

# Alvaro Siza's Tectonic Shift in Leça da Palmeira: From Design to Conservation

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**Abstract.** From 1958 to 1966, Álvaro Siza Vieira (Portuguese Architect, Pritzker Prize-winner in 1992) designed two paradigmatic works along the seafront in Leça da Palmeira, near Porto, in the north of Portugal: the Boa Nova Tea House (1958-1963) and the Ocean Swimming Pool (1959-1966). Although these projects were built on the same coastal road and were designed almost simultaneously, their tectonic principles are quite different: in the Tea House, Siza uses traditional materials mixed with modern ones, attempting to combine vernacular constructive elements with the use of modern technologies; on the contrary, in the Swimming Pool, the architect adopts a modern technology and an abstract neoplastic language. This tectonic shift can be explained by the evolution of the Portuguese architectural debate during the 1960s.

Both buildings are now listed as National Monuments (2011) and have been included in the Portuguese Tentative List for World Heritage (2017). Furthermore, they have been subjected to recent interventions by Álvaro Siza himself (Tea House, 2013-2014; Swimming Pool, 2019-2020). Focusing on the technological and material legacies, this paper seeks to analyse the life cycle of these buildings, from their original design to their ageing process and transformations, including recent conservation work. Moreover, this paper also reflects on two different approaches to one of the most challenging issues in the conservation of modern architecture: concrete repair and its maintenance over time.

## 1. INTRODUCTION

### 1.1. Context

From the late 1930s onwards, Portuguese architecture was dominated by a set of stylistic rules imposed by the *Estado Novo* (the dictatorial regime of António Salazar), which sought to impose a fictional concept of Portuguese architecture (associating alleged vernacular values with a monumentality inspired by Nazi Germany and Fascist Italy) that implied a representation of the oppressive power of the state.<sup>1</sup>

The 1948 Congress of Portuguese Architects<sup>2</sup> was a historic moment, marked by the affirmation of two groups of young architects who demanded a modernisation of processes and languages: the members of ICAT (Technique and Art, Cultural Initiatives, formed in Lisbon in 1964) and ODAM (Organisation of Modern Architects, founded in Porto in 1947).

Subsequently, modern architecture was again admitted in Portugal, at least in private buildings.<sup>3</sup>

In 1955, the *Estado Novo* made one final attempt to promote a 'Portuguese character' in architecture, through the *Surveys on Portuguese Vernacular Architecture*, organised by the Union of Portuguese Architects;<sup>4</sup> however, the *Surveys* clearly demonstrated that there was not one single 'Portuguese architecture', but instead various regional expressions that were recognisable throughout the territory. The success of the book *Popular Architecture in Portugal*<sup>5</sup> (1961) led to the reuse and reinterpretation of traditional construction systems, which demonstrated the compatibility between the vernacular legacy and the modernist values of pragmatism, functionality and truthful tectonics.<sup>6</sup>

Therefore, during the 1960s, most Portuguese architecture followed a regionalist trend; however, it was becoming clear for a few architects that the formal aspects of this vernacular influence were crystallising "a reality that was, in fact, rapidly disappearing and could not translate the contemporary times".<sup>7</sup>

This context explains the tectonic shift in Siza's work, and, in this particular case, from the Boa Nova Tea House to the Ocean Swimming Pool, which was also related to the assimilation of different international references<sup>8</sup>.

Since very little has been published on the technological and material features of these works, the methodology of this paper is based both on archive research (conducted at the Matosinhos Municipal Council), combined with the direct observation and analysis of the architect's built works, and on interviews with Álvaro Siza, involved engineers, collaborators and contractors.

## **2. ORIGINAL DESIGN**

### **2.1. Boa Nova Tea House (1958-1963)**

Constructed on rocky terrain by the seaside in Leça da Palmeira, the Tea House is a good example of the above-mentioned vernacular influence, which is displayed in both a conceptual and formal way.

