society and heritage safeguarding bodies. Considering this background, the ICOMOS study "The World Heritage list: filling the gaps – an action plan for the future" (ICOMOS, 2005) and the Global Strategy of the UNESCO World Heritage Committee (WHC) have encouraged State Parties to submit twentieth-century heritage nominations (UNESCO-WHC, 1994).

In this context, the ICOMOS-Portugal presented the "Ensemble of Álvaro Siza's Architecture Works in Portugal" to the World Heritage (WH) Tentative List, in 2017 [3], later submitted to the WH List by the Faculty of Architecture of the University of Porto, in 2024, under the title "Álvaro Siza's Architecture: Modern Contextualism Legacy". This nomination proposal expresses Álvaro Siza's outstanding architecture spanning across the second half of the twentieth century, which testifies to the critical revision of the Modern Movement principles towards a more contextual and humanist approach. This modern contextualism is an exceptional legacy conveyed by Álvaro Siza's architectural works and his 'School', with major impact across different generations of architects, in distinct continents, addressing the needs and the aspirations of local populations. The component parts emerge as a result of the architecture development in the second half of the twentieth century, responding to the specific conditions of local contexts and producing alternative responses to the prevailing axioms of the international Modernism, while also contributing to the Postmodern debate. Siza is a worldwide recognized architect with approximately five hundred projects and built works spread across four continents and sixteen countries, and the subject of more than one hundred distinctions and awards, nineteen Honorary degrees, and hundreds of dedicated publications.

Despite international recognition of the quality of Siza's architecture, there is not yet a complete and systematic inventory and consistent documentation of his built works. The information is usually scattered, partial or incomplete. The existent literature focuses more on formal aspects of the designs, and little on the tectonics and material dimension of his works, including the building's state of conservation and the potential threats affecting them.

With this framework, the project 'SizaATLAS: Filling the gaps for World Heritage' (SizaATLAS) was submitted and funded by the Foundation for Science and Technology (FCT) between 2021 and 2024. This research project aims to address: i) a collaborative platform for interactive dissemination; ii) a comprehensive inventory of all of Siza's built works; iii) a detailed documentation of the 18 buildings selected for the WH Tentative List (which is the main focus of the present booklet); iv) Recommendations for the WH nomination; and v) Dissemination and knowledge transfer.

METHODOLOGY

The research methodology for the documentation booklets is supported by a cross-analysis of different methods and tools: i) archival and bibliographic research; ii) field work observation and surveys; iii) digital documentation such as photogrammetry, virtual tours through 360° photos, 3D BIM didactic model of representative constructive sections and details. This multi-method approach, combining traditional and digital techniques, aims at providing holistic, integrated and comprehensive documentation, providing accessible information for diverse audiences, ranging from specialists to the general public, and a robust framework for management and conservation informed by the attributes of Outstanding Universal Value (OUV) and Álvaro Siza's design principles.

i) Archival Research included the consultation of documentation held by the Serralves Foundation, the Calouste Gulbenkian Foundation, the Canadian Centre for Architecture, or Drawing Matter. In addition, municipal archives and libraries were also consulted to gather as much relevant information as possible. Research included textual and graphic documentation, such as licensing projects, written documents, technical drawings, sketches, photographs, models, and correspondence, Also, comprehensive literature was developed for each building documentation.

ii) Fieldwork encompassed a meticulous exploration of the building's spaces and discussions with staff members, which provided valuable context and enhanced comprehension of the buildings. To ensure a comprehensive documentation process, an extensive photographic survey was conducted, employing drones to capture both aerial perspectives and detailed captions of the sites. Furthermore, this process included an in-depth analysis of construction details, with a particular focus on tectonic features.

iii) The digital documentation protocol was thoughtfully devised to facilitate the systematic organization and seamless integration of all gathered data, culminating in the creation of a comprehensive and easily accessible archive for future reference. The methodology for digital documentation, framed within the SizaATLAS research project, employs combined techniques to document Álvaro Siza buildings, namely: a) photogrammetry, b) 360º virtual tours, and c) BIM didactic models.

BOOKLET STRUCTURE

The booklets are structured in 9 sections.

The INTRODUCTION provides the background, aims and methodology of the SizaATLAS documentation booklets.

The HISTORY AND DESCRIPTION section provides a general context of the building analysed in the booklet, including the following aspects: place and date of construction; landscape, natural features and preexistences; context of the building commission; design and construction phases; detailed description of the design process supported on archival resources; composition, volumetrics and geometry; programme and functional organization; promenade and light; tectonics and constructive detailing; Integrated artworks and furniture; awards and recognitions; recent interventions; international impact of the work.

As regards the section CONSTRUCTION, it aims at providing a tectonic perspective of the buildings through a representative section and details focusing on its Structural System, Walls, Roofs, and Frames.

The DESIGN PRINCIPLES aim to clarify Álvaro Siza's original design intent, being a permanent reference for the conservation of the building and an instrument to manage proposals for change. It should also be considered when establishing planning controls for the surrounding landscape, ensuring the preservation of visual relationships and future long-term improvements to the setting. To remain faithful and respectful of Siza's thoughts and design approach, these design principles are based on his own words, namely on a selection of 'aphorisms' collected from his texts, design reports, and interviews.

The ATTRIBUTES section relates to the specific and unique qualities expressed in the OUV for the WH nomination proposal "Álvaro Siza's Architecture: Modern Contextualism Legacy", namely: i) Architecture responsive to a physical, social and historical context; ii) Integration of international and local references; iii) Sculptural volumetric expression; iv) Oriented spatial experiences; v) Total work of art including details, furniture and art works.

STATE OF CONSERVATION is a description of the building's current condition and recent conservation or reuse interventions. In most cases, the buildings have been submitted to recent conservation interventions which adapted them to current legal, sanitary, accessibility or comfort standards.

DIGITAL DOCUMENTATION results from an integrated methodology combining: i) photogrammetry; ii) 360º virtual tours (available through QR Codes); and iii) BIM didactic models. These techniques are adapted to each building with some limitations related with the photogrammetry conditions (vegetation, surface colours, and others) or to the access to the buildings, which was authorized in public buildings, and restricted in private houses and bank agencies.

SOURCES AND BIBLIOGRAPHY refer to the archives and specific literature consulted for each building under analysis.

HISTORY AND DESCRIPTION

The Alcino Cardoso House (1971-73) is situated in Lugar da Gateira, within the parish of Moledo do Minho. Commissioned to Álvaro Siza in 1970, it involved adapting several rural houses into a holiday home. Construction occurred between 1971 and 1973, with Siza returning multiple times for further work.

The house is positioned halfway up a hillside, offering ocean views, in a landscape of narrow paths, vineyards, and small agricultural fields (minifúndios). This densely wooded area is accessed via narrow roads that ascend from the nearby coastal road. The property is surrounded by high walls along a steep road. Siza's approach balances his vision with the existing fabric of the area, integrating a modern house with preexisting agricultural structures, thus preserving the rural atmosphere.

Alcino Cardoso, who worked at the Pinto & Sotto Mayor bank office in Oliveira de Azeméis (also designed by Siza, 1971–1974), and his wife Zilda Cardoso commissioned the renovation and extension to create a holiday house for their family.

A key design consideration was to minimise the inclusion of foreign elements. Mid-twentieth-century Portugal saw the emergence of a tendency to merge modern principles with the vernacular legacy. During this period, the intervention criteria promoted by the DGEMN (Directorate-General of National Buildings and Monuments) were moving on from the stylistic restoration advocated by the Salazar dictatorship to the operational practices of archaeological restoration and the theoretical principles of scientific restoration. This shift reflects the influence of the Venice Charter (1964), which began to acknowledge the cultural value of historical and rural architectural ensembles.

Collaborators on the project included António Madureira, Francisco Guedes de Carvalho, Adalberto Dias, and Nuno Ribeiro Lopes.

