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ATHENS INSTITUTE FOR EDUCATION AND RESEARCH
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Mission

ATINER is a *World Non-Profit Association* of Academics and Researchers based in Athens. ATINER is an independent **Association** with a **Mission** to become a forum where Academics and Researchers from all over the world can meet in Athens, exchange ideas on their research and discuss future developments in their disciplines, **as well as engage with professionals from other fields**. Athens was chosen because of its long history of academic gatherings, which go back thousands of years to *Plato's Academy* and *Aristotle's Lyceum*. Both these historic places are within walking distance from ATINER's downtown offices. Since antiquity, Athens was an open city. In the words of Pericles, **Athens"...*is open to the world, we never expel a foreigner from learning or seeing". (**"Pericles' Funeral Oration", in Thucydides, *The History of the Peloponnesian War). It is ATINER's **mission** to revive the glory of Ancient Athens by inviting the World Academic Community to the city, to learn from each other in an environment of freedom and respect for other people's opinions and beliefs. After all, the free expression of one's opinion formed the basis for the development of democracy, and Athens was its cradle. As it turned out, the Golden Age of Athens was in fact, the Golden Age of the Western Civilization. *Education* and *(Re)searching* for the 'truth' are the pillars of any free (democratic) society. This is the reason why Education and *Research* are the two core words in ATINER's name.

Athens Journal of Architecture
Editorial and Reviewers' Board

President's Message

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Before you submit, please make sure your paper meets some basic academic standards, which include proper English. Some articles will be selected from the numerous papers that have been presented at the various annual international academic conferences organized by the different divisions and units of the Athens Institute for Education and Research.

The plethora of papers presented every year will enable the editorial board of each journal to select the best ones, and in so doing, to produce a quality academic journal. In addition to papers presented, ATINER encourages the independent submission of papers to be evaluated for publication.

The current issue of the Athens Journal of Architecture (AJA) is the fourth issue of the fifth volume (2019). The reader will notice some changes compared with the previous issues, which I hope is an improvement.

Gregory T. Papanikos, President
Athens Institute for Education and Research

Athens Institute for Education and Research
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10th Annual International Conference on Architecture
6-9 July 2020, Athens, Greece

The [Architecture Unit](#) of ATINER, will hold its **10th Annual International Conference on Architecture, 6-9 July 2020, Athens, Greece** sponsored by the [Athens Journal of Architecture](#). The aim of the conference is to bring together academics and researchers from all areas of Architecture. You may participate as stream organizer, presenter of one paper, chair a session or observer. Please submit a proposal using the form available (https://www.atiner.gr/2020/FORM-ARC.doc).

Academic Member Responsible for the Conference

- **Dr. Nicholas N. Patricios,** Vice President of Strategic Planning & Analysis, ATINER and Professor & Dean Emeritus, School of Architecture, University of Miami, USA.

Important Dates

- Abstract Submission: **2 December 2019**
- Acceptance of Abstract: 4 Weeks after Submission
- Submission of Paper: **8 June 2020**

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The Social Program Emphasizes the Educational Aspect of the Academic Meetings of Atiner.

- Greek Night Entertainment (This is the official dinner of the conference)
- Athens Sightseeing: Old and New-An Educational Urban Walk
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Conference Fees

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Athens Institute for Education and Research
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10th Annual International Conference on Urban Studies & Planning, 1-4 June 2020, Athens, Greece

The Architecture Unit in collaboration with the Social Sciences Division of the ATINER will organize its **10th Annual International Conference on Urban Studies & Planning, 1-4 June 2020, Athens, Greece** sponsored by the Athens Journal of Architecture. The aim of the conference is to bring together academics and researchers from all areas of social sciences such as urban sociology, urban geography, urban design, urban planning, architecture, etc. You may participate as stream leader, presenter of one paper, chair of a session or observer. Please submit a proposal using the form available (https://www.atiner.gr/2020/FORM-PLA.doc).

Important Dates
- Abstract Submission: **20 October 2019**
- Acceptance of Abstract: 4 Weeks after Submission
- Submission of Paper: **4 May 2020**

Academic Members Responsible for the Conference
- **Dr. Nicholas N. Patricios,** Vice President of Strategic Planning & Analysis, ATINER and Professor & Dean Emeritus, School of Architecture, University of Miami, USA.
- **Dr. Virginia Sisiopiku**, Head, Transportation Engineering Unit, ATINER, & Associate Professor, The University of Alabama at Birmingham, USA.
- **Dr. Jesus J. Lara**, Academic Member, ATINER & Associate Professor, The Ohio State University, USA.

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The Design of Spaces for Young Children and Preschool in Emergency

By Nicoletta Sorrentino[*]

The paper aims to show how to develop and treat spaces devoted to childhood and the restarting of teaching activities after disasters, in situations of emergencies, particularly reflecting the needs of early childhood age. This choice is motivated by the fact that this early stage of age requires diverse and adequate devices, especially for what concerns the constitution of the environment where they live and experience extraordinary conditions. The essay will present, through quantitative evaluation of the impact of disasters on minors, the significance and the consequences of traumatic events on children, as expressed in their way of behaving and reacting both personally and within the relation with the community. The research methodology, progressing from a general presentation of the psychological facets and focusing on the dynamics of relationships with adults and other children, follows the narrative of the features of the correct preschool environment. As a result, the research depicts the peculiarities of proper strategies for mitigation and intervention in the occurrence of disasters, as how expressed by NGOs. Furthermore, the essays tend to become more technical, examining the state of the art and indicating good practices of design for childhood purposes and preschools; on the other hand, less addressed designs, actually widely used will be compared. In the end, the paper will show some concept designs, applicable to different contexts and landscapes, on the Italian territory, that for their inner peculiarities could be used as early age children school. On the basis of what will be presented in the research, a design process has been constituted for achieving valuable answers, coherent with the theme under examination, also applicable once stopped the emergence and in extraordinary conditions. The attention focuses on the interior and furniture design and its setting, that in most cases are not enough cared, while for the external housing structures the concepts offer different solutions, also considering products already part of the mass production.