Initially designed at the studio of Fernando Távora (1923-2005) for a public contest (won in 1956), the subsequent commission and its corresponding authorship were later entrusted by the master to Álvaro Siza (a collaborator in his office, between 1955 and 1958).<sup>9</sup> Siza's project was built between 1960 and 1963 and was "immediately recognised as a masterpiece".<sup>10</sup>

The composition of the building is based on three main principles, conceptually related with Portuguese vernacular architecture: an almost mimetic reinterpretation of the site topography, a respectful attitude in terms of the relationship with the pre-existing chapel and a constant correlation with

the landscape, achieved through the intentional design of a promenade built in Portuguese limestone.

Hence, Siza proposes the use of a mixture of traditional tectonics (timber and ceramic tiles) and modern tectonics (reinforced concrete), seeking to combine vernacular constructive elements with the use of modern technologies (pitched concrete slabs with tiled roofs and timber joinery). Most of the wooden elements are built in afzelia wood, which is used in the ceilings, in the interior flooring and in all the frames, including a set of sliding windows. Apart from the building's foundations and pillars, all of the walls are plastered and painted white. The roof's gutters and flashings are made of copper.



Fig. 1. Views of the Tea House and Ocean Swimming Pools (photos by Eduardo Fernandes)

## **2.2. Ocean Swimming Pool (1959-1973)**

In November 1959, the Matosinhos Municipal Council commissioned the construction of a bathing tank on the cliffs of the Leça da Palmeira seafront (located about one kilometre south of the Tea House), designed to allow the seawater to be naturally renewed at high tide. In accordance with this brief, the engineer Bernardo Ferrão (Fernando Távora's brother) began the study of a 20 x 33-metre tank. However, given the delicacy of the landscape, he recommended Álvaro Siza to design the pool and annex buildings.

In the first phase of the project (March 1960), Siza proposed a tank with three walls, using the pre-existing rocks as a boundary on the west side. This proposal was actually built, but it soon became clear that, for reasons of public hygiene, the water would have to be filtered and mechanically changed, which precluded the use of a simple container.<sup>11</sup> The design was presented in October 1962 and the construction took place over the next two years, with the pool being opened to the public in the summer of 1965. After September 1965, Siza designed an expansion of the bar and the technical areas, which was submitted to successive revisions until 1973. It was the construction of this new design that gave the building its contemporary image, with the 45° wall that protects the bar from the north wind.<sup>12</sup>

The tectonics of the building are dominated by concrete walls composed with very little cement and reinforcement, but with tremendous binding over time, making it a very high-quality concrete. The roofs are covered with copper sheets, supported by a structure made out of Baltic pinewood and treated with burned machine oil, giving it a very dark, almost black, colour.

## **2.3. The Tectonic Shift**

In contrast to the formal vernacular influence visible in the Tea House, the Swimming Pool building displays an abstract language, being composed of a succession of walls in reinforced concrete, running parallel to the shoreline and covered with a low-slope copper roof. In the interior, the dark timber structure is scarcely illuminated by the few rays of light that manage to penetrate through small openings between the walls and the ceiling.

Despite these tectonic differences, the conceptual principles are similar, as in both cases we find a reinterpretation of the topography. However, in the Swimming Pool, this intention led to a different design because the conditions of the site are also diverse. Siza aimed to reduce the impact of the construction as much as possible to the "three parallel lines" that dominated the site: "the meeting of the sea and the sky, the meeting of the beach and the sea, and the long support wall of the seafront". Thus, the building is "anchored, like a boat, to the marginal wall".<sup>13</sup>

Thus, the building's perfect physical integration into its setting, a characteristic feature of Siza's work (and clearly evident in the case of the Tea House) is taken to an extreme in the Swimming Pool: building and

setting merge, as the architect's intervention becomes a metaphor for the surroundings, incorporating and reinterpreting the pre-existing seaside wall. In both cases, Siza's architecture is meant to be felt, and not only seen.