The Cardoso family purchased this 1780 m2 countryside estate attracted by the charm of two plum trees they had found while exploring this semi-abandoned and overgrown property. Attached to its perimeter walls, two small buildings circumscribe a patio facing the main entrance. On one side stands an 80 m2 rectangular construction, while on the other side is a slightly more irregular structure spanning 90 m2 over two floors. A few years later, they acquired the adjoining estate to the west, now known as Casa da Eira. It comprised three buildings arranged around a courtyard near the entrance gate, along with two granaries (espigueiros). Both ensembles are demonstrations of the typical rural complexes which characterize the landscape of northwest Portugal, adhering to a constructive and typological model developed during the seventeenth and eighteenth centuries. These smallholdings focused on maize and vine cultivation, alongside other horticultural and fruit crops, and livestock raising, enabling diversified production on a small scale. Even though the initial commission was to adapt the existing buildings into a modern holiday home, the owners transformed it into a

guest house afterwards. However, in 1986 Siza was again summoned to convert three other rural houses on the neighbouring plot, purchased by Alcino Cardoso, into additional lodging for the guest house. Although Siza drafted designs for a new event space on the property between 1996 and 1997, it was not realized. Siza completely altered the interior layout of the old house, transforming the space into a large living room and kitchen, separated by a light partition. However, the stone walls were maintained, and the roofs were renovated, thus preserving volumetrics and character.

A new triangular volume, meticulously aligned with the property wall on one side and the vineyard's slope on the other, was incorporated into the existing structure – a vineyard farm, like others in the vicinity – to meet the evolving needs of a vacation retreat. This new wing, constructed during the initial phase to accommodate five bedrooms and bathrooms, takes form of a sharp half-sunken triangular polygon, delicately merging with the aged rubble-stone building. Adjacent to it, the subsequent construction, housing the living room and kitchen, creates an intimate patio alongside a two-floor building, also refurbished as an additional lodging. Opposite the entrance patio, the other ruined building was transformed into an autonomous two-storey dwelling. Some years later, Álvaro Siza conceived a swimming pool for the garden, utilizing a preexisting irrigation tank. On one side of this pool, the architect created "an invented ruin", evoking memories of Minho's landscape, seamlessly blending with its surroundings — the new and the old, symbolizing an intermediary or perhaps an (im)possible synthesis. Additionally, various other elements discovered on-site, of unknown origin, such as walls, benches and ashlars were rearranged to create an "undated archaeological field".

The new volume is articulated with the largest of the existing houses using the analogy of the hinge, a resource already used in Siza's previous designs. The curtain wall and zinc roof of the new extension contrast with the use of raw local stone in the retaining wall, allowing the whole to blend with its environment.

Furthermore, parallels can be drawn between Frank Lloyd Wright's work and the Alcino Cardoso House. These similarities include the tension between the stone masonry foundation and the lightweight frames that enclose the building, as well as the 45º angle. On the other hand, at the corners, masonry is halted, and proper support is ensured by wooden columns.

The curtain wall of the new volume, characterized by its delicate mullions, reveals an earnest affinity with the vernacular architecture of Minho's traditional windows. Its critical readdressing of a modern axiom, the curtain wall, with such rudimentary technology has had an enlightening reception in younger generations.

Hence, in a typical farm estate (quinta) there are structures for drying cereals (the sequeiro and the espigueiro), stables or outbuildings for the wine press and for storing tools. In the main house, while the ground floor was used to keep the animals or as cellars, the upper floor was the farmers' residence. The dwelling usually consisted of a kitchen, one or more rooms and alcoves, and a porch (varanda). A sort of interior curtain wall, with movable panels, outlines the kitchen space and antecipates the glazed front of the new volume. The rest of the use programme (five bedrooms and bathrooms) was incorporated into a triangular-shaped annex, connected to the old construction by means of sharp geometry. Following the premise of "reducing the new to the minimum", this new volume is semi-buried and has a flat roof so as not to disturb the scale and predominance of the preexistingbuilding. This annex is laid out in parallel to the walls of the property and placed on a sort of plinth, as a terrace in the landscape. Although the owners initially intended to replace the existing vineyard with an orange grove, the architect decided to keep it to preserve the *genius loci* of the place, taking advantage of the vine arbour as a shading mechanism and as a reference pattern to modulate the rhythm and height of the new structure.

The dense vegetation defines both the landscape and pathways on the property, highlighting the contrast between nature and built structures, including the new wing's light design. Inside the house, out of the corridor's umbra and into the bedrooms, visitors are met by the southern light, filtered by bright orange blinds, creating a warm atmosphere complemented by wood and reddish-toned textiles. A notable contemporary feature is the division of spaces using sliding wooden panels or curtains, evoking a sense of continuity and possible Japanese influence. For example, the living room and kitchen are separated by a light wooden panel resembling a folding screen, enhancing spatial fluidity, luminosity, transparency, and sensory tectonics.

The construction methods were simple and involved few materials. Due to the remote location and lack of skilled labour, Siza opted for locally available materials such as stone and wood, employing traditional techniques known to the local workforce. Existing buildings were carefully restored: stone walls were repaired, and the roof tiles were preserved or replaced with similar ones.

The design of the new annex provides a balance between contrast and continuity. While features like the flat zinc roof and glass curtain wall distinctly mark the new from the old, the design also pays homage to tradition.

In what can be regarded as one of the most influential details in Portuguese contemporary architecture, the curtain wall's window frame is detached from the roof structure. This expedient detail simultaneously dissimulates the thickness of the roof beam, while providing the place to conceal the drainage channel and hang of the blinds. The material quality of the building, albeit a fundamental constituent, is conceived as contingent and transient; the zinc roofing and the light masonry partition walls are all elements of a light tectonic with foreseeable degradation. Using these materials against the time-honoured rubble-stone walls, the architect proclaims an existential condition for the architecture of our time. Unlike the rough

and heavy masonry walls of the old building, this volume has a light structure and a large curtain wall facing the vineyard so that the glass façade dematerialises as it reflects the vegetation.

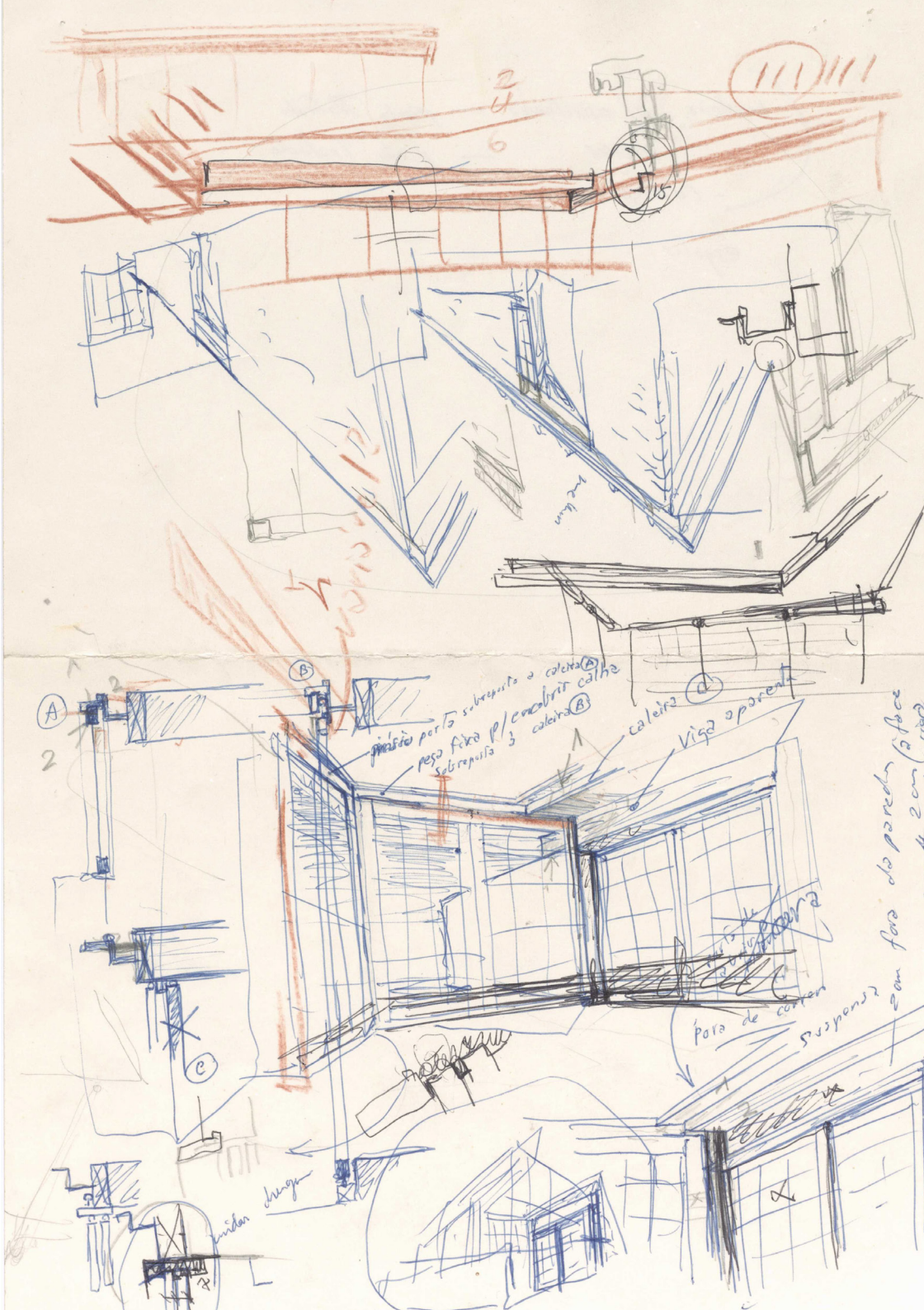
In terms of integrated furniture, the Alcino Cardoso House features a unique interior curtain wall, with movable panels, delineating the kitchen space. Its winding form determined Siza's kitchen counters and cupboards' design.