Introduction

This research began in 2012 and was the subject of the author's graduate studies for the Architecture Degree at the University of Genoa, under the guidance of Prof. Carlo Vannicola and Dr Luisa Chimenz.

The initial idea was born on one hand by some observations on the current historical phase and will be explained below. According to the reports and the latest information of Save the Children and other agencies among the most reliable non-governmental organizations (NGOs), a significant number of children every day, are forced to deal with the effects of natural disasters or armed conflict. So, they lose the opportunity to attend school, educate and socialize with peers, and are at risk of ill-treatment and abuse. Moreover, between 2009 and 2012 they took place in Italy several natural disasters (earthquakes and floods). Among the several

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consequences of these events, there was the suspension of school activities for children of the affected areas, as school buildings were condemned or at worst, destroyed.

Thus, faced with this situation, a simple question occurred. How can architecture and design do their part and meet the challenges that these conditions present to us, if they can do it? Observing the means of intervention most widely implemented in these circumstances, emerged some critical aspects that are not addressed, probably because they are not perceived as a priority yet. Furthermore, examining the current responses in terms of structures and equipment, very critical issues have been highlighted.

Then, what is the contribution that architects and designers can give, by virtue of their skills? How could they improve the solutions put in place, so that they are more responsive to the needs of children, not only from the functional point of view but also alleviating the difficulties in such critical moments, providing welcoming, attractive and safe environments?

The paper aims to describe the main stages of the research originated with these questions, clearly showing the logical path followed from the identification of the problems to the solutions proposed, taking into account the various factors at play.

The main new feature of this research lies in its multidisciplinary, in the effort to outline an experimental approach to design, with the intention to show how to develop and treat spaces devoted to childhood and to the restarting of teaching activities after disasters.

Methodology

The research methodology starts from a general presentation of the psychological facets and the dynamics of relationships with adults and other children and then is progressing with the narrative of the features of the correct preschool environment.

Through a brief quantitative evaluation of the impact of disasters on minors, they have been presented the significance of traumatic events and the way the children react to their consequences, both personally, and within relation with the community.

As a result, they have been depicted the peculiarities of proper strategies for intervention in the occurrence of disasters. According to NGOs' indication, it is analysed the state of the art, in a comparison between the good practices of design for childhood purposes and preschools, and less addressed but actually, widely used solutions.

Finally, the paper outlines the design process built on these considerations and shows some concept designs, applicable to different contexts and landscapes of the Italian territory and inner peculiarities could be used as a school for children of an early age.

Children between the Age of 3 and 6

Above all, it has been considered that, before examining the reactions of children to disasters, it should be convenient to know their behaviour in normal conditions.

At this early stage of age, children grow up facing many changes, so it is very important for them to have the references by which to understand reality.

In this process of building knowledge, a few elements are of particular importance for the final purpose of this research, presented as follows.

Routines are essential socio-cognitive and emotional anchors, as they help the child to deal with ambiguous aspects and unexpected problems or conflicts, in the course of daily life.

Being part of a social group gives children a usual basis for sharing moments and experiences with each other and contributes to building a sense of belonging to a community.

New things are often perceived as a source of fear at first, so children have to be helped to transform back into a normal atmosphere what at first is unfamiliar.

Peer relationships and *friendships* are kinds of bonding that bring to the creation of a commonly shared world. They are also a powerful force to overcome the negative emotions, by virtue of which children develop solidarity and empathy.

Playing is the main activity of children, whereby they extend their experience of the surrounding reality and deepen their empirical knowledge. Playing is also a cathartic experience, by means of which children can re-balance their emotions. Finally, while they play through the simulation, children train themselves to be sons, parents, teachers, doctors and so on, and they make own roles and rules.

The *peer culture* is the element that allows children to not feel alone in acquiring and interpreting the adult world. It is a stable set of activities or routines, objects, values and concerns that children produce and share in interaction with each other. It is highly symbolic and has its origin in the usual interests of children (fairy tales, cartoons, toys) and represents their attempt to make sense of things. Another central aspect of the interaction between peers is to challenge the authority of adults. Sharing the prohibited behaviour with peers means mainly to give a common significance to the violated rule. In the peer culture, finally, they are incorporated also real fears, identifying strategies to address them and process them through the control in the game routines and rituals.

Main Features of Preschools

In the same way, as done examining the behaviour of children, the choice has been to consider the main features of preschools in normal conditions, before studying the emergency context.

The kindergarten is the place where children often experience the first contacts with peers and where they establish new educational relations with adults other than parents. Preschool becomes a physical and temporal space called "educational environment", that is intended to lead boys and girls, each in their own time, to the improvement of their identity, autonomy, competence and sense

of participation and citizenship. "If the environment contributes to the growth and education of the child, it is inevitable to wonder about its nature; if you take pleasure entering in it (adults and children), and if you experience satisfaction being there every day.