The Tea House is a building that was conceived as a window, a device created with the main purpose of showing the landscape: Siza hides it momentarily at the entrance, to accentuate the surprise given by the grand opening in the lower rooms. Then, in the dining-room, the dominance of the landscape is reinforced by the mechanism of the window, which can disappear underground (as in Mies van der Rohe's Tugendhat house), leaving no barrier between inside and outside.

Otherwise, the Swimming Pool's changing rooms act as a wall, hiding the exterior view: it is a dark and dense space, between two concrete walls.<sup>14</sup> The interior is dominated by the black Baltic pinewood partitions and roof beams (darkened with burned oil), creating a disturbing atmosphere, evocative of Tanizaki's discourse on the value of shadows.<sup>15</sup>

As we exit the changing rooms, heading towards the pool with our eyes adapted to this darkness, we feel completely dazzled by the strong light of the sun, reflected in the concrete walls and pavement slabs.

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### **3. CONSERVATION WORKS**

#### **3.1. Boa Nova Tea House**

The conservation of the Boa Nova Tea House in 1992 was Siza's first intervention on an earlier work and, in his words, an important experience for his following works on pre-existing buildings.<sup>16</sup> After first declaring his intention to make changes to the original design (the work of his much younger self), Siza was able to recognise the building's value and coherence as a whole. He thus resisted the temptation to correct his own work, and decided to maintain the original design, arguing that "in a rehabilitation there is a mandatory requirement, which is (...) absolute integrity."<sup>17</sup>

In 2012, Siza was called upon to perform a second intervention for a new concessionaire, after the building had been abandoned and vandalised (theft of all the copper guttering and some pieces of furniture, as well as broken windows and damage to the roof's ceramic tiles), which further aggravated the increasing signs of decay. Apart from some damage to the technical installations and some missing furniture, the building's interior was actually in a reasonable state of conservation. As far as the decay of the concrete was concerned, there were only a few localised anomalies, such as spalling, cracking or erosion, possibly caused by the corrosion of the reinforced steel due to its exposure to chlorides, as well as to a process of carbonisation.

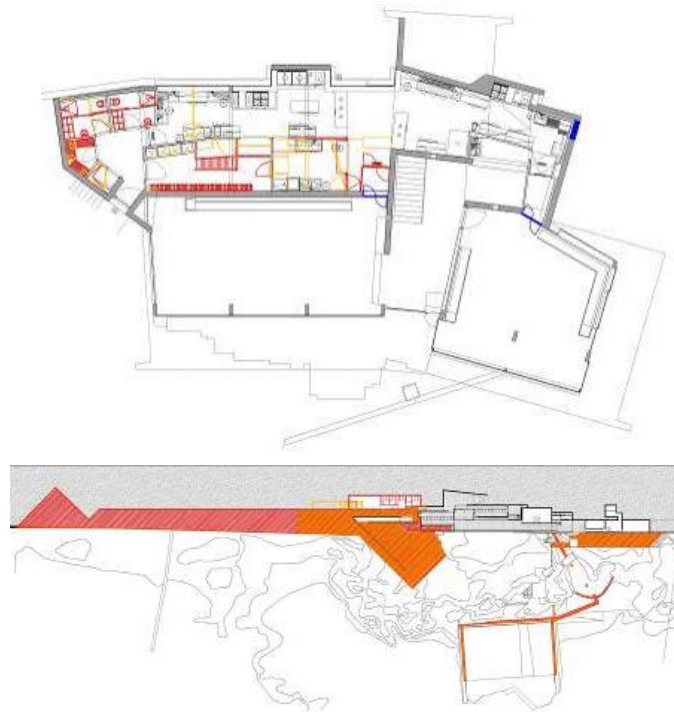


Fig. 2 - Demolitions (yellow) and alterations (red) to the Tea House (2012-2014) and Swimming Pool (design proposal, 2019). (source: Câmara Municipal de Matosinhos and Frederico Barbosa).

