

Skin, Architecture and Sustainability: 3 Houses in the Alentejo - Architecture's Contribution to Cultural Sustainability

Fernando Hipólito and Helena Botelho

Universidade Lusíada/CITAD (Centro de Investigação em Território, Arquitetura e Design), Lisboa, Portugal

ABSTRACT

Sustainability is the topic of the moment. Most of the time, it's used wrongly or even just as easily consumed rhetoric. In the field of architectural research, and in the architect's work as an architectural professional who produces projects with the sole purpose of being realised/built, sustainability and its relevance require research in the field of "Project Thinking on Design" that speculates on other ways of acting and introduces alternative visions. Based on 3 case studies in Portugal, designed by 3 contemporary Portuguese architects, we propose, with this article, to study the relevance of the option of materiality, considered at the origin of the conceptual act and in the process of synthesis that is the architectural project and, with this, to legitimize the idea and open up space for architecture to be an integral part of the notion of culture as sustainability.

Keywords: Inhabiting, Sustainability, Houses, Alentejo, Rammed earth, Brick, Lime, Materiality

INTRODUCTION

This article is part of a research project entitled "Dwell: the houses", focusing on modern and contemporary architecture in Portugal. The research project is currently focusing on ways of living in a specific region of Portugal: Alentejo. The main objective will be to try to understand the importance of the specificity of a local and regional context, based on the way current architects produce contemporary architecture, as a result of reflection on the site, materiality and culture.

The research is in architectural design. An investigation carried out through the built work, the sole purpose of architecture, and in what the experience of using it can contribute to a deeper and more sensorial understanding of Man's existence in the world.

Sustainability has been used more as a technical methodology and rhetorical strategy for constructive solutions in the practice of architecture, directed towards the areas of technology and used, from the outset, as a founding premise and conditioner of the creative act in architecture. We believe that sustainability could be more than that. Due to its undoubted importance and topicality for the world and humanity, it could be a "weapon" at the

service of creativity to propose local, regional, contextual, and therefore sustainable solutions. We therefore propose a dual and simultaneous vision of sustainability: material sustainability and cultural sustainability.

The process of this research work includes the study of a total of nine houses in Alentejo, of which these three will be the pioneers. It is also intended as a document/book to be published in the future. These 3 houses have previously been used by their researchers as case studies, but with objectives only related to their importance and relevance from the spatial proposals, use of materiality and formal result. That study¹, entitled “Skin and architecture”, proved to be culturally operative on the one hand, but on the other, an indicator of the possibility of now adding to the same case studies, a vision more focused on an invisible sustainability, far from its foundational assumptions, but expressed in its built results. Material and cultural sustainability are proposed as a way forward for contemporary but local architecture.

ARCHITECTURE AS CULTURAL SUSTAINABILITY

This vision of sustainability is already defined by the European Commission as one of the five pillars of the European framework for action in the field of cultural heritage. In this way, environmental sustainability can be guaranteed, ensuring that culture and cultural heritage are at the root of inclusive and sustainable development.

It is with this in mind that the European Commission has created a project entitled “Creative Climate Leadership”, allowing professionals and cultural agents to apply their artistic techniques to problems related to the climate challenge.

If we consider that the professional practice of architecture is legitimized by the realization of projects, with the aim of building something on a territory, and that the design process is the result of creative thinking and exclusive reflection by an author/architect on a situation presented to him, we naturally understand that the architect will also have an important role as an agent of culture. In the same way, architecture will become an integral part of our cultural heritage.

This recent notion of culture understood from a sustainability-oriented perspective is highlighted by Ricardo Nogueira Martins and Flávio Nunes in a 2016 study by the University of Porto², in which they confirm the importance of *“recognizing local cultural values, equal rights and cultural logic within communities, in planning policies and decision-making (...); highlighting the role of art, creativity and cultural activities from the perspective of community vitality and their intersection in the planning of rural or urban spaces; appealing to a sense of place and local development; appealing to a sense of place and local development (...), understanding the territory as an entity;*

¹Research article presented by the two authors at the 5th International Seminar of the AEAULP (Association of Portuguese Language Schools of Architecture and Urbanism), held on 08/09 December 2023 in Brasilia.

²MARTINS, Ricardo Nogueira; NUNES, Flávio: *Cultural sustainability in the context of the European Union's sustainable development policies: the role of culture in the distinctions of the European green capital*, FLUP, Porto, 2016.

promoting a sustainable way of life based on ethical choices and the consumption of products and services in relation to the environment and other people; and favouring a bio-cultural approach.” Again, we find room for architecture to be an integral part of this notion of culture as sustainability.

