SIZATLAS

FACULTY OF ARCHITECTURE OF THE UNIVERSITY OF PORTO

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, 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 Faculty of Architecture of the University of Porto (1985-93) is located at Campus Pole 3 – Campo Alegre, in Porto's Lordelo do Ouro and Massarelos parish. Led by Álvaro Siza, its design and construction were overseen by the Faculty's Board. It started with the Carlos Ramos Pavilion and the conservation of Quinta da Póvoa, commonly known as Casa Cor de Rosa (Pink House) and its Stables. This initial phase spanned from 1985 to 1986 to accommodate the faculty, while the construction of other buildings occurred between 1987 and 1994.

The setting works as a hinge between the steep terraced topography, supported by traditional stone masonry walls associated with 19th-century bourgeois villas, offering a continuous visual connection with the Douro River estuary to the south. To the north, it relates to the most recent area of Campo Alegre, and specific infrastructures like high-traffic roads, like the Panoramic Road to the north and the Arrábida Bridge. To the west, a small road links the site to Campo Alegre Street. Designed to integrate harmoniously with its surroundings, the architectural approach reflects Siza's intent to respond and merge the complex into the context. Therefore, not only does it appear as a fragmented mass, but it also follows references present in the surroundings: the towers' height, width and alignment are determined by the Casa Cor de Rosa. Landscape interventions respected the preexisting elements, such as the natural terraces, minimally enhanced by earth moving and traditional stone masonry walls. Additionally, Panoramic Road, near the south façade, was redesigned to enhance the site's connectivity. Despite budgetary constraints, the design of the outdoor space becomes an opportunity to create additional leisure spaces. A symbolic entrance marks the western corner of the triangular site. The preexisting stone walls of the Quinta da Póvoa are interrupted by a new access created by Siza, connecting the two construction sites and leading directly to the Carlos Ramos Pavilion's entrance.

The complex was designed to house the Faculty of Architecture as an independent unit within the University of Porto, since it had previously been part of the School of Fine Arts. In 1982, Álvaro Siza was invited by the Rectory to design the new faculty building. Fernando Távora, a former teacher of Siza, played a decisive role following the separation of the architecture course from the School of Fine Arts, which determined the need for new facilities. Hence, Siza's first commission in Porto after the social housing projects of the mid-1970s was to design the city's first dedicated architecture school, with a capacity for 500 students. A tight budget and strict distribution areas were some of the difficulties the architect claims to have faced at that time. Situated in Massarelos, an area undergoing extensive urban transformations, including the construction of the Arrábida Bridge (1963) that determined the opening of new roads to connect the city centre and its surrounding highways, resulting in the destruction of the preexisting landscape, once dotted with manor houses and gardens.

Collaborators on the project included Peter Testa, Adalberto Dias, Jorge Carvalho, Eduardo Marta da Cruz, Luís Mendes, Chiara Porcu, José Manuel Resende, Avelino Silva, Ana Williamson, João Pedro Xavier and Matthew Becker. Structural Design: G.O.P. - Gabinete de Organização e Projectos, L.da. Eng.º J. de Araújo Sobreira.

Preservation efforts also extended to the gardens, complemented by the construction of the Carlos Ramos Pavilion. Initially conceived as a horizontal volume, the Pavilion's design evolved under Távora's close advice to protect the garden and the conditions imposed by the site determined its U-shaped form around the existing fagus tree. Also, for that reason, one of the corners of the ground floor is bevelled to prevent any damage to the roots of the eucalyptus nearby. The Carlos Ramos Pavilion results from an effort to maintain the relationship between the manor house and the garden. Siza intended the Pavilion to have the same look and texture as the preexisting buildings, so he opted for white-painted plaster over the insulation, giving it a similar appearance but assuming the new building was a new intervention in the garden. The 2nd phase, taking place between 1987 to 1993, involved the construction of the new faculty buildings on the lower level. Initial sketches show a compact squared volume with an inner patio, but subsequent drawings reveal a shift towards a fragmented design that embraced the surrounding landscape. In this way, and with the creation of a series of platforms that follow existing alignments suggested by trees, constructions and the former terraces, Siza is not far from the initial idea of the inner patio. Despite strict programme requirements, Siza insisted on incorporating a courtyard to address the lack of communal spaces for students.

The Quinta da Póvoa garden and its annexes were renovated and partially reconstructed, culminating in the construction of the Carlos Ramos Pavilion situated in the northwestern corner. To respect the surrounding space and its limits, the building takes a trapezoidal shape, enclosing an exterior patio while framing the garden and its trees. The entrance is located in a corner, strategically positioned within the structure. The composition of the south façade reflects anthropomorphic inspiration, evident in the layout of the windows and doors. Overall, the architect intends to pedagogically integrate international references with traditional and local features, both conceptually and formally. Non-literal evocations of Michelangelo, Adolf Loos, Le Corbusier, Alvar Aalto and Frank Lloyd Wright, among others, are creatively combined with vernacular elements resulting in a unique and exceptional design.

The volumes of the main building are subdivided into two distinct wards that converge to the west, defining the primary access and the central triangular patio. While the northern volume is conceived as a solid mass to protect the site from the highway noise, the four towers to the south, linked by a semi-buried gallery, ensure visibility from the patio and northern building towards the river. With the same aim, the wards feature differing floor levels; the ground level of the southward is three meters lower than the northern ward. Between these towers, south-facing patios provide ventilation and natural light to the gallery. The connection between the two wards occurs underground, at the western end of the triangle. Like the Carlos Ramos Pavilion, anthropomorphic figures are suggested by the window shapes and arrangements.

The functional programme of the Faculty of Architecture is distributed between the different volumes. In the north building, the main entrance and common services, including the bar, secretariat, auditoriums, exhibition gallery and library are in sequential order, from west to east, progressing from most public to private spaces. Additionally, management and administrative offices are situated in proximity to the secretariat within this building. The towers house the classrooms and some of the professors' offices, as well as services like the stationery shop. Casa Cor de Rosa and its annexes host the Research and Development unit (the Centre of Studies for Architecture and Urbanism, CEAU).

In the design of the Faculty of Architecture, light plays a fundamental role, as seen in many of Siza's architectural works. The orientation of the towers' classrooms varies, and the variety in window shapes allows users to have different perceptions of light and landscape framings The attention to lighting is particularly noticeable in the library, with its iconic glass keel-shaped skylight.

Furthermore, the intricate system of pathways, including stairs and ramps, creates a unique phenomenological experience for visitors, transforming the building into a practical teaching tool for architecture students.

The absence of a defined entrance to the building leads first-time visitors on an exploratory journey around it.

The construction technology employed in the two main wards of the building complex consists of load-bearing walls and reinforced concrete slabs, with thermal insulation on the external side with an ETICS system. The final layer consists of thin plaster based on acrylic mortars, reinforced with a fibreglass mesh, and applied in multiple layers. The base of the buildings is finished with granite and limestone cladding. The roofs are covered with a zinc standing seam system, consisting of a light concrete slab, thermal insulation of black cork agglomerate, and zinc sheet cladding. The Carlos Ramos Pavilion has an inverted flat roof, composed of a light concrete slab, an asphalt membrane for waterproofing purposes, thermal insulation in extruded polystyrene sheets, a geotextile blanket, and a heavy protective layer of gravel.

From the integrated artworks to the design of pavements, handrails, lighting, and furniture (chairs, drawing tables, etc.), the building is a consummate example of multi-scalar design.

The international impact of this building is intertwined with the prestige of the educational institution it houses. The Faculty of Architecture of the University of Porto is an exceptional architectural ensemble with significant national and international recognition. Since its construction, it has been extensively photographed, filmed and published, transmitting the influence of Álvaro Siza in the context of 20th-century architecture and of the "School of Porto".

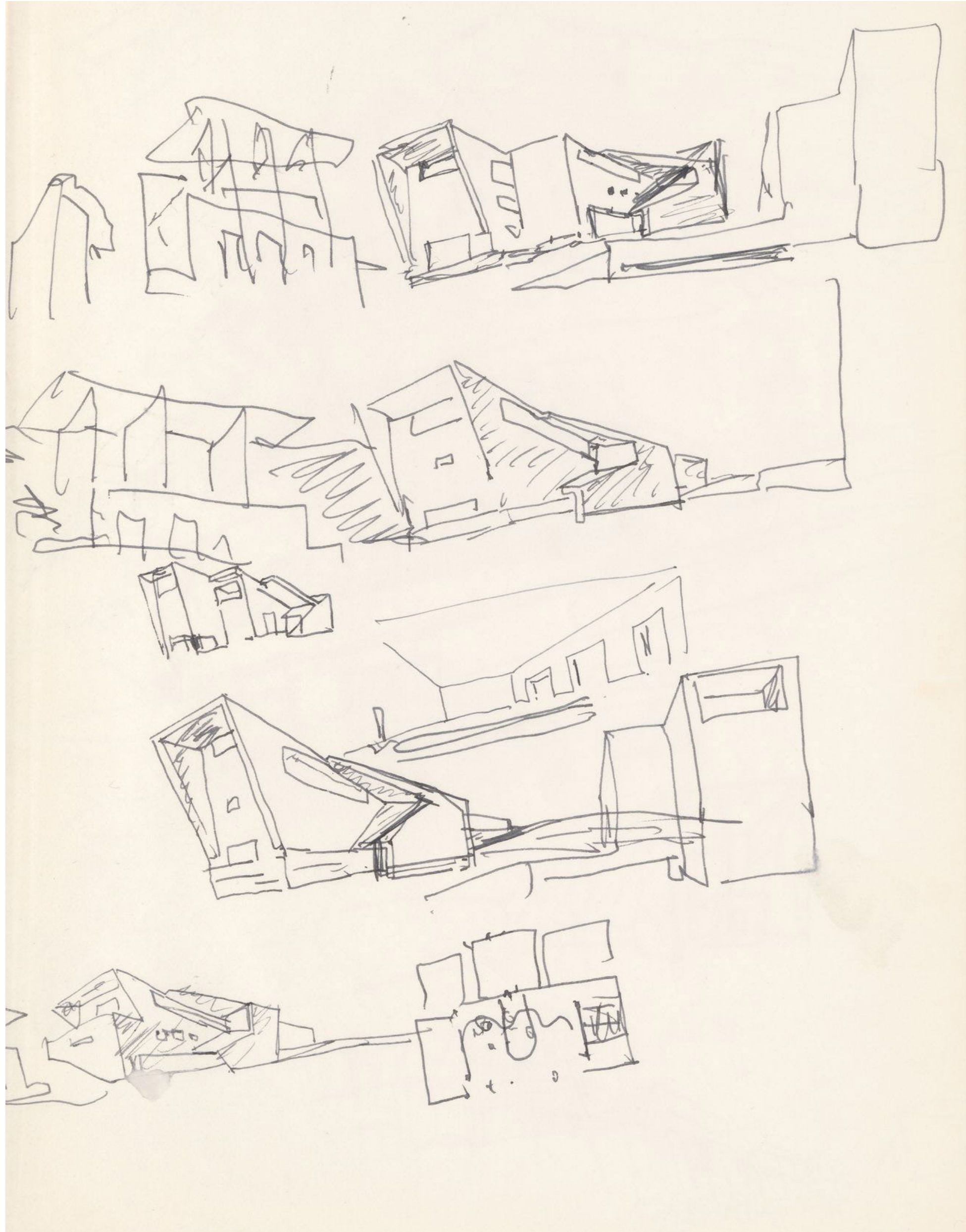
It is a pilgrimage destination for students, architects, artists and scholars and a reference for the identity and memory of an extended community.