To solve these problems, recent interventions comprised the following works: replacement of all the roof's ceramic tiles with a new model similar to the original one, since the initial manufacturer no longer existed; replacement of the copper coverings and gutter in keeping with the original specifications; waterproofing of the kitchen's exterior walls; redesign of the basement's ceiling slab in order to insert a new staircase; reorganisation of the kitchen area and equipment; replacement of the bathroom tiles with marble, as well as of the sanitary appliances; conservation of the decaying window frames; conversion of the sliding window's mechanical opening system to a mechanism operated by electric motors; conservation and treatment of all the afzelia wood elements; reproduction of replica furniture, including the conversion of the lamps' power supply to battery. Additionally, the introduction of air conditioning was also requested, which, according to the author<sup>18</sup>, was unnecessary in such a maritime position.

The localised repair of the concrete consisted in the prior removal of the detached concrete, as well as the elimination of the oxidation and the cleaning of the steel reinforcements. Later, various other actions were performed: anti-corrosion treatment of the steel reinforcements ("emaco

nanocrete AP”), repair of the mortar filling voids and cracks (“emaco nanocrete R4”) and a smooth final coating (“emaco R205”), using wooden boards as formwork in order to provide a texture similar to the original one<sup>19</sup>. Samples were tested (with the cement production company Secil) in order to guarantee that the final solution was technically and aesthetically compatible with the original<sup>20</sup>.

In 2014, the building reopened to the public, unfortunately solely as a restaurant, without the tea house area (one of the most prominent features of its original concept, use and atmosphere), which is now used as another dining-room.

### **3.2. Ocean Swimming Pool**

The pools and buildings are mainly constructed in good-quality concrete, with a very small amount of reinforced steel: the building walls have depths of 30cm and a welded steel mesh of 5mm, with a grid of 15 x 15cm. In contrast, the slabs have wider reinforced steel bars.

The maritime exposure of the building was already causing several problems in the concrete structures in the 1980s, when the engineer Ferrão proposed the application of a 4cm concrete coating to some of the external walls. Over the years, this coating revealed problems of compatibility with the original structures and started to detach or crack (pattern cracking<sup>21</sup>). Furthermore, the absence of expansion joints in the longitudinal walls led to the formation of vertical cracks. The subsequent patch repairs of cracks with incompatible cement mortars created problems such as delamination and cracking.

In 1993, the building had an intervention performed by Siza, covering the “roofs with patinated copper, as already specified in the original plan”, but this did not significantly alter the existing building.<sup>22</sup> Recently (2019), Álvaro Siza developed a new conservation project, which mainly focused on the pools’ technical installations and the equipment of the pool tanks, as most of its pipes had been destroyed by salt or were clogged with sand. Moreover, this same intervention envisaged the reconstruction of the north side of the swimming pools in order to improve the bar’s services and facilities.

Despite their quality, most of the concrete structures, such as the walls in the north side and the small bridge that leads to the swimming pools, were already in an advanced state of decay, with all of their reinforcements corroded. In addition to the spalling related with steel corrosion, the main signs of decay are the above-mentioned ‘pattern cracking’, erosion of the surfaces of the concrete elements and patches caused by incorrect interventions (Fig. 3). The wooden elements in the interior do not reveal much damage, but incorrect interventions had given it a very oily texture and all the metal elements showed signs of oxidation.