HOUSE AS A PARADIGM OF ARCHITECTURE

Throughout the history of architecture, regardless of its size, social framework, authorship and geographical position in the world, the house has been an exercise that reveals the cultural dimension, functional necessity, territorial identification or, even, for a simple reason, so well contextualized by Heidegger: because Man has made this Earth his home, inhabiting it poetically. The house is a natural extension of human existence on Earth and of human existence within his own body.

The dual foundational importance of the concept of “Dwelling” and the concept of “House”, so well exemplified and pursued by modern and contemporary architects to this day, seems unquestionable.

ALENTEJO

Alentejo, the largest region in Portugal and the least densely populated. An area of the country that, due to its specific characteristics, has become the stage for unique and particular architectural experiences. Essentially, most of them, when designed by the architects, correspond to contextual responses to the specific characteristics of this territory, in their perception of it, in their spatial and typological responses and in the materiality implicit in the conceptual origin of the proposal.

The majority of Alentejo houses are orthogonal and rectangular in plan. Secure geometries, apparently mathematical, of evolving equations.

Houses that are resolved with a peculiar pragmatism, an operative rationalism combined with a tactile expression. Small rooms that follow one another and evolve according to need. Small, interconnected spaces, separated from the outside by thick walls made of stone masonry, rammed earth or adobe, depending on the geographical latitude within the region. The adaptation of the house to the topography is a constant and a natural characteristic of its suitability to the topographical circumstances of the sites where they are built. It is also important to mention the great differences in temperature in this region, both between the seasons and between night and day. Temperature differences are a constant.

Materiality

More than a formal choice, materiality in the three case studies is understood as skin (and building system), an organ that constitutes the human body and architecture itself, as an extension of it.

These three Portuguese houses, in the Alentejo, are built in three different materials, all traditional to this region of Portugal, and propose contemporary and distinctive ways of living, clearly rooted in local specificities.

Rammed earth is a material made from damp earth compacted inside a wooden formwork (taipal). It can be exposed or concealed, and when it is exposed, the image and the visual and physical temperature take on another dimension and visual and tactile exclusivity.

As a sustainable material, rammed earth has low energy consumption, low carbon emissions and low or almost zero levels of pollution. It contributes to humidity levels in interior spaces that are beneficial to human health.

Brick is generally used as an apparent structural element in arches, arches and vaults, confirming its genuineness and effort as a material, demonstrating protection and spatial security in its appearance. It was also used as a structural building system, most often covered in lime plaster.

Solid brick (in earth), as a sustainable material, has the same characteristics as rammed earth and contributes to high technical and acoustic performance.

Lime, the material used to clad walls structurally made of stone or rammed earth, is perhaps the most common material used as a skin in the Alentejo. It is a living material, technically known as “quick lime”, made up of limestone in a liquid state (stone and water) and has been used as a coating paint or mortar for a long time. Lime and its ritualized application “reflect the calm of Alentejo culture”, according to locals.

Lime, as a sustainable material, is characterized by reduced water penetration, greater breathability and humidity control, as well as a significant increase in adhesion and a reduction in cracking. It is also easy and inexpensive to maintain, reducing the carbon footprint and complying with sustainable construction criteria.

Rammed earth, brick, and lime, both structural and cladding materials and construction systems, naturally applied to opaque walls, are regional references to the vernacular tradition of Alentejo architecture.

The great contribution of these 3 houses is a new approach to traditional building systems. And this is precisely where their contemporaneity and originality can be found: they are 3 different skins, colored and not white (as is traditional in the Alentejo) that “customize” architecture, revealing spatial proposals that reflect and exude an Alentejo “dwelling”, attentive to local realities.

Architects who are authors are professionals who gather conceptual material from the world and from their experience and interpretation of that world, through their sensitivity and particular eye, building a database to realize their projects, consolidate and implement their ideas, build their conceptual platforms where they can exercise their authorship, express it and contribute to the exclusivity of those same ideas.

The architects/authors build on references, history, tradition, the pieces of their observation of these contexts, in an ever-vaguer attitude of a “painter’s gaze” and investigator’s view of the world. An attitude of someone who “distrusts” to be able to act, an exclusive and unique conceptual universe, which concentrates and brings together a creative and manipulative dimension, capable of interacting with the sensibility of those who use the spaces, meet the skin of the architecture, and live the idea of its creator.

These 3 architects and their 3 houses in Alentejo represent this capacity and power to mediate between a culture, materiality, tactile experiences, and time, in a specific territory in Portugal.

And, in this sense, they also apply their “artistic” techniques, which are exclusive to their practical professional work, but which are also technical, to problems related to the climate challenge.