If this is the feeling you have, it can deduce that it is a nice, pleasant, friendly, a *facilitating environment* that supports the child in the fundamental tasks of his growth: attainment, building personal strategies of exploration, knowledge, experience and appropriation."[1]

As school at first could not be perceived positively and so it could not be accepted, it is particularly important the scan of various time steps, in order to enhance the organizing function of children's thinking. Thus, the establishment of new routines will help the child becoming familiar with the new environment and to accept it, during the separation from parents. "The routines, then, run the time of life at school" and "[…] return the child to a sense of continuity and stability in change,"[2] becoming symbolic representation not only of the individual but of the identity of the whole group. Finally, the physical characteristics of the school environment which is one of the most relevant aspects from the point of view of architecture and design, and of main importance in the development of this research. It can, in turn, affect the climate of the educational environment, facilitating or hindering learning. In this sense, it is relevant to this issue the *Reggio Emilia Approach*, "an educational philosophy based on the image of the child, and of human beings, as possessing strong potentials for development and as a subject of rights who learns and grows in the relationships with others,"[3] as written on the website of *Reggio Children* organisation. In this unique, educational vision, the setting of school spaces takes on a special significance. In fact, all properties of the school environment are considered important in connote, positively or negatively, the quality of life that takes place in them, so their performance must be studied very carefully. According to Rosanna Bosi, "Space is a fundamental educational vehicle. It is never a *neutral* container, and it has its own specific language,"[4] so its material design is a decisive step in the educational action, having its goal as the creation of an environment at the same time stimulating and reassuring.

Children and the Emergency

In the research phase, it was particularly difficult to raise disaggregated statistical data, explicitly referred to the involvement of children in crisis situations.

However, this does not prevent to outline a picture of the extent of the situation, both globally that in the narrower field of the Italian territory.

In fact, it is sufficient to refer to the main humanitarian agencies, to get an idea of how many children must deal daily with the consequences of natural disasters or conflicts, and socio-political instability.

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1. R. Bosi, *La Cura Nella Scuola dell' Infanzia* (Rome: Carocci, 2007), 72.
2. Ibid, 87.
3. Refer to http://www.reggiochildren.it/identita/reggio-emilia-approach/?lang=en.
4. Bosi, *La Cura Nella Scuola dell' Infanzia*, 2007, 77.

"Natural disasters and armed conflict have marked human existence throughout history and have always caused peaks in mortality and morbidity. But in recent times, the scale and scope of these events have increased markedly. Since 1990, natural disasters have affected about 217 million people every year, and about 300 million people now live amidst violent insecurity around the world."[5]

Referring to the current situation, and to the most up-to-date data related to the very latest events, for example, we find that in Haiti up to 130,000 children were estimated to be out of school following the Hurricane Matthew (2016).[6]

In Syria, six years since the war began, 5.8 million children still live under shelling and 3 million of them, who are now six years old, have never known anything but war.[7]

Finally, remarking the Italian case, the seismic crisis occurred between August and October 2016 hit more than 30,000 people living in a complex territorial situation and settlement.[8] These examples certainly cannot be considered exhaustive, however, they depict significantly the general framework, highlighting how the problem of emergencies is globally spread.

Definition of "Traumatic Event" and Consequences Concerning Individuals and Community

The word *trauma* usually indicates an "emotional shock following a stressful event or a physical injury, which may lead to long-term neurosis."[9]

"A traumatic event or situation creates psychological trauma when it overwhelms the individual's ability to cope, and leaves that person fearing death, annihilation, mutilation, or psychosis. The individual may feel emotionally, cognitively, and physically overwhelmed."[10]

Broadly speaking, the trauma can be identified in an experience of particular gravity, such as to impair the sense of stability and continuity of physical or mental health of a person.

Disasters can be considered as traumatic events, for their power to exceed the human experience and to induce stress reactions in anyone. People who are facing the consequences of any type of disaster live a sudden and disruptive fragmentation of their existential continuity, which can put a strain on their capacity to adapt their psychological health.

This could be even more difficult for children, who have still immature ability to cope with the difficulties. The perception of danger often causes fear, a sense of helplessness, in front of death and destruction. Confusion and disorder are manifested in increased vulnerability.

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5. See J. Leaning and G. S. Debarati, "Natural Disasters, Armed Conflict, and Public Health," *New England Journal of Medicine* 369, no. 19 (2013): 1836.

6. Source Save the Children International. See https://bit.ly/2tCMY0L.

7. Source Save the Children Italy. See https://bit.ly/2mro7I0.

8. Extrapolated Data from a Custom Research in EM-DAT Database. See https://bit.ly/2UaDLbE.

9. Definition from the Online Version of Oxford Dictionaries (retriev.) https://bit.ly/2SnmA5h. [Accessed 03/05/2017].

10. See E. Giller, *What is Psychological Trauma* (Brooklandville, MD: Sidran Institute, 1999).

This mix of counter emotions is frequently difficult to manage and could add a dangerous sense of distrust of adults, if the facts have been deliberately caused by humans, such as war or terrorist attacks.

Even if children could not find themselves to personally experience the extreme consequences of the calamity, the impact of disasters on their daily life generates immediate instability and uncertainty. They may have to suddenly adapt to makeshift accommodations, or it might not be possible to go to school, to play sports and to meet with friends.