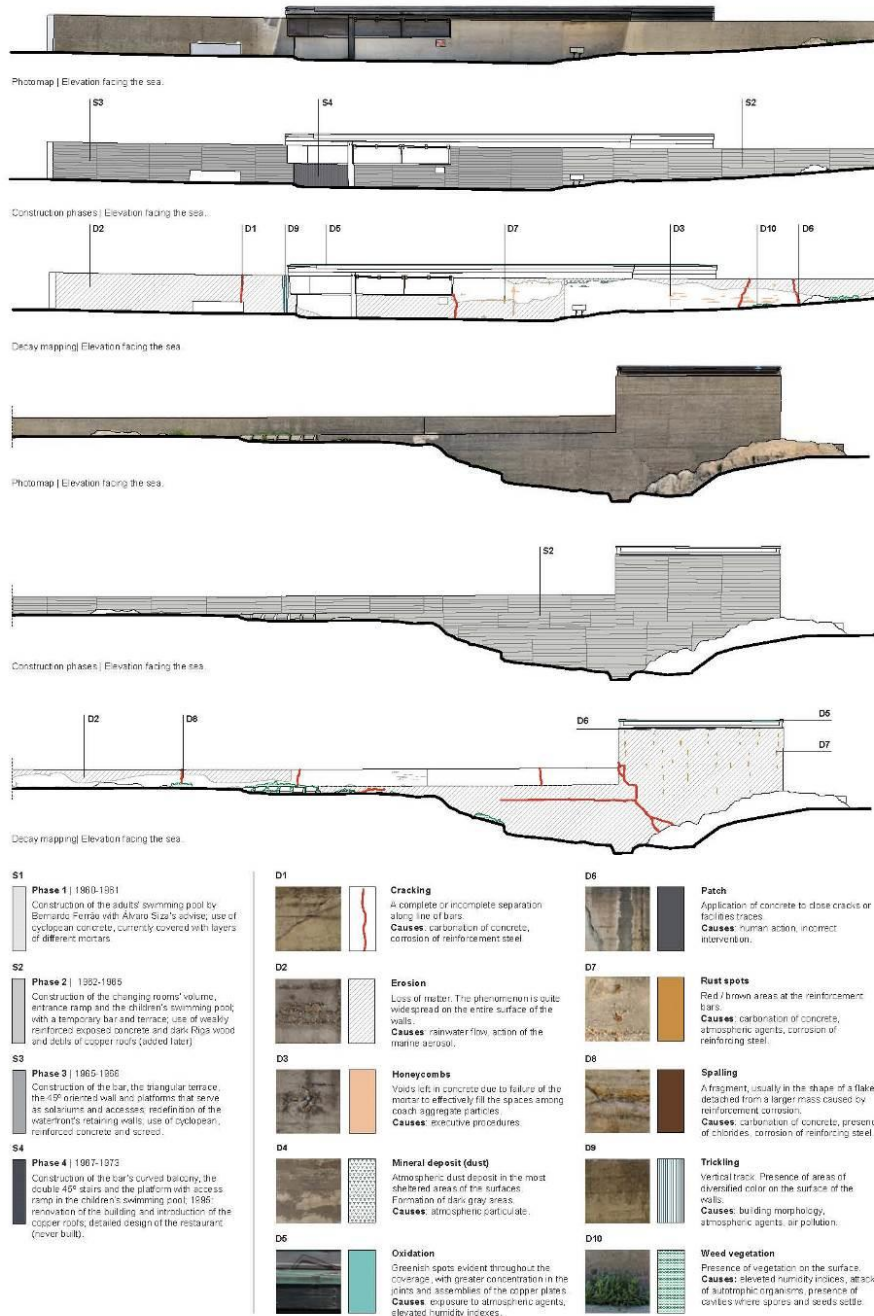


Fig. 3. Elevations of the Swimming Pool (Photomap, Phases and Decay Mapping) (source: Frederico Barbosa, Eleonora Fantini, Teresa Cunha Ferreira)



The intervention that is currently in progress comprises the following works: the replacement of the old pipes with new ones (made of copper) and the insertion of a new technical gallery for future maintenance; repair and repainting of the inner side of the adults' and children's swimming pool; demolition and reconstruction of the pavement of the bar and terrace, and the renovation of the toilets and sanitary appliances; treatment of all metal and wooden elements in the interior; demolition and reconstruction of the northern area of the building, under a new design<sup>23</sup>.

Unfortunately, the limited budget available for the works did not allow for the inspection, diagnosis and testing of the condition of the concrete. Also, in view of the visible patches of the remedial interventions conducted over time – which affect the building's authenticity and integrity as a whole – as well as the inevitable visibility of new repairs over existing cracks, Siza decided to perform a 'minimal intervention' involving the protective treatment and minor coating of the corroded reinforced steel elements, leaving the cracks uncovered as a memory of the history of the building.