In 2016, twenty-four years after the new buildings' inauguration, the Rectory of the University of Porto promoted a comprehensive conservation intervention of the buildings' external envelope, including roofs, façades, and window frames. This intervention addressed various issues that arose from the natural ageing process of the structures. At the roof level, deterioration of the cork agglomerate and deformation of zinc flashing had caused infiltration problems. Exterior wall anomalies included cracks, stains, biological colonisation, surface layer detachments, blisters, and perforations. Moreover, exterior window frames showed paint wear and detachment, with some areas presenting signs of iron corrosion. Some frames were deformed, with some parts either missing or damaged. The conservation efforts aimed to preserve the building's original image while preventing further deterioration. Subsequently, a conservation project for the Carlos Ramos Pavilion quickly followed these works. The intervention preserved all external and internal features, with exceptions made for the linoleum floor (replaced with a similar material), toilets, technical devices, and the distribution of light fixtures, adapted to a more flexible use of interior spaces.

The Faculty presents itself as the material demonstration of a pedagogical project – the "School of Porto", known for its critically modern, contextual architecture – that has influenced multiple generations of architects. Kenneth Frampton, in "Modern Architecture: A Critical History" (1993), ranks it as the third most significant design school to be built in the 20th century, after the Bauhaus (1925) in Dessau and the Hochschule für Gestaltung (1953) in Ulm. The Faculty has made a lasting impact on architectural education and practice, serving as a cultural and artistic reference both locally and nationally.

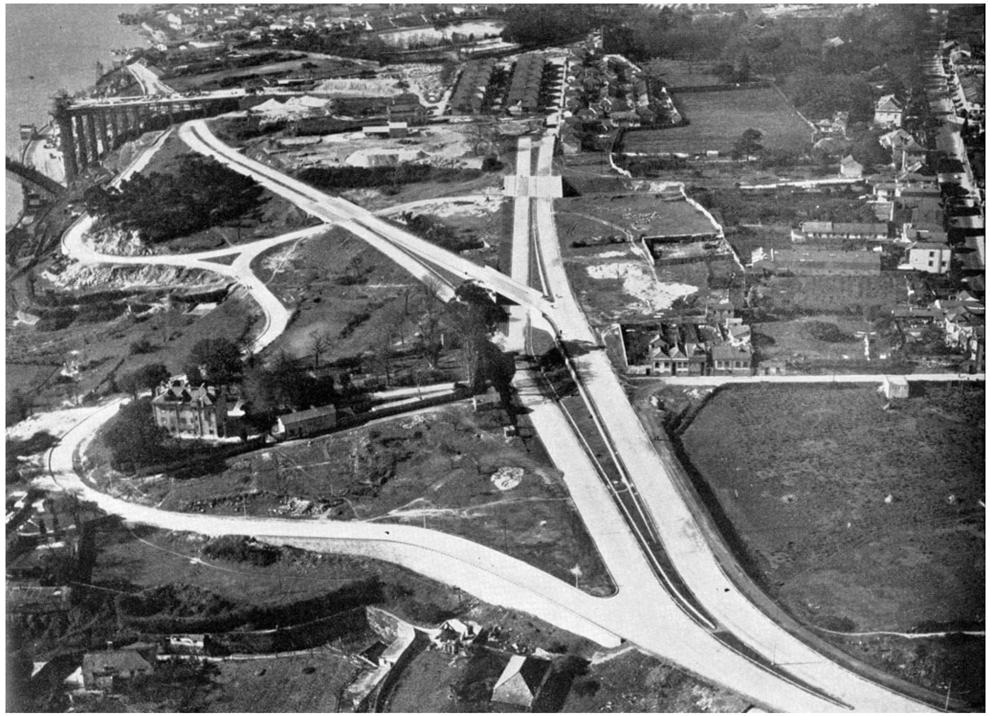
02. Preliminary designs for the towers.

03. Preliminary designs for the towers.

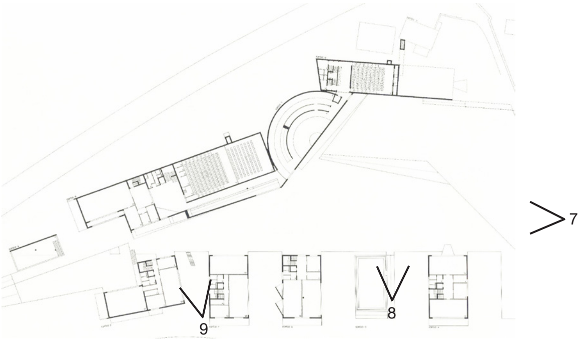


04. Preliminary design for the entrance building.

05. Campo Alegre area before the construction of the Faculty.



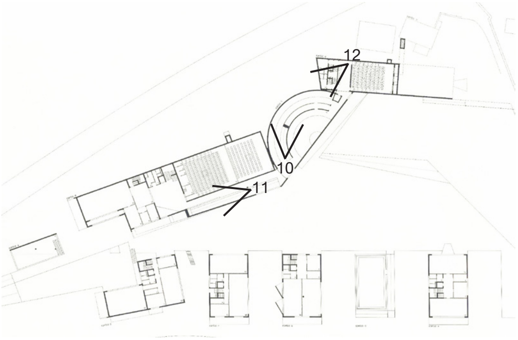
06. Quinta da Póvoa during the construction of the Arrábida bridge



07. Patio.

08. Ramp between the towers.

09. Main building entrance.

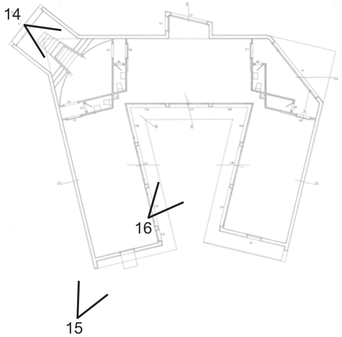


10. Exhibition gallery.

11. Main entrance ramp.

12. Library staircase.

13. Library reading room.



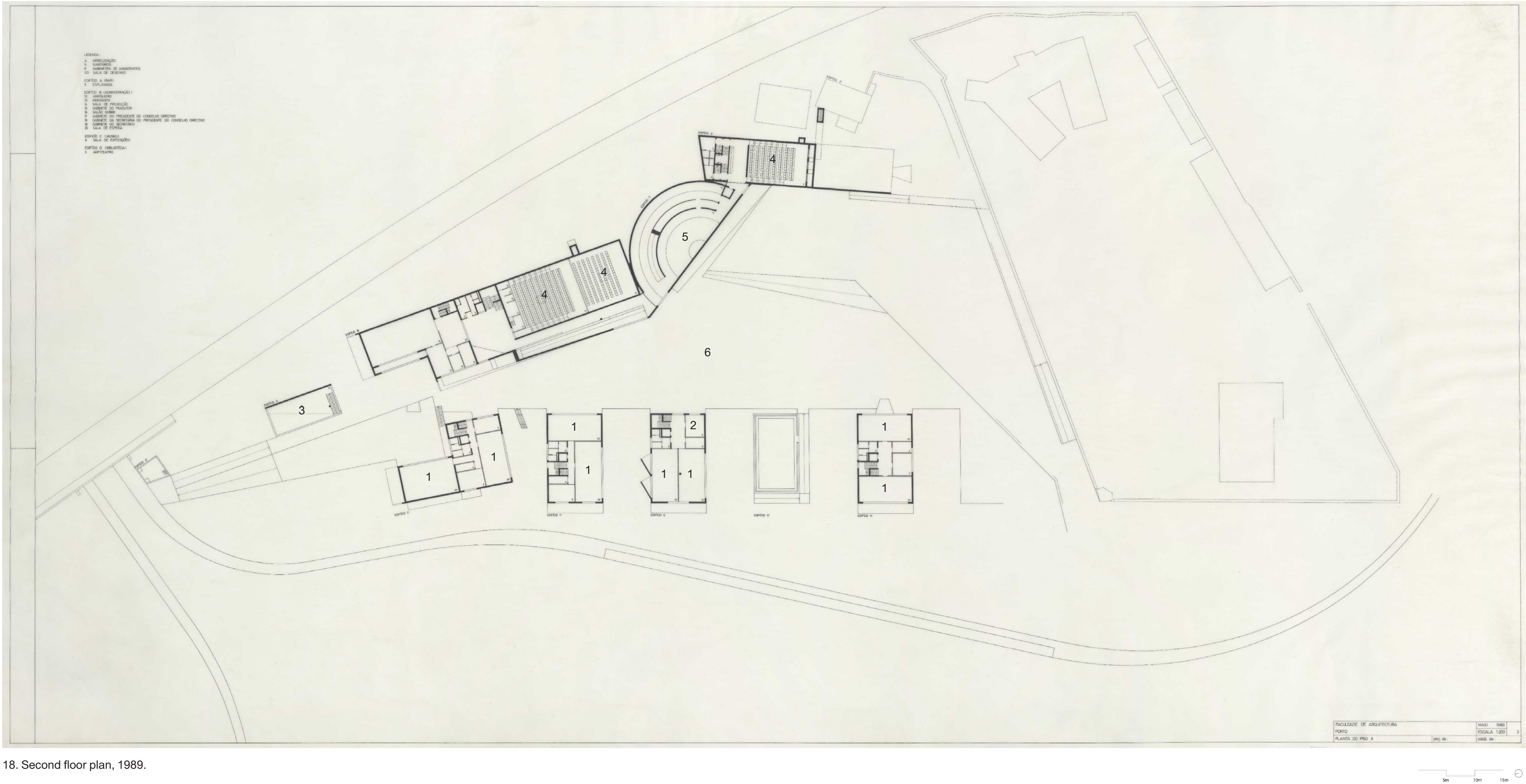
14. Carlos Ramos Pavilion entrance.