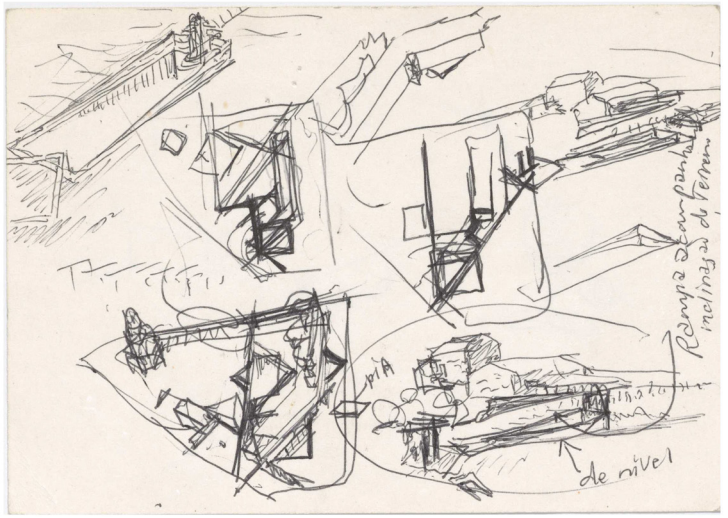
The Alcino Cardoso House was one of the first interventions in preexisting buildings undertaken by Álvaro Siza to receive national and international acclaim. This early Álvaro Siza intervention in a rural context has become a reference case-study for the School of Porto architects and provides us with lessons on contemporary reuse of built heritage.

In some way, Álvaro Siza's intervention in the Alcino Cardoso House constitutes a reference case of intervention in rural preexistences from which multiple lessons and interpretations can be extracted. It echoes the ambitions pursued by the "third way" (bridging modernism and tradition), which emerged in the heat of the "Survey on Regional Architecture in Portugal", as well as reflecting the search for continuity in the intervention in preexisting buildings.

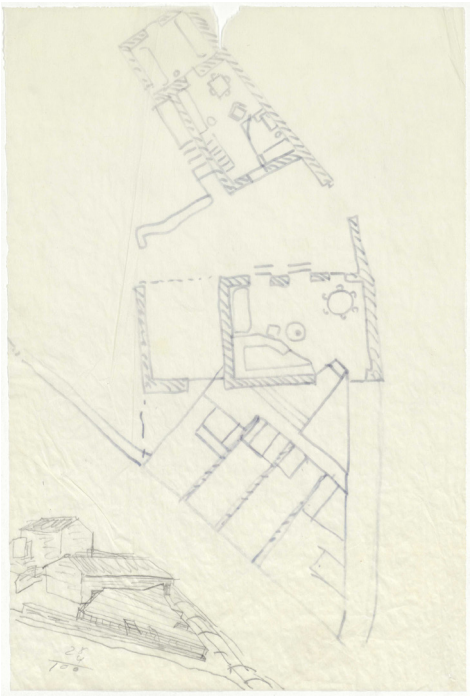
The Alcino Cardoso House is well preserved, with all its components and systems in excellent condition. Thus, the maintenance actions have been essential to maintain the building's good state of conservation. Additionally, the project is extensively documented by the owners in various web and printed publications, which detail the emotional relationship they maintain with the house, as well as Álvaro Siza's capacity to effectively address the client's needs.

The Alcino Cardoso House was included in the famous publication Álvaro Siza: Poetic Profession in 1986, that counted on critical contributions by Kenneth Frampton, Nuno Portas, Alexandre Alves Costa, Pierluigi Nicolin, Oriol Bohigas, and Bernard Huet. However, there is a lack of in-depth monographic studies on the subject, and the available published material is relatively limited. This is surprising given the significance of this work in pioneering the concept of the "third way" in architectural renovation of preexisting buildings. This approach emphasizes modern living standards and design principles while simultaneously preserving the character and identity of the original structure within its surrounding landscape, rejecting the dichotomy of either complete rupture or stark contrast.