THREE CASE STUDIES



Taipa house, courtesy of Atelier Bartolomeu Costa Cabral

RAMMED EARTH HOUSE, Bartolomeu Costa Cabral

MATERIAL: Rammed earth

DATE: 2004–2008

LOCATION: Quintos, Beja, Portugal

“The site, the rammed earth construction and the program are the roots of the design of this house, whose program was defined in response to the needs and desires of the family, materialized from the outset in a list of “wishes”, not only functional but also of the environment of the house itself. Throughout the design and construction process, the house benefited from the close collaboration of the owners, a couple of artists, she a ceramicist and he a sculptor and painter. The choice of rammed earth construction was evident due to the climatic aspects, the defence of the Alentejo heat, creating an environment with thermal inertia, and also because it was a traditional technique suitable for a building with only one floor. The beauty of the site and its isolation, as the house is located within a large estate, were strong stimuli for defining the project, which is a response to the surrounding nature.”³

³In “Bartolomeu Costa Cabral 18 Obras”/ed. Paulo Providência, Pedro Baía. - Porto: Circo de Ideias, 2019 (2nd ed.).

Materiality

The house uses rammed earth made from the earth and shale of the site, supported by a reinforced concrete structure. On the outside, the rammed earth is coated with an orange/yellowish plaster and on the inside with a grayish sand-colored mortar, both made with sand from the site. The ceilings are made of exposed concrete, sometimes interspersed with pine wood beams (rooms). In the block corresponding to the workshops, the structure and the rammed earth are left exposed, as is the wall/plane where the water tank leans, dematerializing the volumetric weight of the workshops, a metaphor for agricultural warehouses. The pine wood exposed in the interior planes allows the comfort of a domestic environment to be amplified.

Result

The synthesis of materiality is what gives the house its body temperature. The rammed earth, sometimes coated, sometimes exposed, the concrete (ceilings) and the honed screed (floors) and the overlapping pine wood, impure in its apparent “knots”, envelop our bodies. Traditional Alentejo rammed earth is used here both as a sustainable construction system, hidden by the mortar coatings, and as a tactile and apparent material.



Photo by João Guimarães, House in Melides I, courtesy Atelier Aires Mateus

BRICK HOUSE, Manuel and Francisco Aires Mateus

MATERIAL: Earth, brick

DATE: 2010–2016

LOCATION: Melides, Grândola, Portugal

“A single material, the handmade brick, in continuity with the earth, designs the house. A local material relates the house to the landscape. A material that designs the succession of spaces to be occupied with different experiences. The experience of living surrounds the interior spaces, where the program of the house and its supports are developed, and the exterior spaces, a succession of gardens, designed by experiences, colors, smells and use.”⁴

Materiality

Built entirely from solid clay bricks made in the Alentejo (São Pedro do Corval), the house materializes from the earth itself, transformed and shaped into geometric brick blocks that are repeatedly configured and demultiplied, resulting in the house itself. The interior wooden ceilings and the exterior ceilings, absent and open, configured by the sky and the surrounding tree-tops, propose an intimate relationship with the materiality and the specific site where the house exists.

Result

Brick, a material used in traditional Alentejo construction as a self-supporting building system, but always coated with regularly overlapping lime mortar in white, is in this case transformed into the material that will give this house, in the essence and sincerity of its exposure, the truth of its image. A traditional structure now stripped bare but enveloping our bodies.



Photo by Francisco Nogueira, Casa Azul, courtesy Atelier Bak Gordon

⁴in Project description, courtesy of Atelier Aires Mateus e Associados

LIME HOUSE, Ricardo Bak Gordon

MATERIAL: Lime mortar

DATE: 2016–2021

LOCATION: Monte dos Patos, Grândola, Portugal

“Built in the vast Alentejo territory, the house emerges from the figure of an extensive tank attached to a wall, facing south, as if it were a sounding board for the entire landscape. On the other side of the wall are the house’s social spaces and two fresco rooms, places of transition between interior and exterior, foundational to this daily life. The different private spaces gravitate around a small inner courtyard.”⁵

Materiality

Yellowish pink lime, the color of the land, covers all the interior and exterior surfaces of the house (floors, walls, ceilings), with the exception of part of the Alentejo marble wall, between openings, on the front façade, like a palatial wainscot. Also noteworthy are the window frames, whose “sliding” system of operation into the walls promotes this absence of the design and presence of the “window”, emphasizing the importance of the “gap” as a material removed from the skin.

Result

It is the materiality that gives the house its inner and outer skin and envelops the body of those who inhabit it. The lime plaster, usually white in the Alentejo, uses earth tones here, “dressing” our body and incorporating it into the house itself. House and body are one. The traditional Alentejo lime mortar is used here with colour, contaminating all the surrounding surfaces.