15. Carlos Ramos Pavilion south façade.

16. Carlos Ramos Pavilion patio.

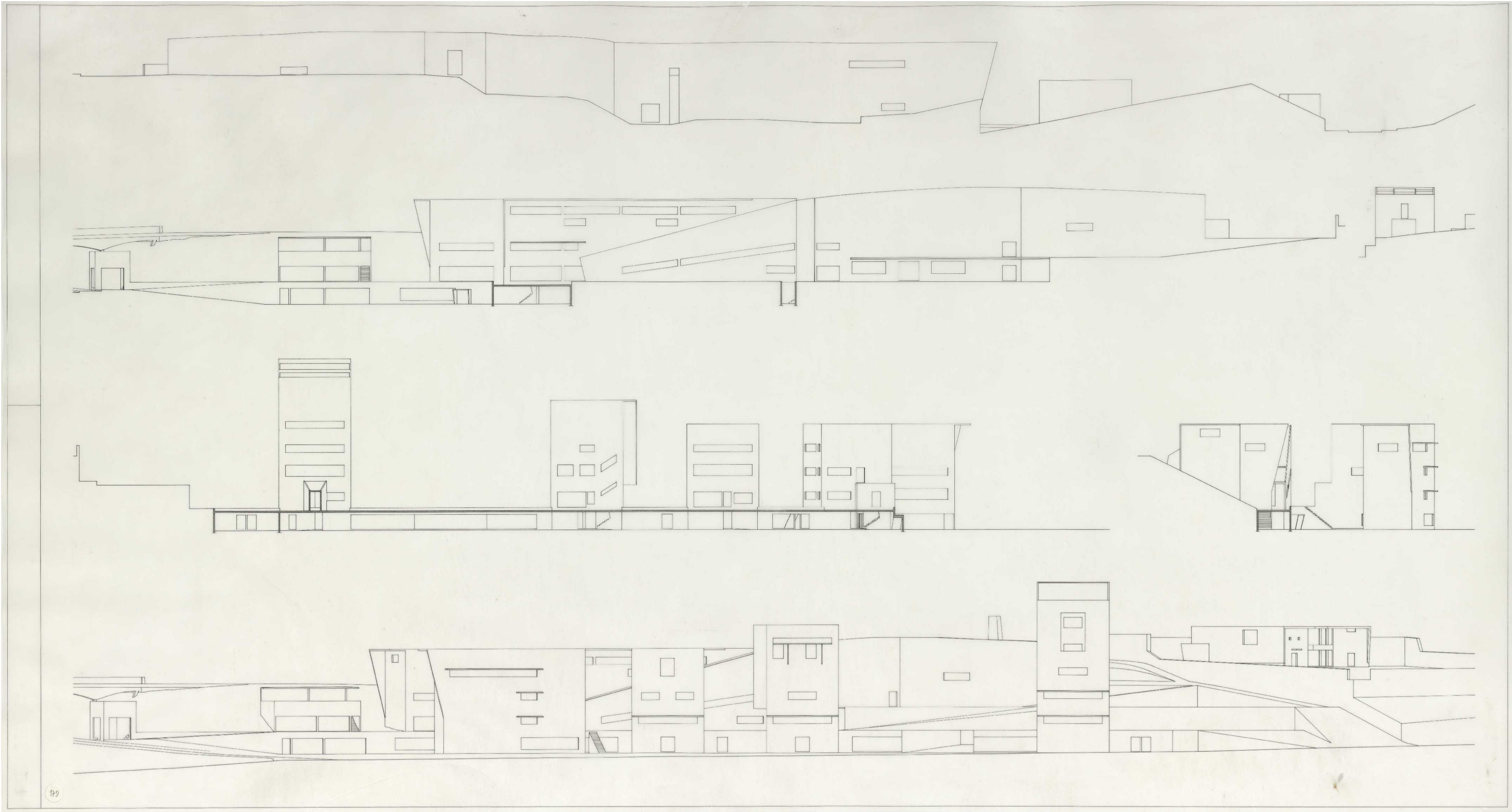
1. Classroom 2. Office 3. Bar 4. Auditorium 5. Exhibition gallery 6. Patio