However, this minimal intervention will require an accurate conservation management plan involving specific research on concrete, with annual monitoring and maintenance, possibly through the brush cleaning and protective painting of the uncovered cracks, as well as the treatment of the timber and the regular inspection of the roofs.

### **3.3. Preserving the signs of time**

These buildings are defined by the high quality of their construction and the building materials that were used (concrete, wood, copper), which have allowed for its conservation over the years. However, both buildings are in a vulnerable position because of their coastal location and the nearby oil refinery, which greatly aggravates the decay of concrete structures, by triggering the corrosion of the steel reinforcements. While the carbon dioxide from the refinery accelerates the occurrence of carbonisation, the chlorides of the salt water also penetrate the concrete and cause local corrosion and spalling. Furthermore, these buildings have suffered from the lack of preventive or planned conservation, which has also led to some reactive and incorrect repairs over time.

Hence, both works present the problem of concrete repair in a maritime environment, which, according to Siza, is one of the most challenging issues in the conservation of modern architecture, since localised repairs (which, in his opinion, are preferable to the complete replacement of existing concrete) are necessarily visible. He thus prefers to perform "minimum intervention, because it's not desirable (and it wouldn't be possible) to hide what is determined by the passage of time"<sup>24</sup>.

However, the previous condition of the concrete of these two works (before intervention) was quite different: while, in the Tea House, only very local

spalling or cracking of the concrete was detected, the Swimming Pool had a very high prominence of numerous anomalies in the concrete walls (Fig. 3). These diverse conditions led to different solutions for concrete repair: very localised intervention with a compatible cement coating in the Tea House (Fig. 4a), while, in the Swimming Pool, the architect decided to keep the signs of decay in order to avoid a visible 'patchwork' of concrete repairs in the walls (Fig. 4b). In the latter case, acknowledging the impossibility of dissimulating concrete repairs (due to the impracticality of reproducing the original conditions, as well as the binding and ageing processes) Siza thus preserved the 'signs of time' as part of the material history of the building.



Fig. 4. Concrete repair solution in the Tea House (2019) and Swimming Pool (2019, proposal) (photos by Frederico Barbosa)

#### 4. FINAL NOTE

This paper focuses on the challenging subject of the architect preserving his own work. Unlike other authors, who were either quite open or totally opposed to the intervention on their early works<sup>25</sup>, Alvaro Siza acknowledges the distance required from the original design and thus (albeit admitting the emotional conflicts) resists the temptation to perform corrections, upholding the importance of respecting the integrity and authenticity of the works. Being heavily committed to intervention in the built heritage in recent years (including several of his own works<sup>26</sup>), Siza maintains that in "conservation there is a mandatory requirement, which is (...) absolute integrity. No changes should be performed unless (...) in special or exceptional cases"<sup>27</sup>,

avoiding the tendency to leave the 'signature' of the architect on the intervention<sup>28</sup>.

Hence, in his recent interventions on the Tea House and Swimming Pools, Siza has respected the original project while he updated technical installations and service areas such as the toilets, kitchen and bar. However, the tectonic differences between the buildings (traditional constructive features in the Tea House versus flat roofs and long concrete walls in the Swimming Pool) led to different stages of deterioration (e.g. to the concrete, which was much more severe in the Pool) and, subsequently, to different approaches in the conservation intervention.

Moreover, both these buildings suffered from a lack of maintenance over a long period, which, according to Siza, is a decisive feature in the conservation of architectural works. In particular, modern buildings apply new industrialised technologies and materials – which are normally more vulnerable or age faster than pre-industrial constructions – so they require the implementation of accurate maintenance plans after intervention.