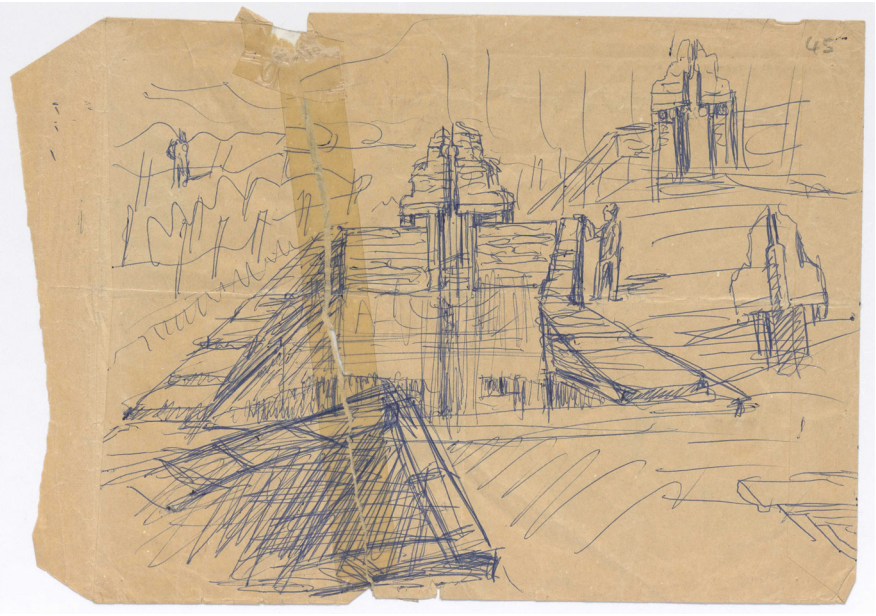




03. Composition and volumetric studies.

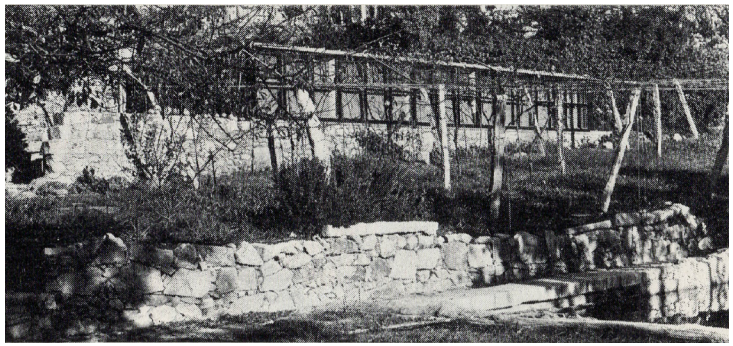


04. Relationship between the addition and preexisting constructions.



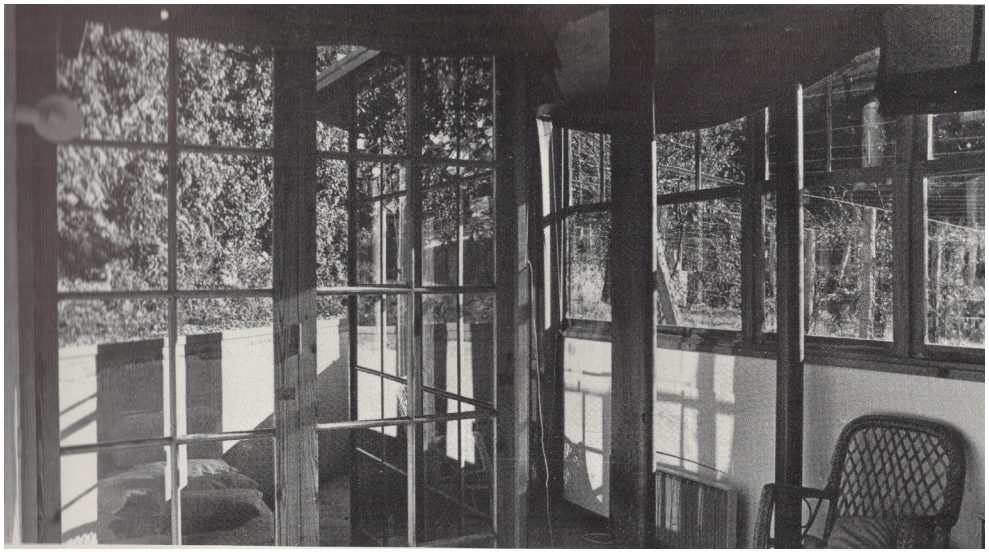
05. Swimming pool preliminary design.

06. South façade and garden, 1979.

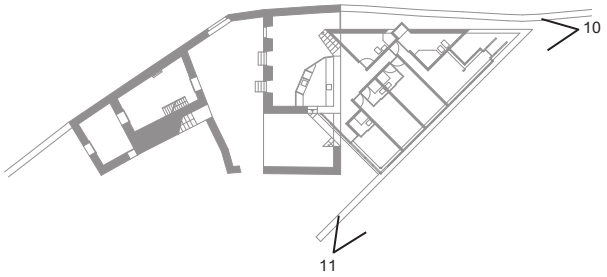


07. South façade, 1979.

08. Southeast façade and main bedroom's sunken patio, 1979.



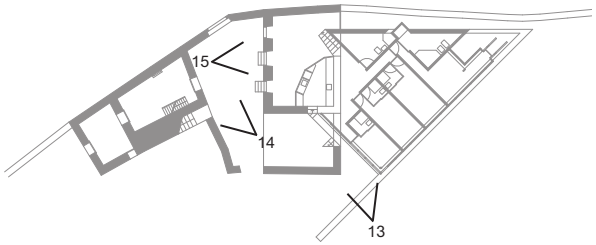
09. Main bedroom, 1979.



10. Southeast façade and main bedroom's sunken patio, 2023.

11. South façade, 2023

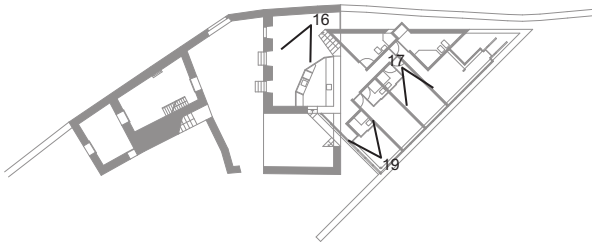
12. Swimming pool, 2023.