The results could be a strong break between *before* and *after* in the lives of involved children, in their established routines, and a new daily life may have to be built overnight, in extreme cases without the prospect of a return to previous normality.

It is evident that the response of the child is influenced by the one of the adults: as much as they demonstrate grasp of the situation and control, the material and emotional adaptation of children increases.

"Among the survivors of a disaster, the vast majority of people [...] shows signs of stress, so that stress reactions are considered a *normal reaction to abnormal events.*"[11]

The individual response depends on many different factors, starting from the type of experience and its severity. For children, they mainly rely on aspects such as proximity to the place and awareness of the disaster (evidently related to the age), having been injured or in mortal danger (real or perceived), or have even lost family and friends. Something to be considered too, is the loss of material goods, the intensity and duration of the disruption of his life and the reactions of those around them. It is possible to observe several typical consequences in children:

- the increased dependence on adults;
- the occurrence of nightmares and other sleep disorders;
- the regression in the development of evolutionary stages;
- the outbreak of specific fears in relation to objects that evoke the experience;
- the repetitive representation of the disaster in post-traumatic play.[12]

The traumatic impact of the event generates a response not only at the individual level, but also a community reaction. The two things are tangled and affect each other.

In fact, the relationship between the individuals and their own communities will change significantly during the post-emergence phases. Initially, there are stronger links within civil society, with a big boost to solidarity and to mutual aid. Later, the situation can consolidate, especially in the long term. This may cause the opposite effect, leading to the creation of groups and subgroups with consequent conflicts for receiving aid and housing. These dynamics negatively influence the sense of community and can be hardly recovered once the

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11. G. Lo Iacono and L. Ranzato, "Aiutare i Bambini Sopravvissuti a Calamità: Indicazioni per Insegnanti e Genitori," *Psicologia e Psicologi* I, no. 3 (2001): 2.

12. Ibid, 5.

emergency has stopped.

Child-Friendly Spaces as a Paradigm of Response

The Child-Friendly Spaces (CFS) are intervention instruments provided by various humanitarian organizations, as a response in the short- and medium-term to the effects of a crisis.

"The purpose of CFSs is to support the resilience and well-being of children and young people through community organized, structured activities conducted in a safe, child-friendly, and stimulating environment."[13]

They are often arranged in tents or other provisional structures, in the aim to offer a child centred environment. They include the possibility of tailor-made play areas for different ages, education, health and psycho-social support services.

As expressed by the Global Protection Cluster in cooperation with Global Education Cluster, INEE and IASC, "A coordinated, inter-agency, and multi-sectorial approach to CFSs is needed to address the needs of the affected population and achieve program consistency, quality, and sustainability,"[14] in the aim to ensure the effective functioning of this kind of measures.

Thus, in establishing CFSs it is of paramount importance operating appropriately to the contexts and the culture. It should take a coordinated, inter-agency and multi-sectorial approach. CFSs should be used as a means of mobilizing the community and be the most inclusive and non-discriminatory; to ensure security and safety; to be stimulating, participatory and supportive environments.[15]

The Children's Behaviour and the School's Role

Belonging to a group or community, as well as the dynamics within them, influence the experience of the individual already in normal conditions. In the occurrence of extraordinary situations, it is of even greater importance for children.

Thus, it emerged that school can play a positive role at several levels, with beneficial effects both on the individuals and on the whole community. They can be grouped into three categories, as follows.

Physical Aspects

School provides safe spaces where play and spend time with friends. The school environment is an easily recognisable place that can be uniquely identified by the youngest, helping them to establish a new benchmark in the construction of everyday life in the camp.

The spatial arrangement and the organization of the activities can significantly

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13. See Global Protection Cluster. *Guidelines for Child Friendly Spaces in Emergencies* (Global Education Cluster, INEE & IASC, 2011), 2.
14. Ibid, 4.
15. Ibid, 3.

contribute to adaptation to the new situation, recalling and re-enacting well-known dynamics.

Psychological Aspects

The creation of special conditions and attitudes in respect of affected children can lead to re-establish their confidence and security.

Children may share with peers their impressions about the new situation and so find reassurance from the bottom up, resulting in a positive effect of brightening.

Also, thanks to its physical features, the school can support the restoration of control and predictability of the events, a requirement of main importance for children.

Social Aspects

The school has a role of primary importance, at a double level: through the involvement of individuals, it leads to benefit the whole community.

In the extremely informal emergency context, some prejudices can lapse, so who had been hitherto excluded from the group could start to join it.

As the group is such a significant element of socialization, hold together the existing classes, as far as possible, is a factor that should not be underestimated.

They contribute to the consolidation of the routine not only time and place where the group meets, but the same people who belong to it and share them together.

Furthermore, through education, it is possible for a community to keep its identity and the maintenance and development of the mother tongue. Addressing identity dispersion generated by the logic of "non-place", and promoting an attitude of resistance, keeps the bond of the community with its own history.[16]

According to Maria Vittoria Isidori and Alessandro Vaccarelli, it is so highlighted that "Especially in chronic situations, provide education allows a population of not lowering the standards achieved and to work on an idea of future projects, involving at the same time individuality and sense of community."[17] Moreover, as stated by Vanna Iori, "In moments of crisis, […] the essential task of educational institutions is to restore the temporal coordinates, within which unravels the existence of a person, renovating the symbolic, intrapsychic space and relational, which makes everyday life, in order to reconstruct and reinterpret the previous life experience and the current one."[18]

In conclusion, not including the family, school is the only institution capable

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16. For a more complete discussion on this topic, refer to M. V. Isidori, "Principali Criticità della Pedagogia e della Didattica dell' Emergenza," *Studi sulla Formazione* 13, no. 1 (2010): 159-160.