17. Ground floor plan, 1989.

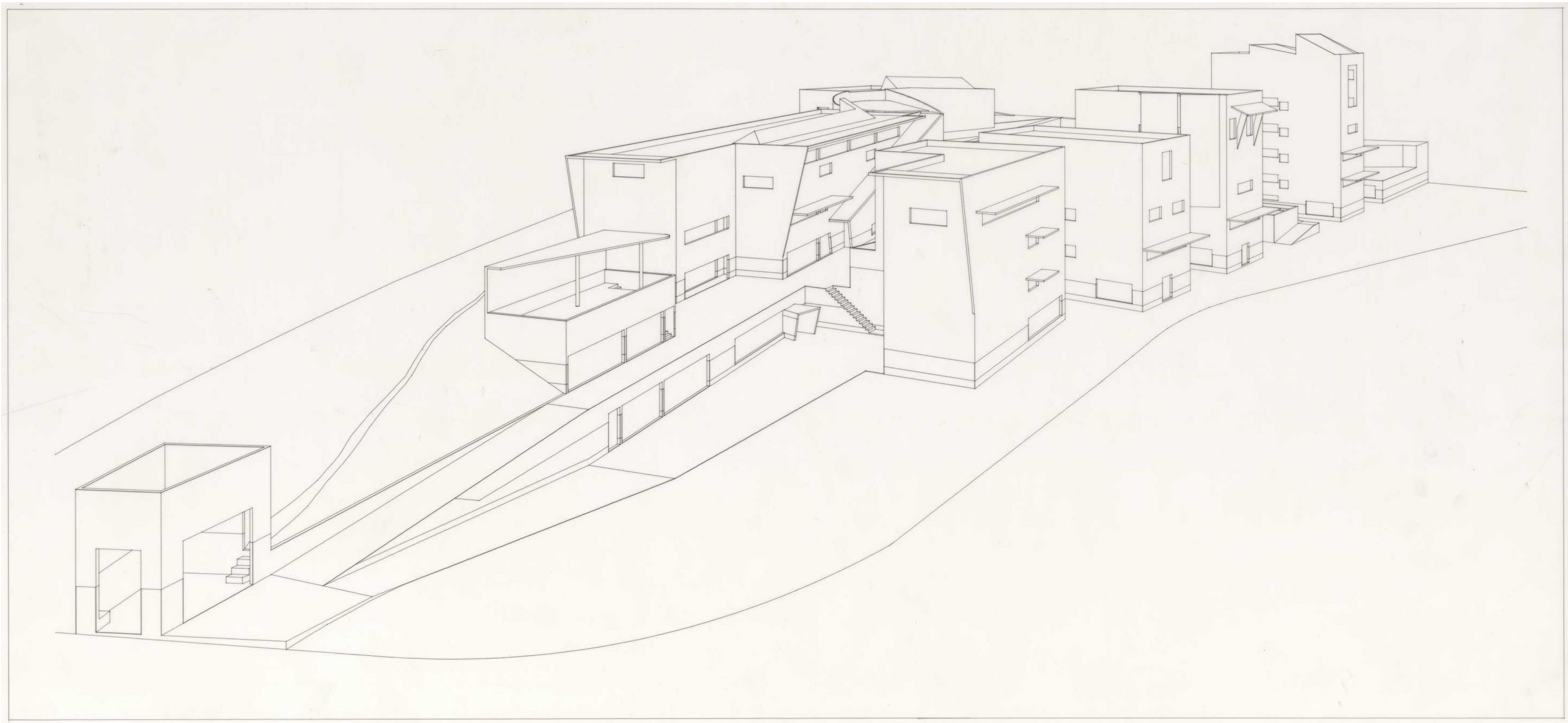


18. Second floor plan, 1989.

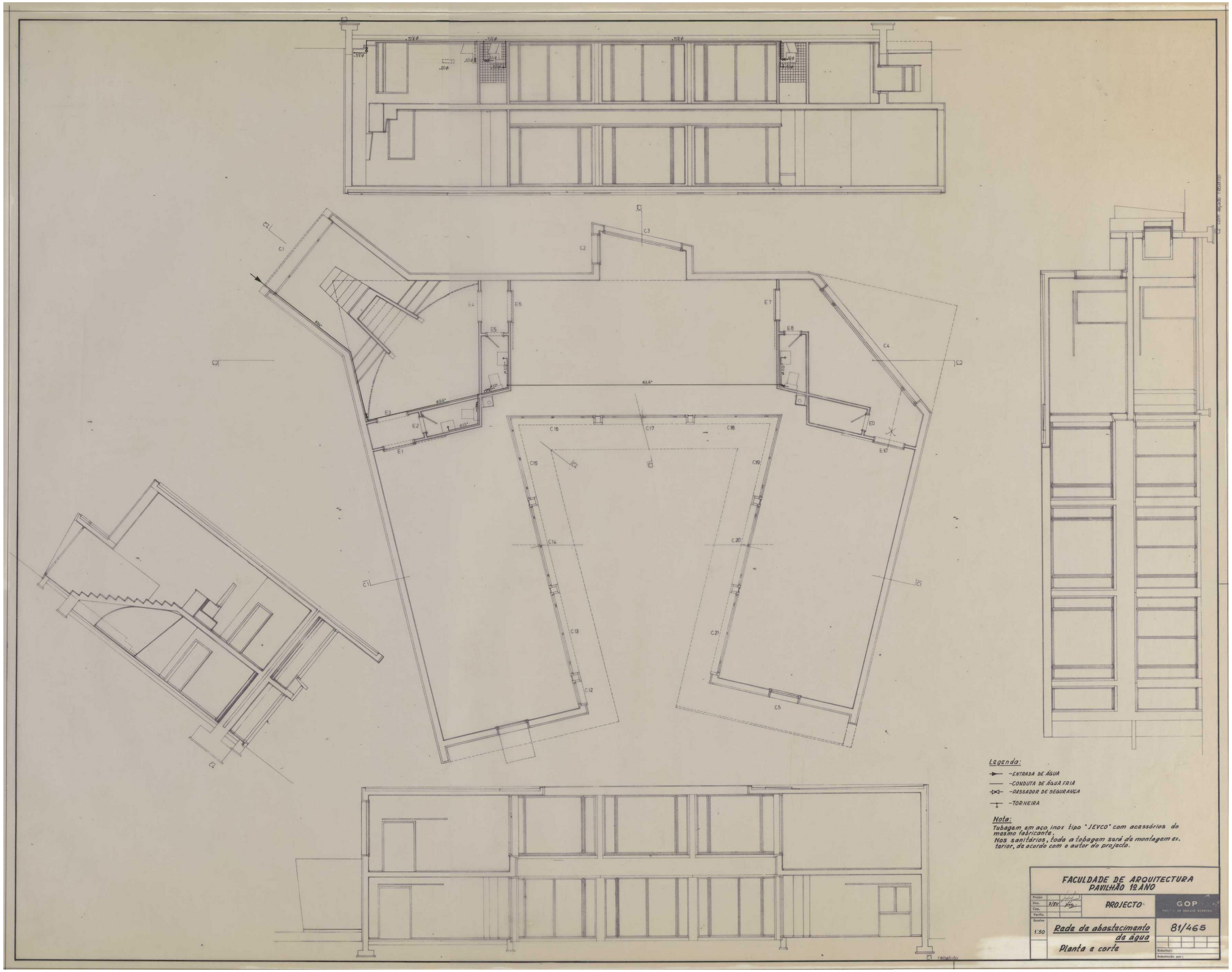
18. Second floor plan, 1989.



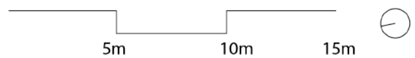
19. Elevations, 1989.