14. Entrance courtyard, 2023.

13. Contact between the curtain wall and the granite walls, 2023.

15. Northwest façade, 2023.

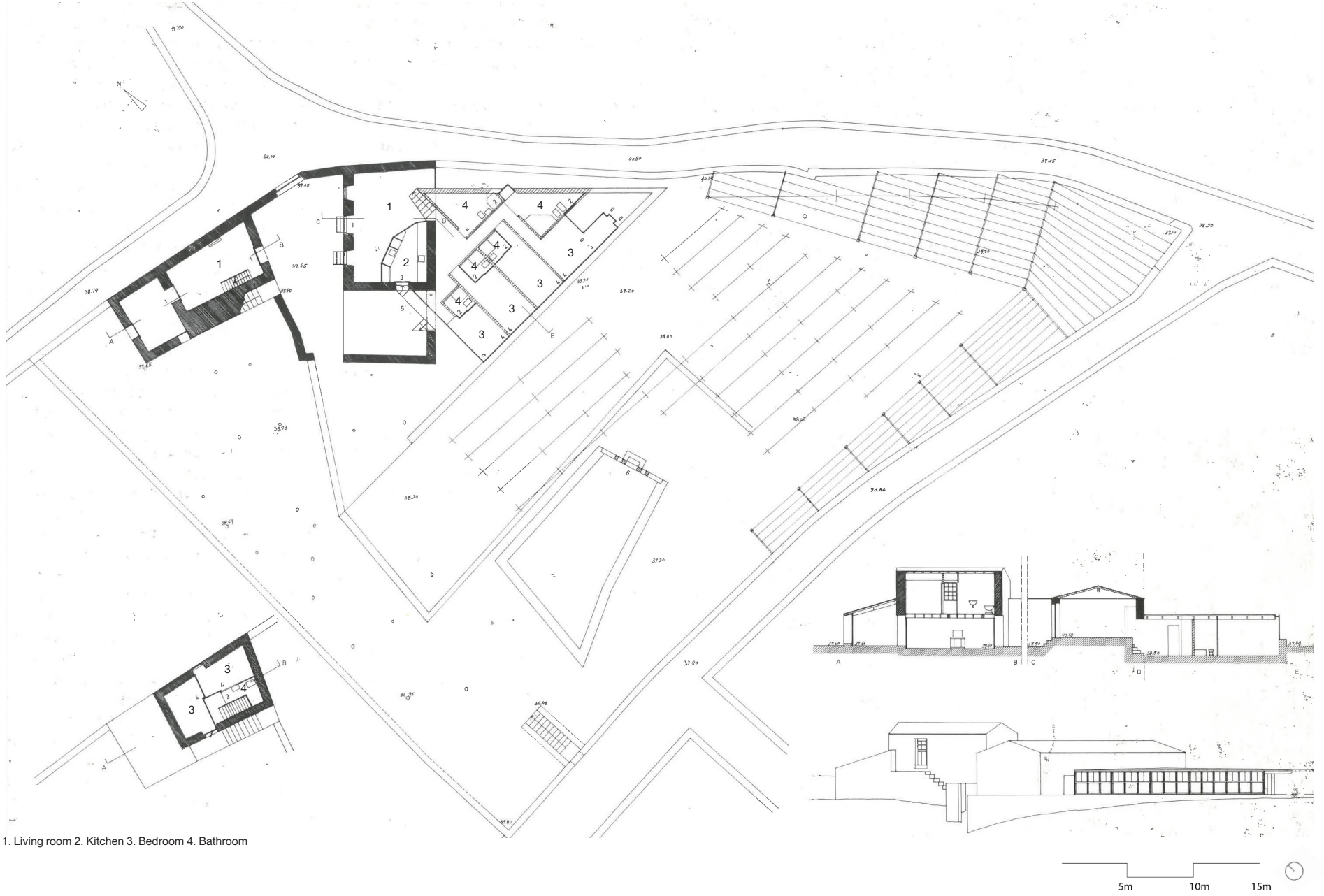


16. Living room and kitchen, 2023.

17. Ensuite bathroom sliding partitions (closed), 2023.

18. Ensuite bathroom sliding partitions (open), 2023.

19. Bedroom, 2023.



1. Living room 2. Kitchen 3. Bedroom 4. Bathroom

20. Plan, elevation and section

CONSTRUCTION

STRUCTURAL SYSTEM

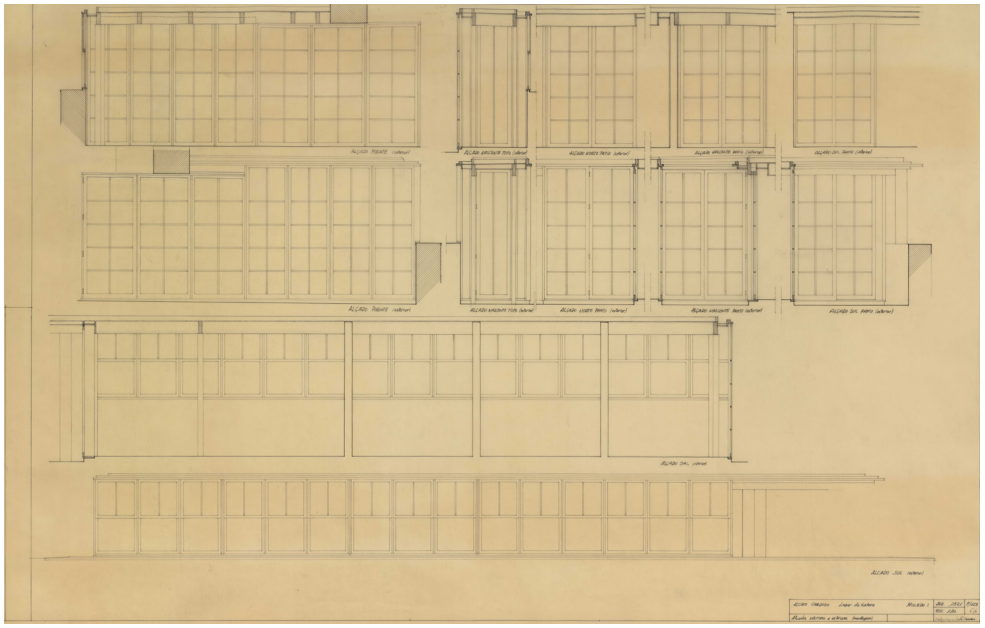
The vertical structure of the Alcino Cardoso House preserves the original structural walls, which are made of old, rough stone. In the extension, the vertical structure consists of load-bearing masonry walls and occasional wooden pillars. The masonry walls include the perimeter wall along the access route and the partition walls between rooms. The wooden pillars are positioned within the rooms at the ends of the volume.

The house's horizontal structure also maintains the traditional construction techniques of the existing building. The new addition features a light wooden structure, with the horizontal framework consisting of timber joists supported by the previously mentioned vertical elements.

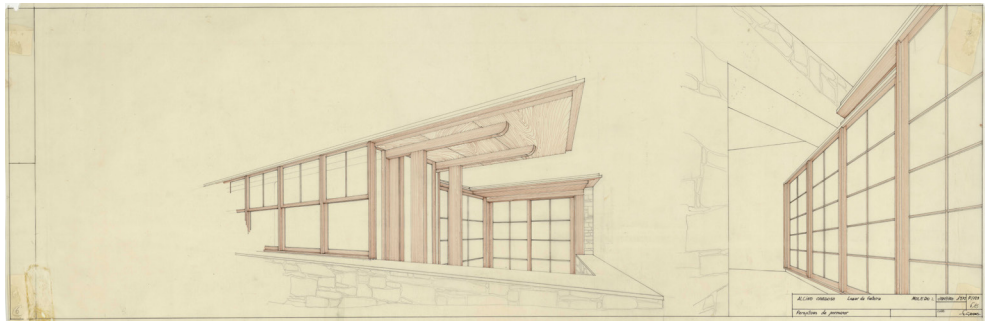
WALLS

Following on from the vertical structure, the stone masonry walls in the rooms of the existing buildings are plastered and painted white on the inside. A wooden structure, referred to as a "windbreak" in the preliminary drawings by Siza, functions as an interior curtain with movable panels, defining the kitchen space.

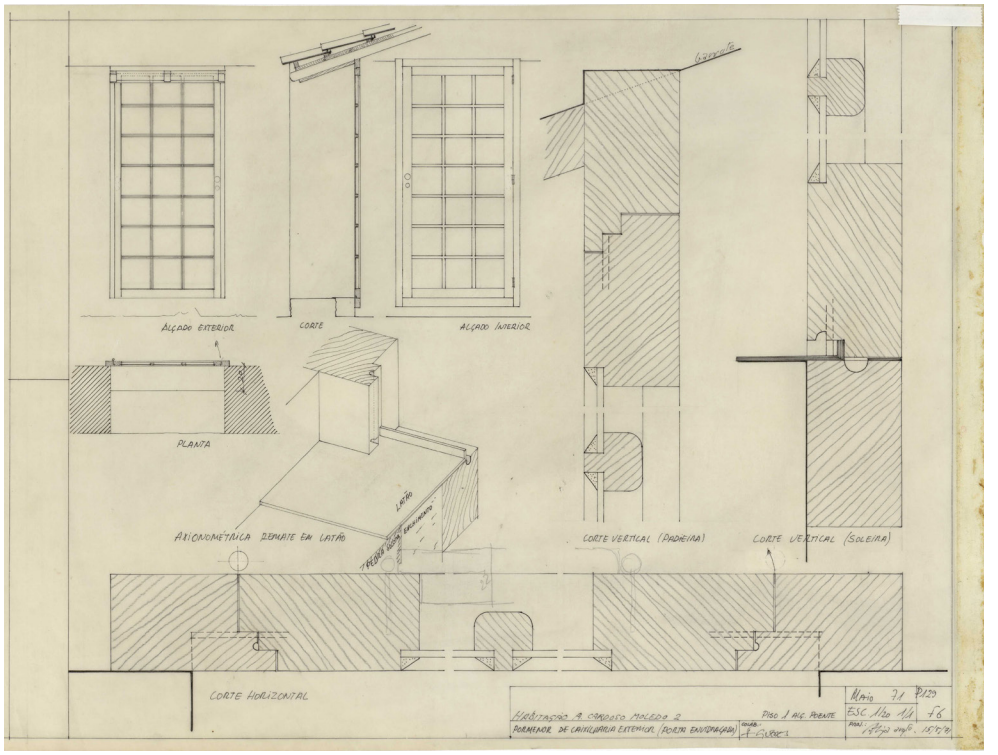
The two main exterior walls defining the volume of the extension are constructed from perpend stone. The southern wall, a parapet, forms a courtyard as it transitions to the east, and then becomes a wall parallel to the boundary wall on the east, thereby accentuating one of the access routes to the interior. Both the parapet wall and the adjoining wall are plastered and painted on the inside, as are the partition walls of the rooms, except in the bathroom areas where the walls are covered with white 15 x 15cm tiles.



21. Interior and exterior elevations, 1971.



22. Detailed perspectives, 1972.



23. Frame detailing, 1971.

FLOORS

In the Alcino Cardoso house, the floors are made of cork boards, including the treads on the staircase that connect the new and old structures, and mosaic tiles in the bathrooms. The mosaic is set on a waterproof leveling layer with a thickness of 2 to 3cm.

The connection between the two structures is achieved with a wooden staircase that overcomes a one-metre gap with seven steps.

ROOFS

The roofs of the existing buildings, with their wooden structures and clay tiles, were maintained or restored. The use of local labour means there are no detailed drawings of these elements. In the laundry room, this is demonstrated by the use of traditional construction techniques that pragmatically forgo elements such as the line, the diagonal, or the king post in the execution of the roof structure.