17. See M. V. Isidori and A. Vaccarelli, *Pedagogia dell' Emergenza/Didattica nell' Emergenza. I Processi Formativi nelle Situazioni di Criticità Individuali e Collettive* (Milan: Franco Angeli, 2013), 155.

18. V. Iori, *Lo Spazio Vissuto: Luoghi Educative e Soggettività* (Florence: Nuova Italia, 1996), quote in Isidori, "Principali Criticità della Pedagogia e della Didattica dell' Emergenza," 135.

of restoring a frame that literally "bracket" the life of children, making easier for them to deal with the consequences of disasters and emergency situations.

Design for Emergency School Architecture

Regarding the strategies of intervention from a more technical point of view, the research had examined the state of the art, depicting a general overview of the situation.

On one hand, they arise some models that could be considered as best practices, even if sometimes they were not initially designed for this purpose.

On the other, they have been described as cases not free from problematic issues, as they however, represent the most widely used solutions.

From a first schematic analysis, it appears that in most cases the recovery of school activities is initially implemented in tents, equipped with retrieved or makeshift minimal supplies. After, it transfers to temporary structures, half the time comparable to containers. They certainly offer greater comfort than the tents, but however present considerable critical aspects.

Broadly speaking, the issue seems to be focusing more on the outer shell, however with little consideration of what and how that case will contain. As a result, many times the arrangements appear inappropriate and seem almost left to chance and even more boosting the state of insecurity. The research gives a brief review of projects, organized into two sections, *Architecture* and *Partitions and furniture*. They include mobile units and self-construction architectures, as well as ordinary furniture and temporary solutions. Due to space constraints, not all projects originally examined can be here included, so they will be presented two models for section, and compared both "good practice vs improvable model".

Architecture: Hualin Temporary School vs M.U.S.P. Project

The Hualin Temporary School was realized in the aftermath of the earthquake in Sichuan (China) in 2008. It was designed in a project of cooperation between Chinese and Japanese universities, under the direction of Shigeru Ban.

The Inter-University group, composed mostly by students and volunteers, designed and built in about forty days three buildings, for a total of nine classrooms. The project uses the same technology developed by Shigeru Ban for the Paper Log Houses,[19] introducing some changes in statics and building schemes.

The bearing structure is constituted of four arches, realized with paper tubes connected to each other by wooden joints. They compose a frame, to which are added sliding doors and PVC panels, while the roof is made of corrugated polycarbonate sheets. The high potential value of this project lies mainly in the speed of realization obtained thanks also to dry assembly. Despite its simplicity, it also offers an essential space but of high architectural quality.

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19. The Paper Log Houses were developed after the earthquake in Kobe, Japan, in 1995. For further information refer to http://www.shigerubanarchitects.com/works/1995_paper-log-house - kobe/index.html.

M.U.S.P. is the acronym of the Italian expression for "*solid temporary school modules.*"[20] They are containerized prefabricated structures, suitable to be placed in a number of contexts, up to 1,500 meters above sea level.

They consist of a metal bearing structure with infill insulated panels, which constitute standard units. They can be used individually or combined with each other, according to various distribution patterns, in order to obtain the solution best fitting the users' needs.

Alongside the undeniable advantages (availability, modularity, easy carriage and assembly), however, they present several problematic issues, especially concerning the thermal comfort and the limited possibilities of customization of the aesthetic appearance. In the long term, they may affect the physical and psychic well-being of the users. Nevertheless, they represent the solution of wider use and not only in Italy.

Partition and Furniture: Leafbed vs Education in a Box

Leafbed is a product of the French company Leaf Supply, which designs and realizes cardboard furniture for humanitarian purposes.[21]

It is a patented camp bed, made up of cardboard boxes folded in accordion-shape. Depending on the number of boxes used, it can be a bed or even become, alternatively, a table or a stool.

It can withstand up to 300 kg in weight (a common foldaway bed in aluminium and technical fabric bears only up to about 125-150 kg) and face conditions of up to 75% humidity.

In addition to greater versatility with respect to a common camp bed, it has other positive facets. It can be produced on site, without the need for specialized manufacturing, thus supporting the local economy and reducing the cost and environmental impact of transport. Moreover, this latter could be done in large quantities on wooden pallets. Once its life cycle is concluded, it can be recycled without producing additional waste and more than that, in an emergency context, it can be used in many other circumstances in which it is expected temporary use.

Education in a Box was a program for the education of children affected by disasters, drawn up by the English charity *Education for All*.[22] A normal container filled with educational and emergency supplies, such as tents, furniture, boards, stationery, toys etc., was shipped to affected areas. There, the empty container should have been part of the arrangement of the temporary school prepared with the materials therein contained.

The equipment of one container could satisfy the requirements for up to 200

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20. "Moduli ad Uso Scolastico Provvisorio" in Italian.

21. *Leaf Supply* is a French company engaged in the humanitarian field and in the promotion of sustainable development. It cooperates with national and international agencies and NGOs and it has received several awards for its work. For further information, refer to http://www.leafsupply. com/crbst_0_en.html.