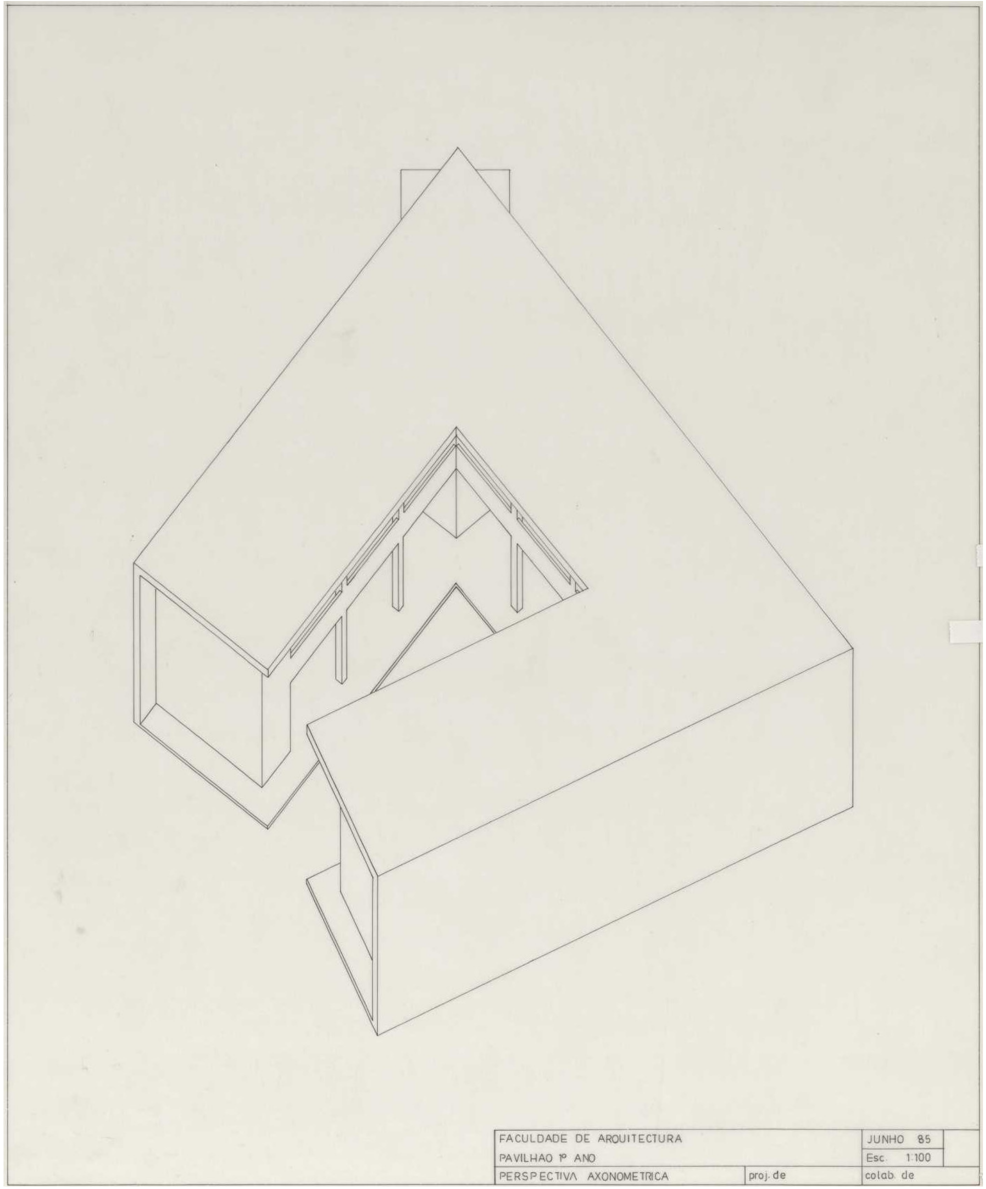


20. Axonometric.

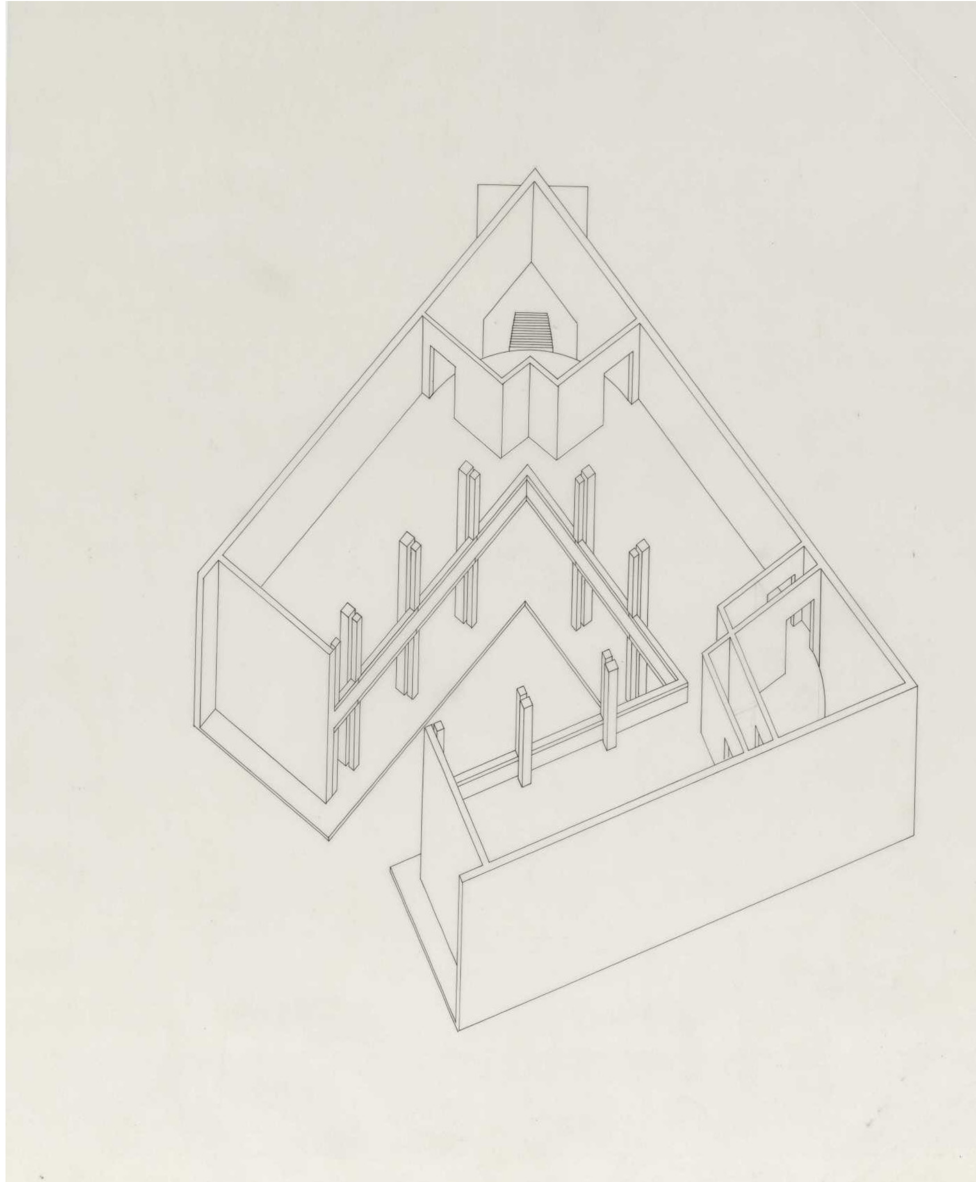


21. Carlos Ramos Pavilion plan, elevations and section, 1985.





22. Carlos Ramos Pavilion axonometric, 1985.



23. Carlos Ramos Pavilion exploded axonometric, 1985.

CONSTRUCTION

STRUCTURAL SYSTEM

The Carlos Ramos Pavilion features a mixed vertical structure comprising load-bearing walls and columns. The special conditions outlined in the Specifications state that “All external walls shall be constructed with perforated bricks measuring 30 x 20 x 22cm, forming a 22 cm thick wall with the holes filled with sand or cement mortar,” and further specify that “reinforcements shall be used in the joints and in the holes of the bricks” (GOP, 1986: 73). Regarding the columns, both edge and central, and their respective footings, the document specifies that they are to be made of reinforced concrete.

The horizontal structure of the pavilion consists of beams and foundation lintels made of reinforced concrete. The floor and roof slabs, with thicknesses of 18cm and 15cm respectively, are also in reinforced concrete. The roof slab is fungiform, featuring protruding capitals on its surface.

WALLS

The exterior walls of the Carlos Ramos Pavilion are waterproofed with ‘Cerezite’ mortar (up to 5mm thick), over which extruded polystyrene thermal insulation was applied, along with a 2cm thick wire mesh for anchoring the shotcrete.

The exterior wall surfaces feature a separation frieze in tile, measuring 2 x 15cm, at the level of the entrance threshold, separating the area near the floor from the rest of the wall. According to the author, “when touching the ground, the white walls delineate, with a black line, the surface exposed to moisture, to the contamination from green” (SIZA, 2006: 225). On the façades facing the courtyard, the pillars, parapets, and lintels of the openings are finished with ‘Ançã’ limestone of various thicknesses.

The interior plaster is traditional with a sanded finish. The toilets feature 15 x 15 cm tiles as wainscoting, extending to a height of 1.52 m. Where the wainscoting meets the floors, there is either a 5 cm high painted wooden skirting board or a black tile frieze in the toilets.

24. Construction of the concrete structure.

25. 26. Concrete structure during construction, 1990.

27. Exhibition gallery during construction, 1991.

28. Main entrance ramp during construction, 1991.

29. Library reading room during construction, 1993.

FLOORS

The ground floor is composed of a 15cm layer of crushed stone , applied over compacted soil; a layer of water-resistant concrete with a thickness of 10 cm, levelled with a mortar of cement and sand in a 1:4 ratio, the same occurring with the first floor slab.

All floors of the Carlos Ramos Pavilion have a final finish of self-levelling light-yellow epoxy, except for the stairs, whose steps are covered with 2cm thick 'Lioz' marble slabs.

The ceilings were levelled with a cement and sand plaster, finished with a lime paste, plaster, and fine sand.

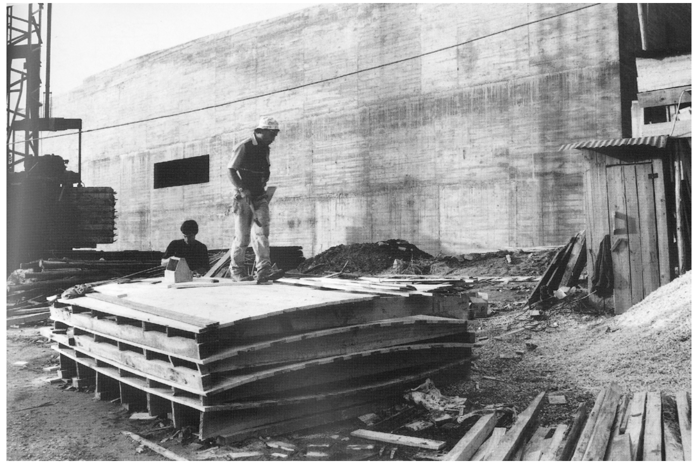
OPENINGS

The external openings of the Carlos Ramos Pavilion have wooden frames and panes made from metalized iron profiles, finished with enamel paint, and 6mm thick glass.

Inside, there are two types of doors: sliding and hinged. The sliding doors, which provide access to the rooms, are made from metalized metal profiles with an enamel paint finish, featuring frosted 6mm thick glass and frames and trim in Mahogany wood. The doors leading to the toilets and storage areas are honeycomb type with Mahogany wood edges, frames, and trim, all painted.

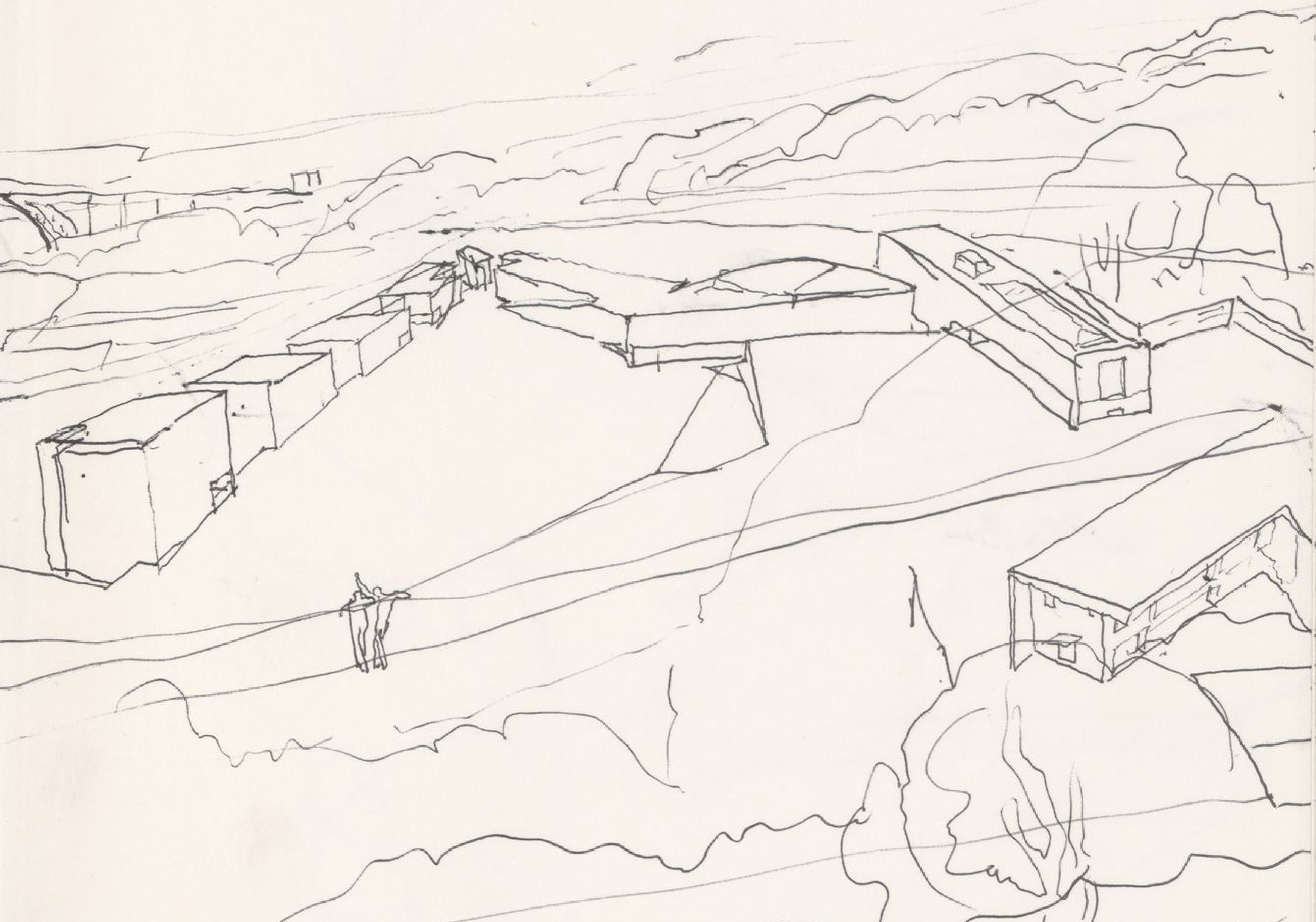
ROOFS

The roof of the Carlos Ramos Pavilion consists of a screed with a gradient for rainwater drainage. Thermal insulation consists of 3cm thick extruded polystyrene, protected by a layer of gravel approximately 4cm thick, laid over a geotextile membrane. The parapets and capitals of the columns are covered in zinc flashing. The building has four rainwater downpipes, made of galvanized iron, with a diameter of 4cm, located inside the walls facing south and on the columns adjacent to the toilets.