In the new structure, the roof is supported by a wooden beam resting on masonry walls; at the corners, the masonry is replaced by wooden pillars, as seen on the south-west elevation of the house. The flat roof is covered with zinc sheets. The suspended ceilings are made of beech veneer plywood. The thermal insulation is made from cork.

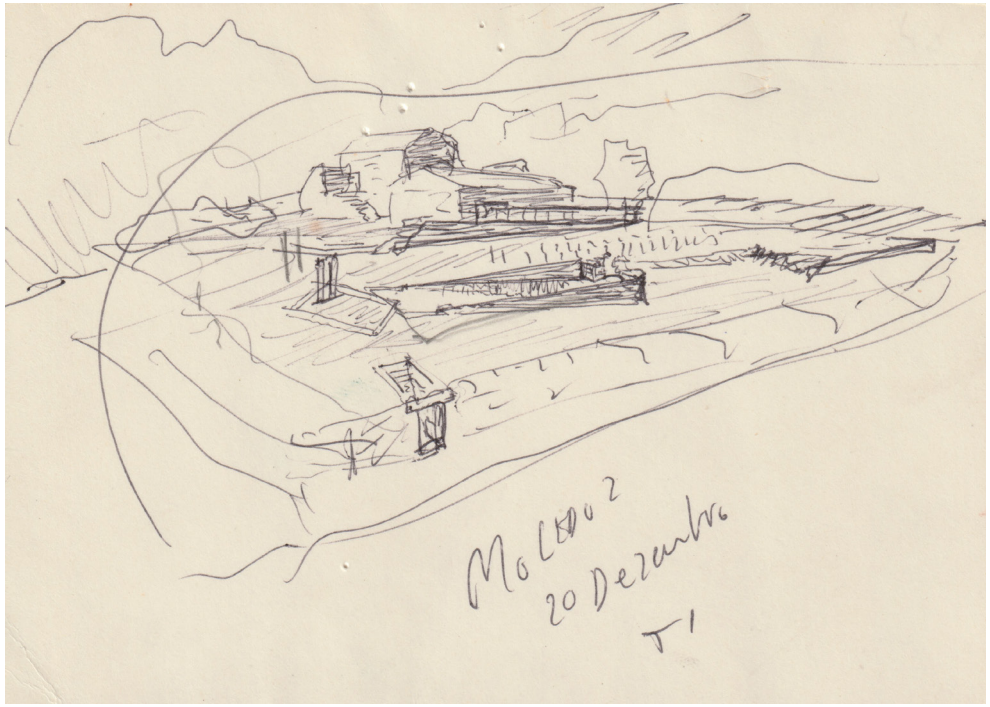
OPENINGS

In the old part of the building, the exterior window frames (including the sill, jambs, and head) are made up of glazed doors and windows that open outwards and are finished with brass fittings. All the frames are made of Baltic pine, lacquered and painted gloss black.

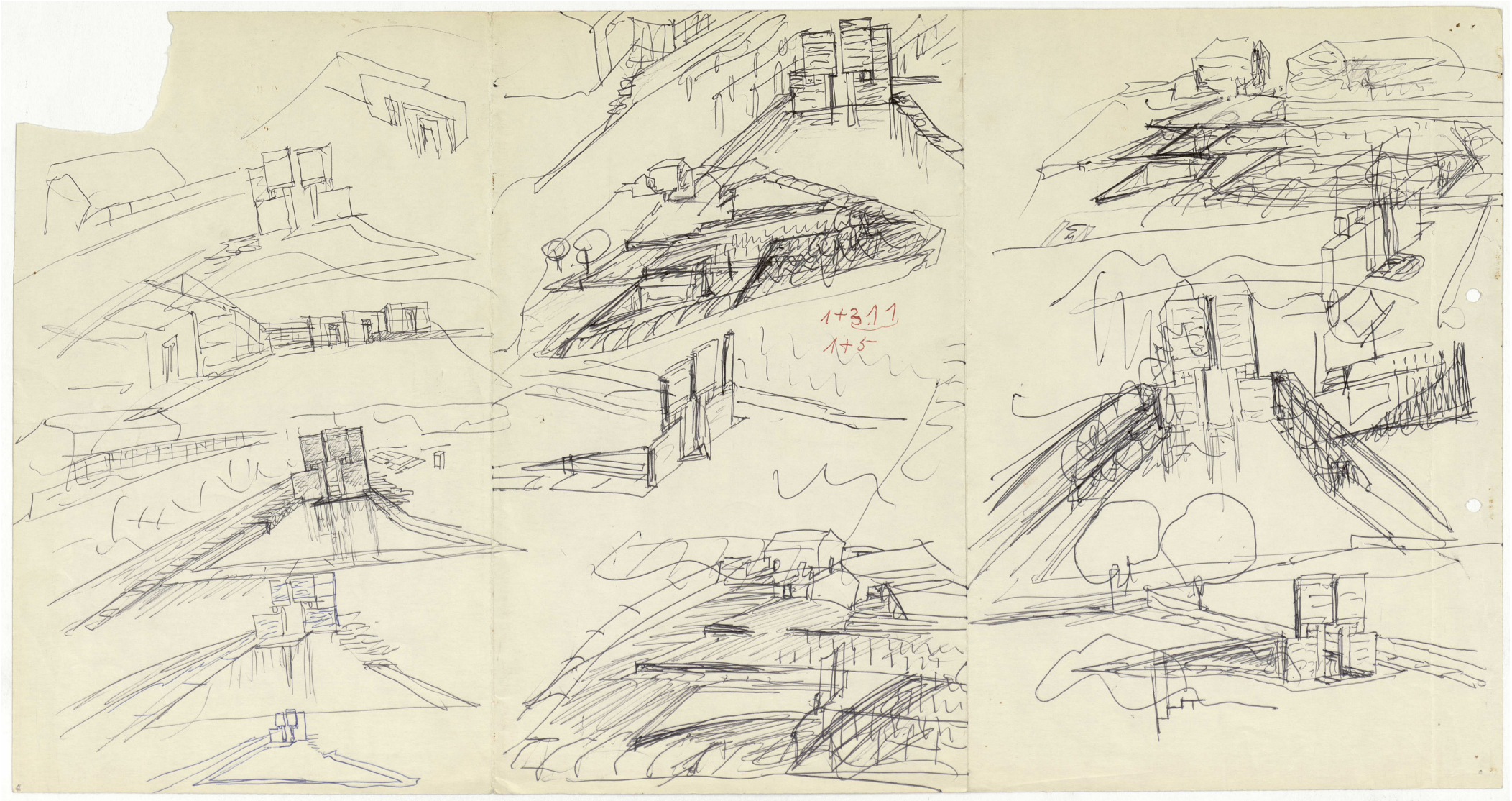
The new body is separated from the existing one with a folding door, made with wooden frames and structure and plywood fronts, featuring six joint hinges and two handles.

The new body's glass curtain wall is separated from the roof structure, which simultaneously conceals the thickness of the roof beam, the drainage channel and the blinds.

The interior window frames are made of enamelled wood.