22. *Education for All* is a charity established in the UK in 2007. It collects disposal material and school furniture to ship them to areas affected by disaster consequences, in order to re-establish or start education programs in different countries. For further information, refer to http://www.edu cationforall.com/Education_for_All/Home.html.

pupils and may vary according to special educational needs, from the Early Childhood to Adults education. Surely it was a positive example of recovery and reuse that allows postponing the disposal of still usable facilities. Nonetheless, in any case, they were pre-owned materials, which as in good condition, may have a residual duration limited in time, in the face of remarkable efforts for the procurement and transport.

Results

On the basis of the findings above, a stepwise design method[23] has been constituted for achieving valuable answers, coherent with the theme under examination and also applicable once the emergency has finished.

In the design approach, the attention mainly focused on the interiors, furnishing and on the setting-up, while with regards to the facility structures, they have selected from time to time, among existing projects, and currently in production.

Thus, in accordance with the considerations arisen during the previous phases of the research, the design process outlined the following, sequential stages:

- guidance for dimensioning, analysis of climate distribution, landscape features of Italian territory and selection of four scenarios of action;
- selection of the outer shells, suitable respectively for each scenario;
- identification of the common design guidelines;
- design of the concepts in the strict sense.

They are briefly described hereafter.

From the Guidance for Dimensioning to the Scenarios of Action

The design hypothesis theorizes to accommodate about 60 children, divided into three classrooms.

UNHCR prescribes to provide one school for 5 000 people.[24] UNICEF indicates a minimum area for temporary school buildings should be 1.2 square metres per child, and to be increased in case of Early Childhood Development programs.[25]

Finally, the International Network for Education in Emergencies (INEE) gives Guidance for designing temporary schools with special attention to the safer school construction and the measures that "must still be taken to ensure that

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23. The stepwise design methodology is directly inspired and follows the approach of Bruno Munari, as outlined in B. Munari, *Da Cosa Nasce Cosa: Appunti per una Metodologia Progettuale* (Rome: Laterza, 1981).

24. See "Table 11 – Typical Services and Infrastructure Requirements for Refugee Camps," in *United Nations High Commissioner for Refugees. Handbook for Emergencies*, 1982, 553.

25. See United Nations International Children's Emergency Fund, *Compendium Temporary Learning Spaces (TLS) - Design and Practice in Emergencies*, 2011, 13.

temporary shelters do not pose a further risk to children and teachers."[26]

So, according to this guidance, the proposal concepts have been dimensioned in no less than 90 square metres, calculating that at least 1.5 square metres per child.

Then, the Italian territory has been examined under the profile of the landscape features and the climate distribution, as stated by Wladimir Köppen, in order to select projects which are most suitable to respond to four different situations. These have been selected among the most representative Italian environments, considering that requirements could be influenced in relation to the context where operating.

So, it has been decided to work with three different situations: a cold-tempered mountain context, an urban field with Oceanic climate and a rural zone with Hot-summer Mediterranean climate.

Selection of the Outer Shells

In the next step, through a wide analysis of the newest proposals and most innovative, they have been selected the casings among both those already commercially available or that are still at the prototype stage.

The structures chosen as outer shells should take into account the environmental and climatic characteristics of each context in which it has been hypothesized their use.

Identification of the Design Guidelines

This phase of the design process has been the most complex of the whole study, as they should have been considered and addressed all the issues previously highlighted in the Methodologies:

- the behaviour and needs of children aged 3-6 and their response to sudden and traumatic events;
- the pivotal role played by the school at the physical, psychological and social level in helping both individuals and communities;
- the normal requirements of preschool and the main critical issues of the temporary structures usually devoted to accommodating activities during emergency situations.

All these aspects have contributed to delineating the guiding principles of the developed design methodology that has further an ideal reference to the educational philosophy of the Reggio Emilia Approach. Its idea of quality, in facts, refers to the school environment and foresees the possibility of fluid and spontaneous enjoyment of the so-called relational space.[27]

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26. See Inter-Agency Network for Education in Emergencies (INEE), *INEE Guidance Notes on Safer School Construction. Global Facilities for Disaster Reduction and Recovery*, 2009, 61.

27. Refer to G. Ceppi and M. Zini, *Children, Spaces, Relations: Metaproject for an Environment for Young Children* (Milan: Domus Academy Research Center, 1998), 12-13.

Then, to identify the types of spaces to prepare, the procedure was implemented in two phases. The first one consists of reviewing the activities that are usually carried out at school in normal conditions.

The purpose was to individuate the driving parameters for designing a minimal but complete environment, and being able to satisfy all the requirements, even if in difficulties for space.

At a later stage, evaluated the experts' strategies of intervention in emergencies, they have been compared these two methodologies. Thus, starting from examining the usual organization of kindergarten, broadly speaking, they can be identified three types of areas:

- for ritual moments that mark the school day: "care actions" like coming in and out of school, meals, hygiene, sleep;
- for learning activities: educational activities in the strict sense;
- for free playing and socialization.

In a more detailed classification, the following activities can be considered and organized in specific locations within the school:

- coming in and out: hall, coat hangers or lockers;
- learning activities: at the table, in the classroom;
- free activities: playing, indoors or outdoors (rumpus room or courtyard/ garden);
- meals: snacks and lunch, in the lunchroom;
- hygiene practice: bathroom;
- rest: in the cribs room.