30. Construction site.

31. Construction site, 1989.



DESIGN PRINCIPLES

DISSOLVING THE BUILDING IN THE PARK

Returning to the idea of Fragmentation –not intended-, perhaps it can be present above all in the Faculty of Architecture of Oporto, where I built several pavilions, not a unitary building. But it has a lot to do with the enclave, a vast area of the park that is being destroyed, but will never be so because of the presence of the Botanical Garden. I played, during the project, with the idea of dissolving the building in the park (...) (Siza, 2005)

NOT TO UNBALANCE THE RELATIONSHIP BETWEEN THE HOUSE AND THE GARDEN

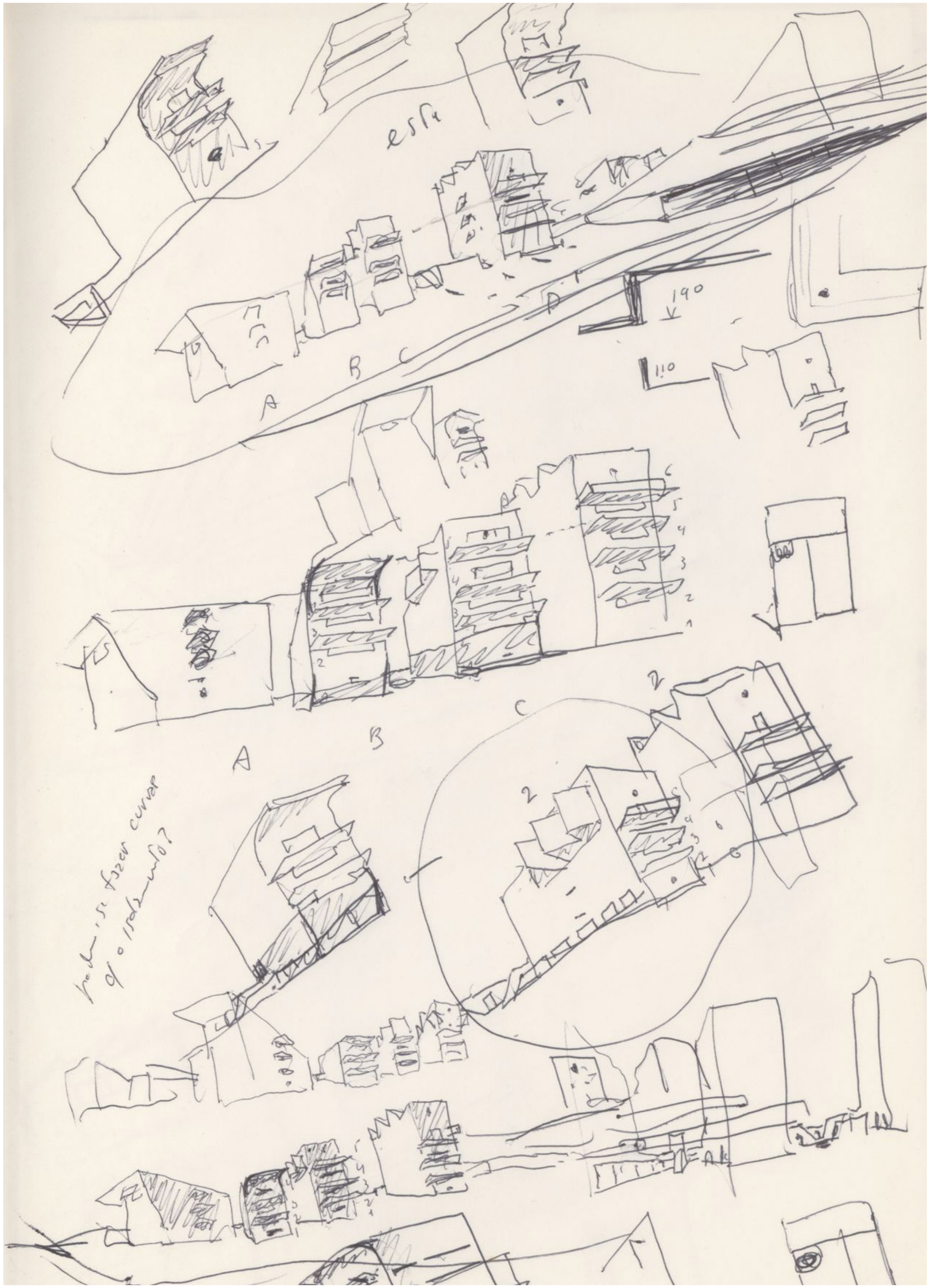
The Carlos Ramos Pavilion (...) *was very conditioned, so as not to unbalance the relationship between the house and the garden. It started in a totally different way. It was a bar and it changed precisely because of the many existing constraints. To give an example, that broken and bracketed corner is due to a eucalyptus with large roots that we didn't want to damage.* (Siza, 2016, pp. 149-150)

ORGANISE THE DESIGN ALONG AN AXIS

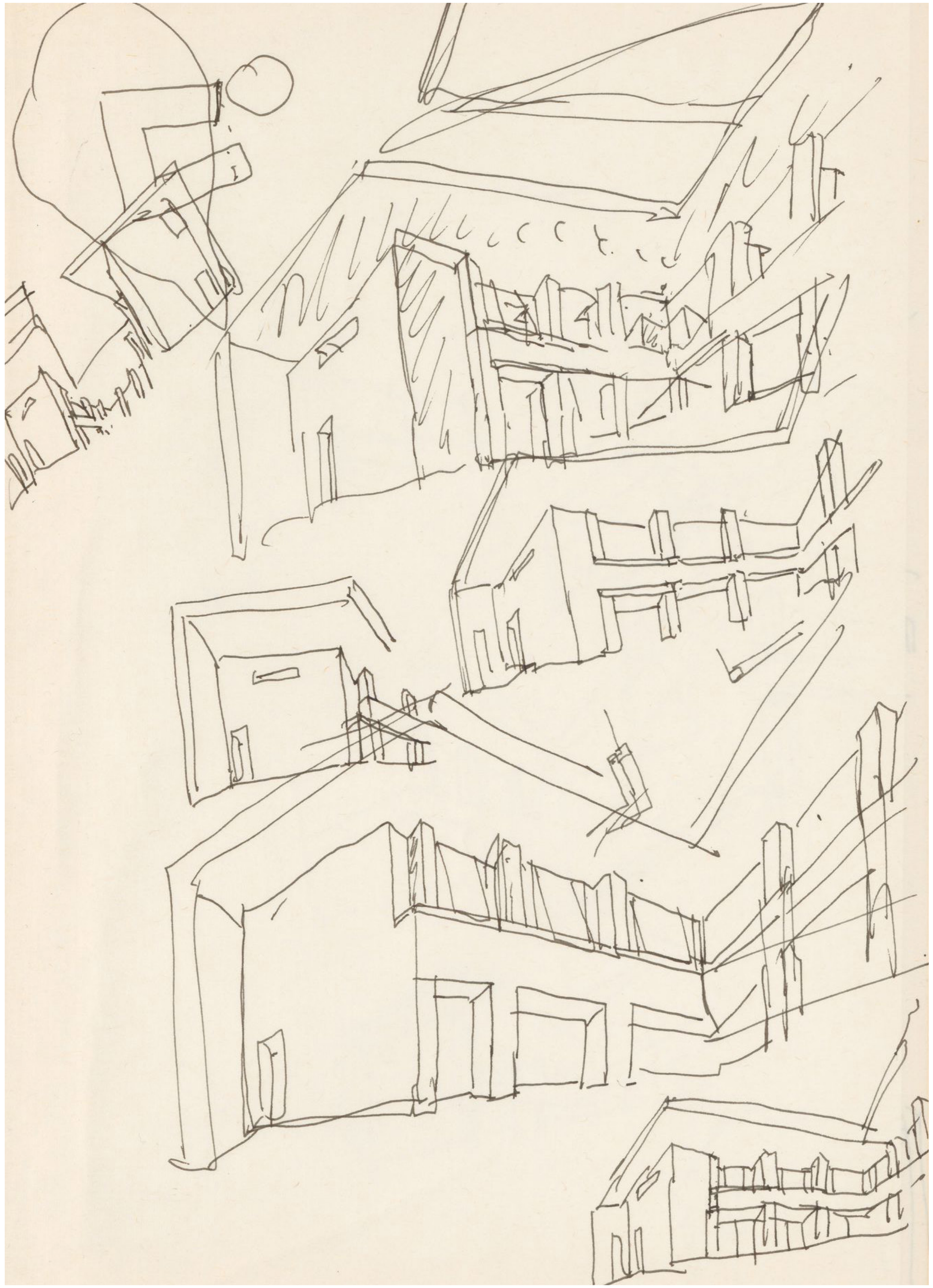
Once the idea of a large single volume was abandoned, the pink house began took on enormous importance. The decision – a difficult one given the irregular configuration of the site – to organise the design along an axis was reinforced when I realised I could develop it exactly from the the small orthogonal house. (Siza, 2009, pp. 108-109)

THE ATTRACTION BETWEEN THE PAVILION AND THE HOUSE BEGAN TO SHAPE THE PAVILION

The obvious attraction between the pavilion and the house filled the garden with rebelious and contradictory virtual axes. This sort of irresistible magnetism began to shape the pavilion, clarifying relationships, redesigning the garden and motivating a courtyard extension. (Siza, 2005, p. 225)



33. Façade composition studies.



34. Façade composition studies for the Carlos Ramos Pavilion.

VOLUMES ORGANISED IN A CONTINUITY WHICH CAN BE REMINISCENT OF A UNITARY BUILDING

While maintaining the same type of distribution, I chose a fairly slight fragmentation of the volumes. Over the course of the research, drawing led me to an organisation in pavilions. I would, however, like to say that the latter, studied in such a way as to present a well-proportioned sequence of free spaces and <u>volumes</u>, are <u>organised in a continuity which can be reminiscent of a unitary building</u>. In fact, at basement level, all the pavilions are fully connected. (Siza, 2009, p. 107)