24. General perspective.



25. Studies for the swimming pool.

DESIGN PRINCIPLES

REGAIN THE CHARACTER OF THE BUILDINGS AND THE LANDSCAPE

I tried to regain the character of the buildings and the landscape. The existing factors and the new ones are clearly contrasted and violently interpenetrated (Siza, 1979)

PRESERVING THE MORPHOLOGIC CHARACTERISTICS OF THE HOUSES

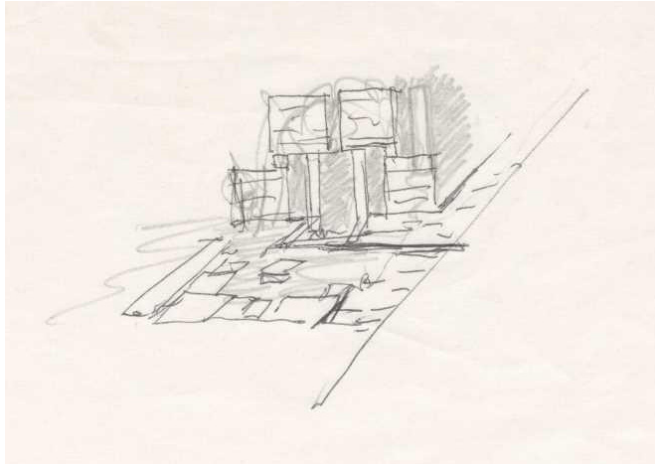
The design consists of preserving the morphologic characteristics of the houses (...) and providing them with acceptable living conditions. (...) The existing roof structure and tiles will be recovered. Exterior walls will maintain the exposed stone masonry. (Siza, 1988b)

AN INVENTED RUIN, BOTH NEW AND OLD

The swimming pool designed at a later date, was meant to be an invented ruin, deriving from the memory of many things pertaining both to the Minho landscape and to other landscapes. It is oriented to the sun's path and is intended to be related to everything surrounding it, both "new and old", as if it were an intermediary or an impossible synthesis. (Siza, 1979)

THE EXISTING AND NEW ELEMENTS DELIBERATELY CONTRAST EACH OTHER

The existing and new elements deliberately contrast each other and overlap abruptly. (Siza, 1979)



26. Study for the swimming pool.

ATTRIBUTES

ARCHITECTURE RESPONSIVE TO A PHYSICAL, SOCIAL AND HISTORICAL CONTEXT

Preserving the morphological characteristics of the pre-existing buildings and providing them with acceptable living conditions was Siza's main ambition when designing the Alcino Cardoso House. Therefore, most of the stone masonry exterior walls and roof tiles are maintained or restored. Adding a modern house to some pre-existing agricultural buildings without disfiguring the rural atmosphere of the set, the architect asserts his presence while accepting the reality of the previous constructions. The new triangular volume follows the alignments and directions of the property wall on one side, and the vineyard and slope of the plot on another.

INTEGRATION OF INTERNATIONAL AND LOCAL REFERENCES

Similarities can be traced between Frank Lloyd Wright's work and the Alcino Cardoso House, such as the tension between the stone masonry foundation and the light frames that enclose the building or the 45º angle. On the other hand, at the corners, masonry is halted, and prop support is ensured by wood columns. Due to its remote location and the labour expertise available, Siza had to work with the materials available (stone and wood) and the traditional building techniques known by construction workers. The curtain wall on the newest volume, with its fragile mullions, reveals an earnest affinity with the vernacular architecture of Minho's traditional windows. Its critical readdressing of a modern axiom, the curtain wall, with such rudimentary technology has had an enlightening reception in younger generations.

SCULPTURAL VOLUMETRIC EXPRESSION

The eastern extremity of the thick rubble-stone wall of the new volume begins as a parapet, later progresses into a support for the light frame, while further west ultimately sinking, to become an indented hollow patio It may seem ambiguous that such a massive stereotomic plinth should be devised to sustain a weightless pellicular cage, but there lies the necessary and essential contradiction of the architectural concept.

ORIENTED SPATIAL EXPERIENCES

Out of the corridor's umbra and into the bedrooms, visitors are bewildered by the southern light, filtered by bright orange blinds, stained with the protective shade of the vineyard.

TOTAL WORK OF ART INCLUDING DETAILS, FURNITURE AND ARTWORKS

In what can be regarded as one of the most influential details in Portuguese contemporary architecture, the curtain wall's window frame is detached from the roof structure. This expedient detail simultaneously dissimulates the thickness of the roof beam, while providing the place to conceal the drainage channel and hang of the blinds. A kind of interior curtain wall, with movable panels, outlines the kitchen space, in a reference to the glazed front of the new volume.

AUTHENTICITY AND INTEGRITY

AUTHENTICITY

The Alcino Cardoso House maintains the authenticity of its form and design, with no major interventions since its construction.

The Alcino Cardoso House maintains most of the original materials.

Albeit being originally designed as a holiday house, the Alcino Cardoso House is currently used for tourism purposes, having been converted as a rural resort.

The rural setting of the Alcino Cardoso House, in Moledo do Minho has not faced major interventions or alterations since its construction. It does not face significant development pressures.

The Alcino Cardoso House maintains its rural atmosphere and its connection to the place.

INTEGRITY

The property limits include all the necessary elements that express the significance of the Alcino Cardoso House and the built area is of an adequate scope for presenting the attributes and the cultural significance of the whole. The building has not undergone any significative change since its construction and does not suffer from adverse effects of development or neglect.

It fulfils the conditions of integrity and has all elements necessary to express Outstanding Universal Value.

Besides that, the urban development on the seaside has not negatively affected the property. The Alcino Cardoso House currently doesn't have development threats.

STATE OF CONSERVATION

The Alcino Cardoso House is in a very good state of conservation. It has undergone systematic conservation and maintenace works, ensuring the best stability and safety conditions for its users. Remarkably, no structural repairs were necessary, attesting to the high-quality of the original construction.

Given its landscape setting, the natural degradation and weathering of the Alcino Cardoso House's fabric and material components are normal, requiring localized maintenance of its elements, including roof repairs and window restoration.

All interventions carried out by the owners respected the integrity and authenticity of the original building.

DIGITAL DOCUMENTATION

The digital revolution significantly impacts Cultural Heritage safeguarding offering advanced documentation and communication techniques. Modern heritage presents a rich opportunity for study and interpretation due to its diverse documentary, physical, and oral resources.

The methodology for digital documentation, framed within the SizaATLAS research project, employs combined techniques to document Álvaro Siza buildings, namely i) photogrammetry, ii) 360º virtual tours, and iii) BIM didactic models.

The development process involves is supported on previpus analysis of archival and bibliographc documentation and field work observation. This integrated metholodology provides holistic and in-depht analysis of the architectural works, expressing their design principles and OUV attributes, spanning form the relation with the context, the local and international references, the oriented spatial experiences, the volumetric expression and multiscalar approach, including construction and details. Also, it aims at info-accessibility and didactic dissemination of Siza's Architecture, allowing for interactive experiences to users all over the word.

PHOTOGRAMMETRY

Photogrammetry facilitates the three-dimensional representation of Siza's architectural works, interactively elucidating their relationships with the context and its volumetric dimensions. When combined with Building Information Modeling (BIM) and other digital tools, it establishes a robust documentation system.

In the last decade, photogrammetry has evolved as a crucial tool for the 3D documentation of cultural heritage, using various types of photos from both the ground and the air. Digital photogrammetry stands apart from traditional methods by employing digital images and computer systems, such as cameras, computers, and specialized software. With computer vision and automated processes, it is now possible to document very complex objects accurately and reconstruct the three-dimensional model with remarkable precision.

Utilizing drone photography from both DGI Air 2 and DGI Mavick Pro, alongside Map Pilot Pro software, comprehensive volumetric data was captured, providing insights into the buildings' integration with their context. This method not only captured the buildings' physical dimensions but also their visual impact on the surrounding landscape. Terrestrial photogrammetry further refined the models' accuracy, supported by Agisoft Metashape software for georeferencing. Employing a BIM approach ensured data interoperability and facilitated the creation of didactic models.