With particular regard to learning activities, some corners inside the classroom are dedicated to a special moment of the day, realizing a subdivision of the unitary space that helps children in identifying and recognizing the several areas. For this, it is possible for the teacher to maintain the possibility of overall control.

It is possible to set corners for different ways of playing that let children improve all their skills and competencies. For example, the games of "Pretending to...", like the puppets, dressing-up or the playhouse, are to heighten socialization, affection and emotion. Motor, graphics and manipulative activities, such as dance or drawing, enhance their body awareness and their knowledge.

Furthermore, books and instruments give to the children the chance to experiment, investigate and deepen their understanding of the world.

Finally, as sometimes it could be hard for children to deal with the absence of parents, or more simply there could be moments of stress during the permanence at school, it's appropriate to provide soft spaces, with rugs and pillows, like "den-spaces". There, it could be possible to relax and use it to hide if in need of solitude.

Naturally, all these indications are not to be intended as duress, but rather a path, a suggestion that takes account the right of children to customize the space over time in a gradually appropriating, free use, and open to changes.

In the second phase, it has been observed an overlap between some school activities and those proposed by psychologists and volunteers during the post-crisis intervention.

It is useful for the victims and helps to cope with the consequences of the experience. In fact, they are particularly suitable for this purpose the *expressive* and *artistic activities*, such as drawing, painting, manipulation, but also *drama*, *story-telling* and *reading* of fairy tales, as well as *psycho-motor activity*. Thanks to these activities, in the hard context of the emergence children can:

- relieve stress caused by old and new sources of fear, as far as possible;
- recognize and express the feelings originated with the new situation;
- share the emotions with friends and adults who take care of them;
- reinforce the relations, enhancing their feelings of belonging to a group, empathy and solidarity.

Therefore, through cross-referencing, we can define what should be the requirements of a state of emergency educational space. In addition to the devices that allow the possibility of satisfying other daily needs, should also be available the following:

- "Pretending to …" corner for *role-playing and drama*;
- Book corner for *reading and narrative*;
- Atelier or other art workshops for *drawing, painting, manipulation*;
- Den-space and soft corner for *intimacy and reassurance exigences*.

Thanks to this analysis and to the highlighted elements, it had been possible to outline the common guidelines for the four design concepts, that so have been declined each one in accordance with the theme previously identified, but, in all of them, keeping the application of the same principles.

The Concepts

In accordance with the considerations explained above, the final step of the design method originated with this research, has been the proposal of four concepts, foreseen for as many different hypotheses of intervention. They share the same underlying stepwise approach, but varying from time to time the choice of the outer shells and their interior settings, depending on the context for which they are envisaged.

They are the pre-cast industrialized house *Armadillo*, a modular structure with high-efficiency energy performances, briefly called *Lègologica* and a dome-shaped structure realized with the Super-Adobe techniques: they are respectively suitable for the urban area, the mountain context and the rural zones. The tepee tent will complete the framework of the options to move, as an ideal solution for the first-aid response, independent from climate and territorial characteristics. All the design concepts shall be described in detail below.

A Tepee for the First Emergency Response[28]

The first design concept deals with the theme of the "first emergency response", to be provided within a period of a few days. The aim is to give a wide-ranging solution, to be easily adapted to different landscape and climate conditions, and that can be quick to set up on site.

For this, it has been chosen a *flexible casing structure*, the Tepee. These are tents that are usually utilised as open-air accommodation facilities, exhibition spaces or alternative households for private individuals as leisure spaces.

Technical Characteristics

Tepees are produced by various companies throughout the world with high-performing materials that ensure very good performances in isolation, waterproof and thermal comfort.

They were chosen the ones that are produced by the Italian-Dutch company *Gioielli del bosco – Bosjuweel*, which has many years of experience in the manufacture of tepees and yurts.

They are available in a range of dimension between 4.5 and 9 meters, to accommodate a minimum of 9 to a maximum of 70 people sitting. They employ a load-bearing structure of about 17 Douglas wood poles, which are linked at one end to form an inverted cone. Subsequently, the structure is covered with sheeting constituted by a double layer of fabric, of which the external one is waterproof and breathable. While the internal protects from the cold, it also contributes to the rise of the combustion fumes from the central heating fire towards the summit opening that can be suitably adjusted according to the wind direction. Both the fabrics are produced by the Dutch company *TenCate* and thanks to their breathability, neither can be affected by condense or hackable by mould.

Even if they have never been used in the context of the emergency response, these features make tepees a suitable solution in this field of application, even more so when it is considered that their performances are significantly better than the ones provided by tents currently used by the civil protection department.

Moreover, the tepee for its highly recognizable archetypal shape could have positive effects on the emotional reactions of children, creating an *elsewhere,* just as a game through which they could deal more lightly with the difficulties of the early stages of the emergence.

Setting

The hypothesis envisages the use of two tepees 8 metres in diameter, connected to each other for a total covered surface area of slightly more than 120 square metres. Therefore, it is more than sufficient to meet the dimensional requirements.

As a first emergency response, it is intended to remain in site for a maximum

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28. See https://bit.ly/2IEKCJ2 or https://bit.ly/2XsgaVV.

of 6 months, the proposed interior solution explores the many opportunities for use of cardboard, both as regards the partitions that the furnishings.

Smaller areas that are allocated to specific activities could be organized using self-standing screens or dividers made of cardboard, wood or fabric.