BALANCE BETWEEN CLOSED SECTIONS AND OPENINGS

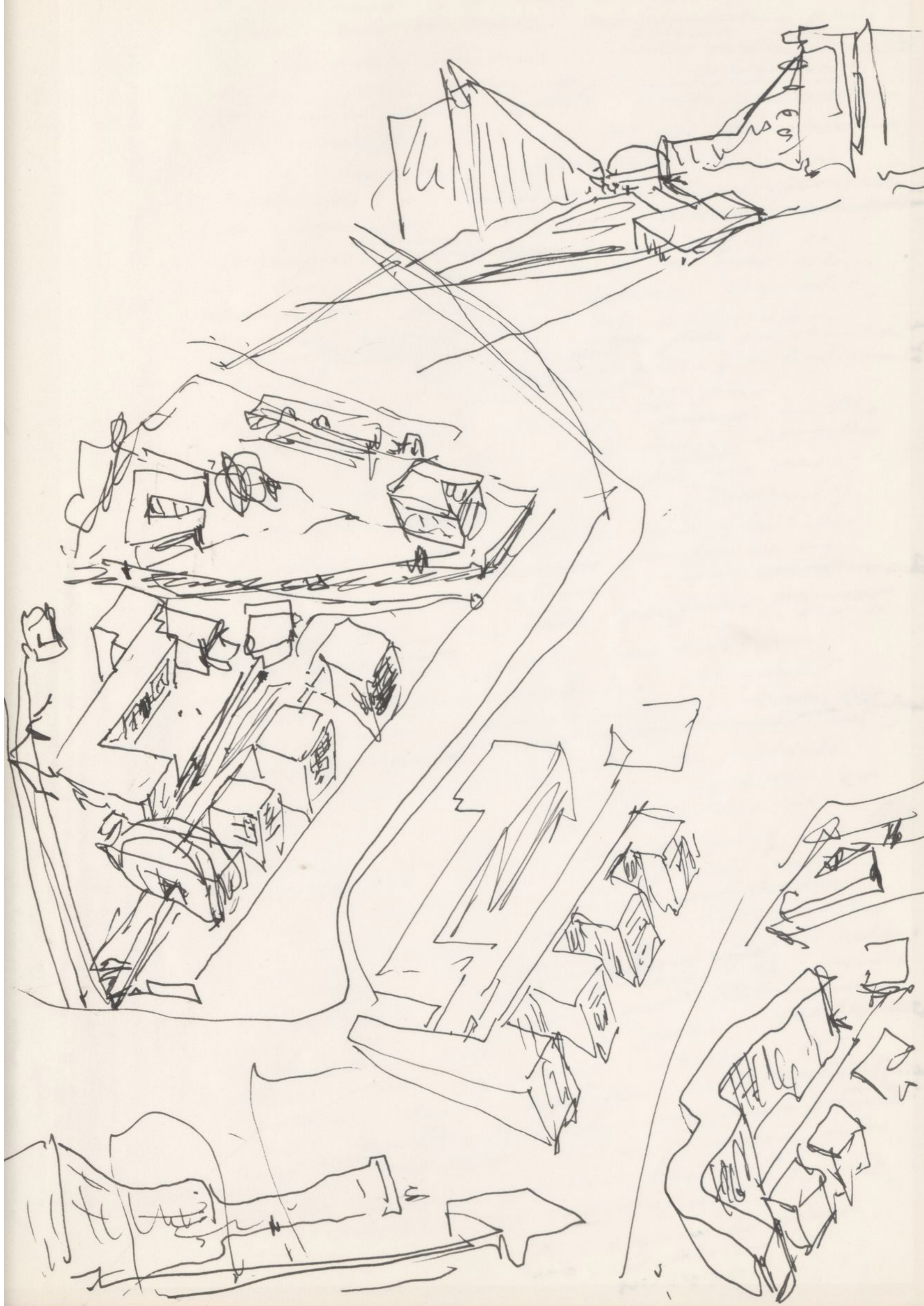
There is a rythm to these towers, with an important break that opens onto the library and the courtyard. My composition was driven by the idea of having four different towers with a <u>balance between closed sections and openings</u>. I also thought, at the time, that it would be interesting for the students to have different experiences throughout the course in terms of their relationship with the outdoors, their relationship with orientation...(Siza, 2016, p. 147)

THE FRAGMENTATION RESULTS IN SEVERAL OPENINGS TO THE PANORAMIC VIEW

<u>The fragmentation</u> of the built volume, in the south wing, <u>results in several openings to the panoramic view</u> of the river and the south margin, without prejudice to the spatial density of the triangular enclosure. (Siza, 1987)

I CHOSE THE UNITY OF WHITE

With regard to the colour, I had several ideas. (...) I finally chose the unity of white when we were halfway through construction. (...) If today the white of the building has a shocking effect on the landscape, over time the colour will take on a patina. I like the strength of the building when it appears, and then when, over time, it fades like us. (Siza, 2009, p. 115)



ATTRIBUTES

ARCHITECTURE RESPONSIVE TO A PHYSICAL, SOCIAL AND HISTORICAL CONTEXT

The component part is deeply rooted in the landscape, respecting the site's topography, traces and scale. The volumetry of the south towers evoque the scale of the preexisting house, whille the longitudinal building protects the courtyard while enhancing its community character.

INTEGRATION OF INTERNATIONAL AND LOCAL REFERENCES

The complex integrates several non-literal references to Michelangelo and Alvar Aalto, Frank Lloyd Wright, Adolf Loos, among others. Also, it relates to the vernacular granite wall terraces over the river Douro.

SCULPTURAL VOLUMETRIC EXPRESSION

While the volumetric proportion of the design studio towers at the south relates to the ancient manor house over the river Douro, the longitudinal building at the north reflects the different functions and protects the courtyard from the highway.

ORIENTED SPATIAL EXPERIENCES

Spaces are connected by a complex system of paths, both interior and exterior, through stairs and ramps where the visitor is exposed to a multiplicity of light, visual openings, forms and phenomenological experiences.

TOTAL WORK OF ART INCLUDING DETAILS, FURNITURE AND ARTWORKS

The component part is the result of a multi-scalar design approach, from the exceptional setting of the building into the landscape to the design of all details such as pavements, handrails, lighting, furniture, among others.

AUTHENTICITY AND INTEGRITY

AUTHENTICITY

The Faculty form and design has been kept unchanged since its construction. Despite the interventions in 2016, its form and design where maintained and works where held only to restore the conservation state of the building, as well as minor changes to adapt to its current use.

Despite maintaining the majority of the original materials, the recent conservation works of 2016 determined painting the façades, the replacement of thermal insulation where needed, painting of window frames and replacement of elements damaged by corrosion in the main buildings. These interventions followed the original design intentions and where held to better safeguard the building against natural elements in the future. In the Carlos Ramos Pavilion, besides the regular conservation of its elements, the pavement was replaced by one of the same appearance and glass with UV protection was placed on the windows.

The use given to the faculty is still the original use for which the building was designed. Despite the increase in the number of students that went from 500 to 1100, the Faculty is still functional and adapted to the current use.

The building's installations have been updated in the Carlos Ramos Pavilion in the 2016 intervention. Minimal changes were carried out to the electric, communication and heating installations, as well as to the drainage system of the bathrooms.

The Faculty of Architecture of the University of Porto's surroundings have suffered little to no change since the construction of the Faculty, despite some nearby constructions of faculties as part of the Polo 3 of the University of Porto development, that do not affect the building. Nevertheless, the closest surrounding areas are included in a Special Protection Zone that protects all the views and the landscape from unwanted interventions

The Faculty of Architecture is deeply connected with the nature of the surroundings, therefore its presence as an element of the design has been maintained throughout the years, including the pre-existing garden of the Villa and its listed three, a Fagus sylvatica.

INTEGRITY

All elements necessary to express the significance of the Faculty of Architecture of the University of Porto are included in the special protection zone of the property. This area includes all the buildings that are part of the property such as: the new faculty building and its towers; the Carlos Ramos Pavilion and the stables that hold classrooms; the Póvoa Villa ("Casa Cor de Rosa") that holds offices and all its gardens, the paths connecting these buildings and two more unused plots that belong to the faculty (one to the south of the property and another to the east). Some nearby houses and villas, as some empty plots to the west and highway accesses were also included to ensure the views and immediate landscape are protected. In order to solve problems that arose from the natural ageing process of the building, the Faculty buildings underwent a rehabilitation of its external envelope in 2016 (roofs, façades, and window frames). Shortly after, the Carlos Ramos Pavilion has undergone conservation works both on its interior and exterior that maintained its characteristics, only changing the linoleum floor (replaced by a similar one), the sanitary installations and other technical devices, and the distribution of luminaires to adapt to a more flexible use of interior spaces. Siza was involved in the process and due to the careful character of the interventions, aiming at restoring and safeguarding the original design, there was no damage to the integrity of the buildings. The Faculty of Architecture of University of Porto currently doesn't have development threats.

STATE OF CONSERVATION

The Faculty of Architecture of the University of Porto is in a very good state of conservation after undergoing maintenance works between 2016 and 2017. These works were funded by the Rectory of the University of Porto and were supervised by the architects Eliseu Gonçalves and José Luís Gomes under the coordination of Álvaro Siza.

The intervention comprised the external envelope of the FAUP buildings (roofs, façades and window frames). It aimed to solve problems arising from the natural ageing process caused by the building's exposure to atmospheric agents while maintaining its original design and preventing further decay. Thus, this intervention was focused on exterior maintenance works to re-establish the good condition of the buildings and safeguard their immediate and long-term viability and durability.

To address water infiltration at the roof level, hydrophobic paint was applied to the light concrete slab, and the rotting cork agglomerate (due to zinc covering deformation) was replaced with extruded polystyrene, with the application of a studded rubber waterproof membrane underneath the new zinc sheets. The flashing was also replaced by a new one with a different profile to prevent water from seeping into the walls.