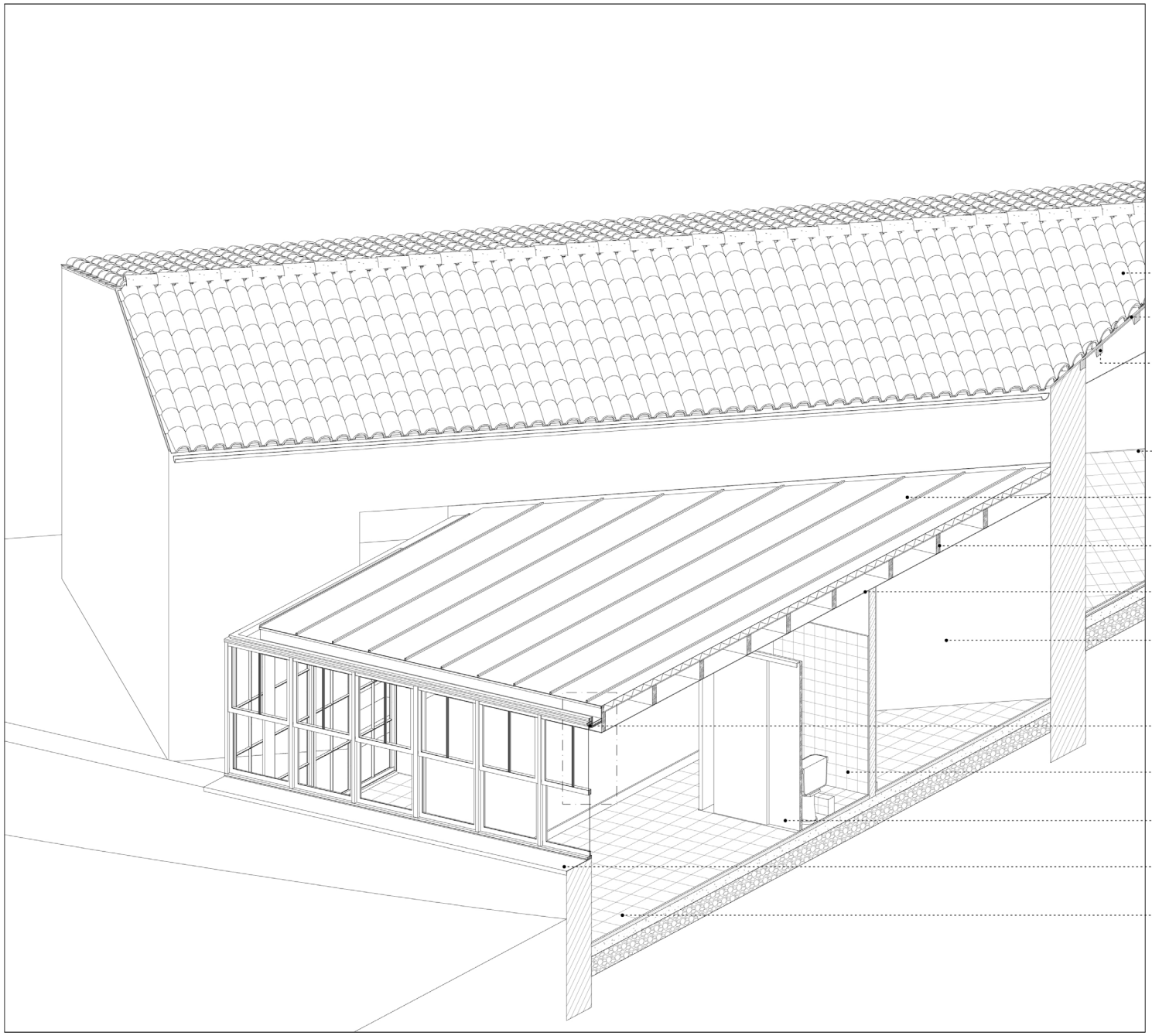
DIDACTIC MODELS

BIM didactic models have as their main objective to conduct a thorough tectonic perspective of a representative section of the building, namely on its construction and material features. Also, by comparing diverse solutions proposed for different buildings within the SizaATLAS research project, the models enable a holistic evaluation of Siza's architectural achievements, emphasizing the integration of form, function and construction.

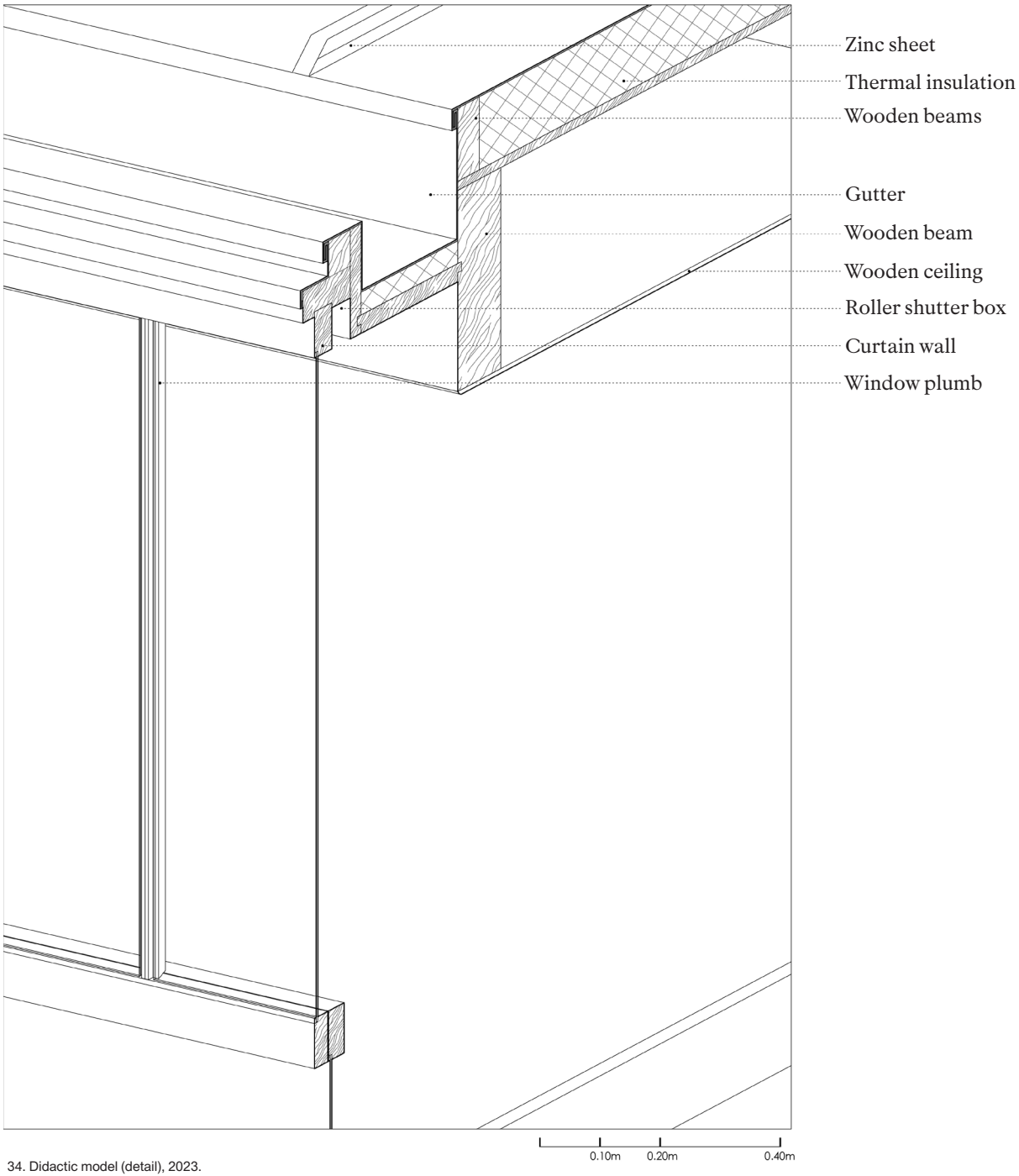
Drawing representation takes inspiration from Edward Ford's "The Details of Modern Architecture" these models prioritize clear language to disseminate knowledge effectively. The development process of the models involves cross-referencing analysis between archives and bibliography research combined with field work observation.

The Didactic Models offer an integrated approach to examining the architectural tectonics of Siza's designs. Hence, they meticulously detail material layers and construction methodologies, encompassing structural system, walls, roofs, frames and the respective intricate details.

31. 32. Photogrammetry.



33. Didactic model, 2023.



34. Didactic model (detail), 2023.

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Siza ATLAS: Filling the gaps for World Heritage

FCT Project SIZA/ETM/0023/2019

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