Although Siza recognises the “antique value”<sup>29</sup> in modern buildings, he calls for continued maintenance: “The passage of time in buildings is part of their quality; it increases the density of the buildings”, except when there is “a lowering, for economic reasons, of either the quality of the materials or the execution, or a lack of maintenance”<sup>30</sup>. Siza thus maintains that “the work of rehabilitation should be converted into maintenance. Otherwise you repair, and afterwards it decays again. Carrying out regular maintenance is a matter of economics”<sup>31</sup>.

In conclusion, these works by Siza provide us with important lessons, not only through their original design, but also through the recent conservation works based on respecting the building's integrity, together with a high-quality architectural design.

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## BIOGRAPHIES

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## NOTES

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<sup>2</sup> Sindicato Nacional dos Arquitectos, *1º Congresso Nacional de Arquitectura, Maio/Junho de 1948. Relatório da comissão executiva. Teses. Conclusões e Votos do Congresso*, Lisbon, Sindicato Nacional dos Arquitectos, 1948.

<sup>3</sup> Eduardo Fernandes, "Os CODA da EBAP nos anos 40: das linguagens do Estado Novo à emergência de uma consciência moderna", *A Conquista Social do Território. Arquitetura e Corporativismo no Estado Novo Português*, Fátima Ferreira, Francisco Mendes and Natália Pereira (eds.), Coimbra, Tenacitas, 2016, 39-56.

<sup>4</sup> These Surveys were carried out between 1955 and 1956, and resulted from the work of six groups (of three architects each) headed by Keil do Amaral (the main promoter of the project), Fernando Távora, Lixa Filgueiras, Nuno Teotónio Pereira, Frederico George and Artur Pires Martins.

<sup>5</sup> Keil do Amaral, Francisco (ed.), *Arquitetura Popular em Portugal*, Lisbon, SNA, 1961.

<sup>6</sup> Eduardo Fernandes, "The construction of the Porto School", Paulo Cruz, (ed.), *Structures and Architecture. Bridging the Gap and Crossing Borders*, London, CRC Press/Bakema, 2019, 293-4.

<sup>7</sup> Eduardo Fernandes, "From Seia to Guimarães. Fernando Távora's tectonic shift in the Sacor fuel stations", Paulo Cruz, ed, *Structures and Architecture. Beyond Their Limits*, London, CRC Press/Bakema, 2016, 403-4.

<sup>8</sup> In previous years, Siza had bought a few editions of *Architecture d'Aujourd'hui*, including an issue on Alvar Aalto's work. Looking at the Ocean Swimming Pool, one can see the

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influence of other designs, ranging from the parallel galleries from Frank Lloyd Wright's Taliesin West to Mies van der Rohe's architecture and, looking at the children's swimming pool, one can find echoes of a reinterpretation of Le Corbusier's free plan curves.

<sup>9</sup> Fernando Távora, Álvaro Siza, Eduardo Souto de Moura, Antonio Esposito, Giovanni Leoni, *Eduardo Souto Moura*, Barcelona, GG, 9.

<sup>10</sup> Eduardo Fernandes, "Reform Follows Function? Reflections on the Reuse of Modern Buildings", Ana Tostões and Zara Ferreira, (eds.), *DO.CO.MO.MO 14th International Conference. Adaptive Reuse. The Modern Movement Towards the Future*, Lisbon, DOCOMOMO/Casa da Arquitetura, 2016, 920-7.

<sup>11</sup> Christian Ganshirt, *Piscina na praia de Leça da Palmeira*, Lisbon, Blau, 2004, 10-20.

<sup>12</sup> Eduardo Fernandes, "A luz como material de construção: a Piscina das Marés em Leça da Palmeira (Álvaro Siza Vieira, 1961-66)", *International Conference on Communication and Light*, Braga, Instituto de Ciências Sociais da Universidade do Minho, 2015, 185.

<sup>13</sup> Álvaro Siza, "Piscina de Leça da Palmeira", C. C. Morais, (ed.), *01 textos: Álvaro Siza*, Porto, Civilização, 1980, 23.