Walls were subjected to different interventions, depending on the types of anomalies identified. On the areas without any visible anomalies, the walls were repainted; on the walls with stains arising from biological colonisation, a fungicide was applied, followed by a new coat of paint, after washing the surface; on the walls with detachments of the surface layer, the final coating layer was replaced and waterproofed ("Visoplast"); in case of deeper blisters, cracks and detachments, the replacement of the various layers of thin plaster was required. The areas that presented the most damage underwent the replacement of the entire "ETICS" system (including the expanded polystyrene panels).

Window frames were repainted both on the inside and outside, and some of the necessary parts to ensure the windows' proper functioning were replaced to address the damage caused by corrosion, wear and tear, and paint detachment.

The Carlos Ramos Pavilion also underwent conservation works in 2018 to solve ageing problems and adapt it to current use while remaining faithful to its original design. The main interventions concerned the replacement of the roof, the treatment and painting of external walls, the improvement of steel window frames with new glass with UV protection, the replacement of the linoleum floor, and the renovation of the bathrooms. Improvements were made to the building's technical networks, with new electric, communication and heating installations installed behind the new plasterboard walls, a new sewage system for the bathrooms, and a new distribution of luminaires for a more flexible use of interior spaces.

40. Conservation works, 2016.

41. Conservation works, 2016.

42. Intervention on the roofs, 2016.

43. Replacement of the external coatings, 2016.

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.

360º VIRTUAL TOURS

Virtual tours are an increasing instrumental in the documentation and preservation of cultural heritage, contributing communication, and conservation monitoring.

The development of the 360º virtual tours captions was guided both by the OUV attributes and the design principles of each building.

Images for these tours were acquired by a Ricoh Theta camera, ensuring precise timing and favorable weather and light conditions. Subsequently, the virtual tours were processed and enabled using software developed by detalhar.pt. The QR codes in the booklet allow for interactive virtual tour experiences of the buildings, focusing on the main attributes and design principles.

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.

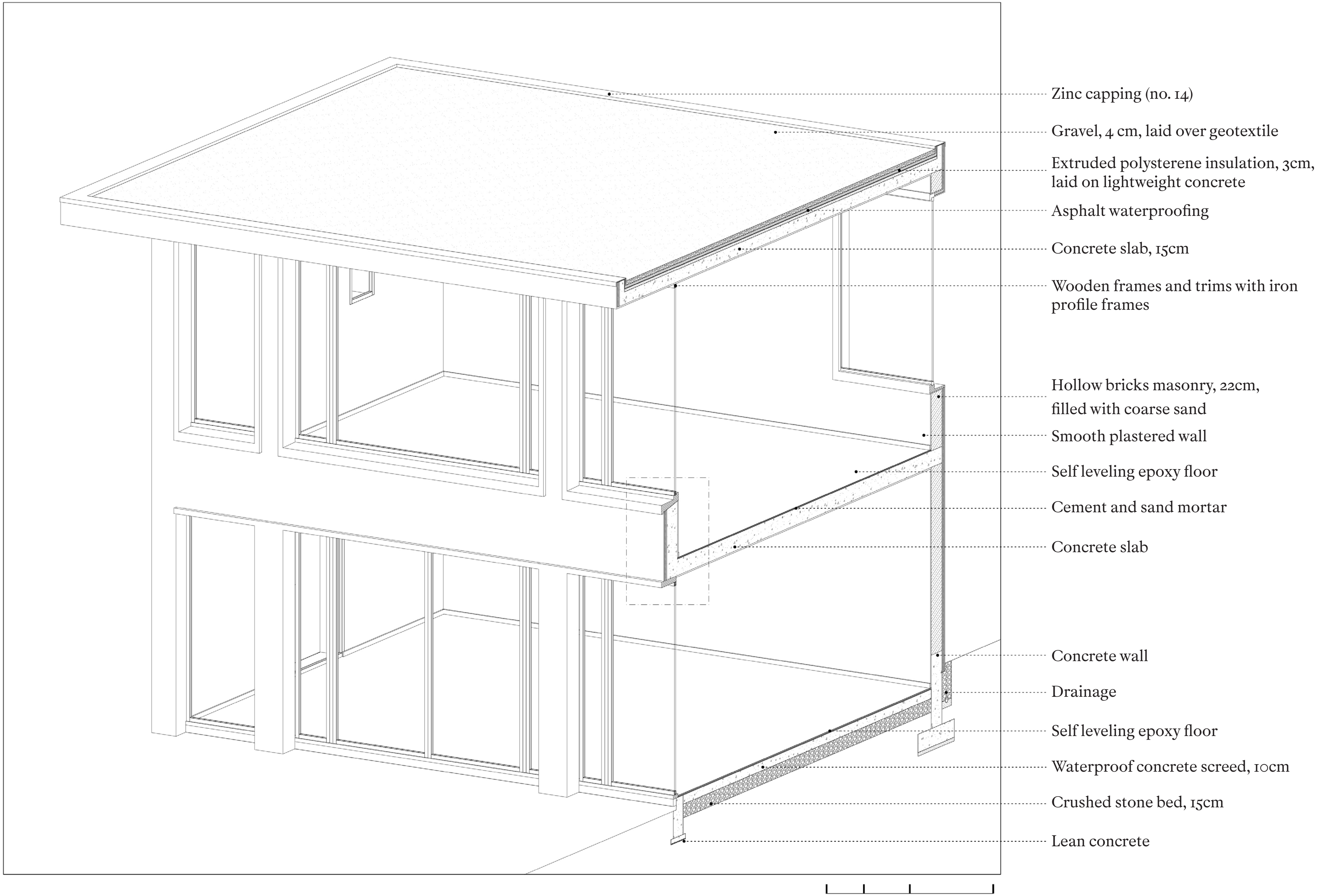
Drawing representation takes inspiration from Edward Ford's "The Details of Modern Architecture" these models prioritize clear language to disseminate knowledge effectively. The development process of the models involves cross-referencing analysis between archives and bibliography research combined with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

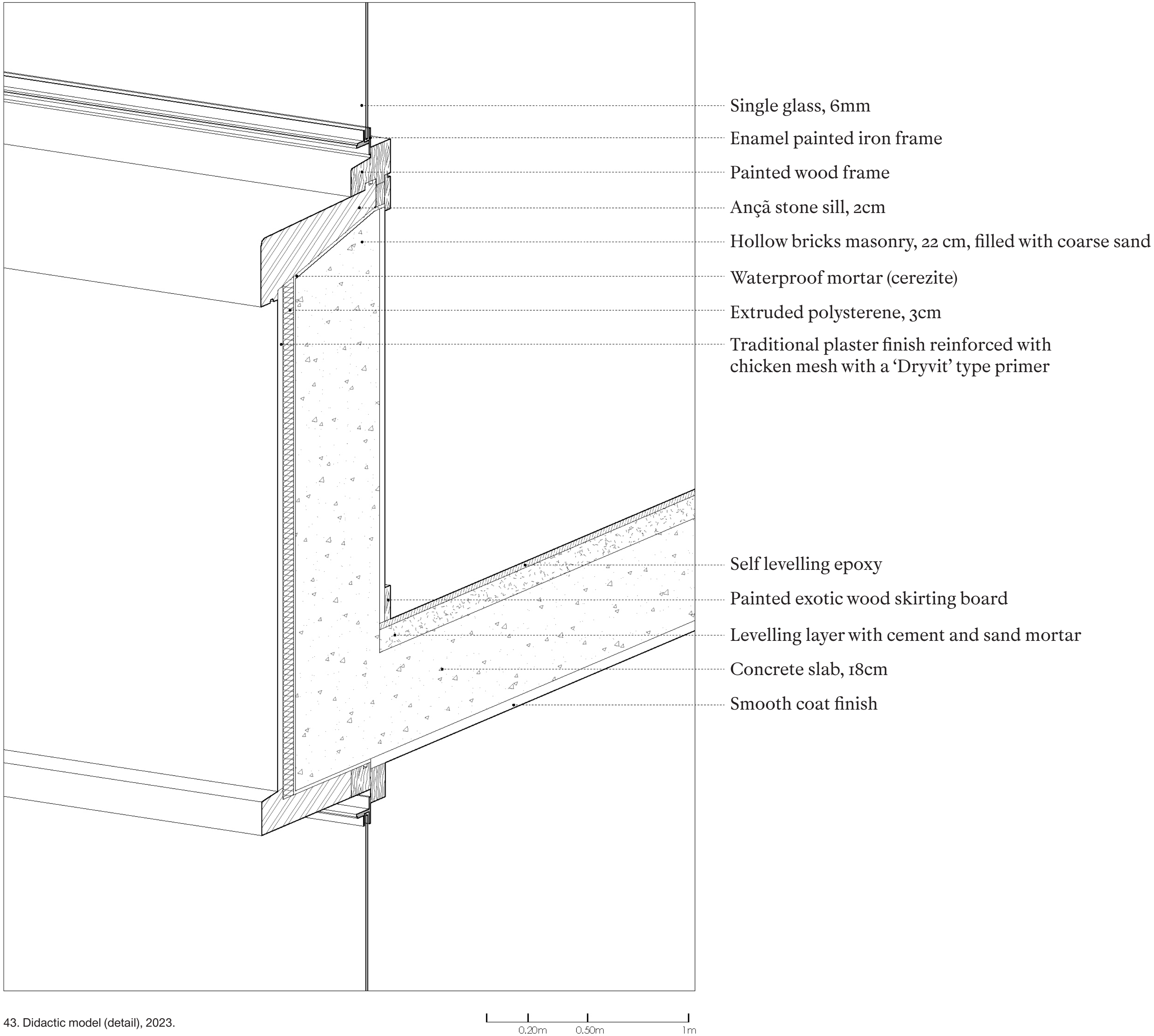
44. 45. 46. Photogrammetry, 2023.

47. 360º Virtual Tour, 2024.

Virtual Tour



48. Didactic model, 2023.



43. Didactic model (detail), 2023.

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