SKIN, ARCHITECTURE, AND SUSTAINABLE CONSTRUCTION

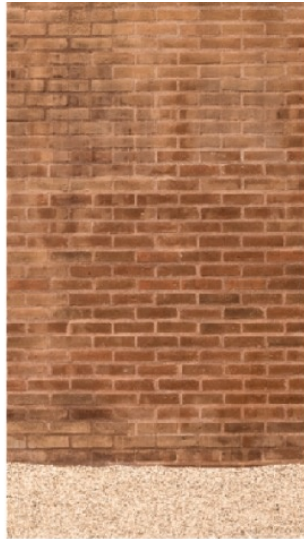
Built in three different materials (lime, brick, and rammed earth), we find in these three houses sustainable solutions for a contemporary way of designing a house in a regional context. These three houses share several common principles when it comes to this subject:

- The concern to work with local materials from the region.
- The desire for this condition to link them more closely to their territory and the landscape in which they are located, a very Portuguese way of thinking about architecture, with the construction of qualified and integrated places, in total harmony with the surrounding space.
- The recovery of traditional building techniques, adapting them to the demands of contemporary construction.

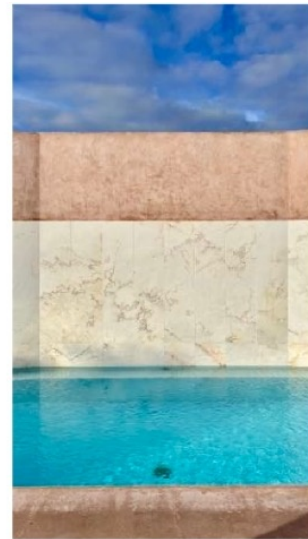
⁵in Project description, courtesy of Atelier Bak Gordon.



Photographs by the authors, rammed earth



Photographs by the authors, brick



Photographs by the authors, lime

CONCLUSION

Based on the importance of the architectural experience, as legitimization of the understanding of the architectural project mirrored in real works, we assume the importance that our senses acquire with the architectural phenomenon. The thickness of the skin, in Portugal, dethroned the modern idea of glass, thus emphasizing the importance of matter. This study proposes to reference and legitimize the presence of three “coloured” skins in contemporary Portuguese architecture in the Alentejo. These skins build physical and social relationship mechanisms, as an organ that separates, establishes borders, and builds barriers.

The rammed earth is a construction system that is both apparent and hidden (Costa Cabral); brick, an apparent construction system (Aires Mateus); lime, a global coating system that combines textures and reflections (Bak Gordon).

These are three houses from the Alentejo that articulate with their sites, opposing the white tradition, because they are colorful and fused with the territories that surround them. In this sense, they constitute a more conceptual approach to contextual legitimization, rather than simply an obvious and easily revealed approach. And they introduce this new paradigm: the materiality revealed in the constitution of the “skin” of architecture, an original and transitional fact in architectural performance in Portugal, which could start a new cycle of turning points in the activity of designing architecture in non-urban contexts.

Built in three materials (lime, brick, and rammed earth) that originate three different skins, trying to find in these differences, sustainable solutions to a contemporary way of designing houses in regional context.

ACKNOWLEDGMENT

This work was supported by FCT - Fundação para a Ciência e Tecnologia, I.P. by project reference <UIDP/04026/2020> and DOI identifier <10.54499/UIDP/04026/2020 (<https://doi.org/10.54499/UIDP/04026/2020>)>.”

REFERENCES

- Bachelard, Gaston: *The Poetics of Space*, ed. Beacon Press, Boston, 1969.
- Colomina, Beatriz: *Arquitectura de rayos X*, ed. Puente Editores, Barcelona, 2021.
- Gordon, Bak: *Bak Gordon*, ed. A+A Books, Lisboa, 2021.
- Gordon, Bak: *Descriptive Memory of Casa Azul*, document kindly provided by the architect to the authors of this article, 2016.
- Magazine “TC 145 Cuadernos”: *Aires Mateus. Arquitectura 2003–2020*, ed. General de Ediciones de Arquitectura, SL, Valencia, 2020.
- Mateus, Manuel Aires: *Descriptive Memory of Brick House*, document kindly provided by the architect to the authors of this article, 2010.
- Pallasmaa, Juhani: *Essências*, ed. Gustavo Gili, Barcelona, 2018.
- Providência, Paulo: *Bartolomeu Costa Cabral: 18 obras*, ed. Circo de Ideias, Porto, 2016.