<sup>14</sup> Eduardo Fernandes, "A luz como material de construção: a Piscina das Marés em Leça da Palmeira (Álvaro Siza Vieira, 1961-66)", *International Conference on Communication and Light*, Braga, Instituto de Ciências Sociais da Universidade do Minho, 2015, 187-8.

<sup>15</sup> Junichiro Tanizaki, *In Praise of Shadows* (In'ei Raison), New York, Random House 1933.

<sup>16</sup> Álvaro Siza, "Conferencia para el CAH2", *Intervention Approaches for the 20th-Century Architectural Heritage – International Conference CAH20th Madrid* (2011), p. 186.

<sup>17</sup> *Ibid.*, pp. 186-8.

<sup>18</sup> Álvaro Siza, Interview with Teresa Cunha Ferreira, 14 January 2018, unpub.

<sup>19</sup> The new concrete is a XS1 class, with 380 kg/m<sup>3</sup> of CEM I-32,5N cement and 50 kg/m<sup>3</sup> of fly ash in an A/L=0.34 proportion. Information kindly provided by GOP Engineering (Jorge Dias and Raquel Dias).

<sup>20</sup> Álvaro Siza, Interview with Teresa Cunha Ferreira, *Construção Magazine* 83, 2018, 7.

<sup>21</sup> This paper adopts the terminology used in Carolina Di Biase (a cura di), *Il degrado del calcestruzzo nell'architettura del Novecento*, Santarcangelo di Romagna, Maggioli, 2009.

<sup>22</sup> Christian Ganshirt, *Piscina na praia de Leça da Palmeira*, Lisbon, Blau, 2004, 33-4.

<sup>23</sup> In the case of the new walls to the north of the building, samples will be taken and tested on site, with the aim of drawing as close as possible to the original materiality, including the board marks of the formwork, in order to keep its texture similar to the original.

<sup>24</sup> Álvaro Siza, Interview with Teresa Cunha Ferreira, 14 January 2018, unpub.

<sup>25</sup> For example, while Le Corbusier admitted the transformation of his early works, Aldo van Eyck was largely opposed to any interventions on his works. See Fondation Le Corbusier, "Le Corbusier – L'oeuvre à l'épreuve de sa restauration", Paris: La Villette Eds, 2017; Wessel de Jonge, "Myth and metamorphosis: Aldo van Eyck's orphanage (1960) in Amsterdam restored", in *Proceedings of the 15th International Docomomo Conference – Metamorphosis: The Continuity of Change, IDC 2018*. Koselj, N. and Tostões, A. (eds.). Docomomo, 2018, p. 587-593.

<sup>26</sup> See Teresa Cunha Ferreira, "Conservation of 20th-century architecture in Portugal. The lesson of Álvaro Siza", in *Proceedings of the 15th International Docomomo Conference - Metamorphosis: The Continuity of Change, IDC 2018*. Koselj, N. and Tostões, A. (eds.). Docomomo, 2018, pp. 338-44,

<sup>27</sup> Álvaro Siza, "Conferencia para el CAH2", *Intervention Approaches for the 20th-Century Architectural Heritage*, International Conference CAH20th, Madrid, 2011, 188.

<sup>28</sup> Álvaro Siza, "Recuperação e Manutenção", *A intervenção no património. Práticas de conservação e reabilitação*, Porto, FEUP, 2005, 21.

<sup>29</sup> Alois Riegl, *The modern cult of monuments: its character and its origin*, Cambridge and London: MIT Press, 1982 (1903).

<sup>30</sup> Álvaro Siza, Interview with Teresa Cunha Ferreira, in Teresa Cunha Ferreira and Patrícia Rocha (eds.), *Saber manter os edifícios: pensar, desenhar, construir. Faculdade de*

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*Arquitectura da Universidade do Porto, Faculdade de Engenharia da Universidade do Porto, Porto, Afrontamento/ CEAU-FAUP/ CEES-FEUP, 2017, p. 151.*

<sup>31</sup> *Ibid.*, p. 141.