For example, the *SÉPARÉ* that was designed by students Anna Damoli and Chiara Gutierrez, of the Faculty of Design and Art of the Free University of Bolzano, during the workshop *Container Village - Living in a box*.[29] Built with a ladder and a carpet, it ensures the flexibility of use, being able to assume different configurations and can be customized by the user.

Furthermore, the *Cocoon House* (presented by Ophélie Bertout and Marcus Kistner at the *Carton Plein!* Exhibition)[30] is helpful for separation or as a little hideaway. It is obtained from a single large sheet of cardboard, broken down and folded along a pattern of diagonal lines. Once put into the form it can be used in various ways, depending on the side on which it is resting.

Finally, two projects of the Argentinian design studio *Pomada* employ cardboard barrels in the realization of two elements, particularly suitable for this interior project. A partition, that could also be used to contain when necessary, and the stackable *Chupito* stools, that for their loosely ethnic ornament are particularly in harmony with the character of the tepee (Figure 1).

For the urban context with Oceanic climate, the outer shell chosen is a project that was developed between 2004 and 2005, by the Italian design studio *Atelier2*. It was called *Armadillo*, due to the ribs on the extrados of the panel, that recall its namesake animal's armour. The Italian architects Valentina Gallotti and Marco Imperadori, who both worked in the past with the French designers Eric Dubosc and Marc Landowski, had designed a prototype for an industrialized house in close collaboration with a team of architects, engineers and industrials. In order to achieve the maximum standardization of the construction process, but without losing in terms of quality, it is based on the use of readily available materials and equipment. The result is an architecture industrialized, modular and flexible, with ample freedom of customization in the definition of the size and internal partition.

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29. *Container Village - Living in a box*, workshop directed by professors Claudio Larcher and Giampietro Gai. It took place during the summer semester 2013.

30. *Carton Plein!* exhibition at the Cité de l'architecture à Paris, 03/02 – 28/03/2010. Refer to F. Meadows, *Carton Plein!: 13 Architectes à l' Exercice de la Cabane* (Paris: Édition Alternatives, 2010).

Figure 1. *Concept Design for First-Aid Response*
"Armadillo": House Prêt-à-Porter for the Urban Context[31]

Initially developed for residential purposes, this project is actually characterized by great versatility which makes it suitable for different intended uses, such as for temporary health or school structures, with a prediction of use in the medium and long term.

Technical Characteristics

The basic unit consists of a shell with semi-circular cross-section and rectangular plan size, equal to 6.60×8.00 metres. This is divisible into two subunits from 6.60×4.00 metres where necessary or can be extended up to a length of 12 or 16 metres. One of the greatest strengths of this shell-like structure is the *Elycop* curved sandwich panel. Thanks to the inner layer of polyurethane foam of 80 mm, it ensures better performance in terms of isolation, if compared to the panels most widely used in emergency prefab structures.

The modules can also be joined laterally to each other, solving the fitting

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31. See http://www.atelier2.it/opere/larmadillo-casa-a-guscio-pret-a-porter/.

connection between the two curved surfaces by means of *Elyplast* flat panels, which are produced by the same company. The constructive technology employed in the realization of *Armadillo* involves the use of a supporting frame, constituted by steel profiles and not calendered, mounted on a foundation that is well anchored into the ground.

On this framework, the *Elycop* panels are dry assembled and collaborate to its stiffening while they cover the structure. The closures in the header are complemented by means of pre-painted aluminium windows, as well as steel sandwich panels and polyurethane foam. Inside, the frame allows the anchoring of any partition, achievable into a wide range of possibilities, as well as it is available the broader the range of customization of finishing materials. The assembly process is very fast and takes a few days.

Setting

For this concept, the hypothesis starts from considering an area of about 160 square metres, employing three basic units of 6.60×8.00 metres, side by side to each other, and connected by access on a balcony.

The theme is the adaptability: thanks to movable and removable furnishing and dividers, it is possible to vary from time to time the spatial configuration, accomplishing the need for more space for movement activities, or separation to create quietness and attention.

In this aim, it has been selected the modular partition system *Softwall* designed by the Canadian company *Molo Design*. It is a self-supporting wall made of textile derived from polyester and is 100% recyclable (trade name *Tyvek*). It has the characteristics of flexibility and foldability to its honeycomb structure. Available in three different heights and relative thickness, it can be anchored to a wall and kept closed or alternatively it can be opened to create a soft wall. It is deployable at will, able to soften the sound, and to diffuse or absorb light, depending on the colour chosen (black, white or kraft paper).

Regarding the other furnishing to be considered in the setting of Armadillo, they were selected tables and stools of the Muzzle® series by Paratelier, designed by Italian architects Leonardo Paiella and Monica Ravazzolo.

They are made starting from yellow *Doka* boards used in construction sites, from which are obtained by laser cutting the pieces forming the assembling kit of each element. It will be assembled by means of joints and without the aid of glues or hardware.

To store books and other teaching materials, the *Waybasics* bookshelves and racks could be located in the classroom. They are produced with the *Zboard*, which is a special material obtained from pressed cardboard plates that are treated superficially with bright colours. This makes the material more resistant than the ordinary paper board but retaining its lightness and handling characteristics.

Regarding the soft area for the rest, it could be prepared by using mats produced by the Italian company *Play+* in close collaboration with *Reggio Children*. They are part of an integral line of furniture for the kindergarten, developed by applying to the design process the whole know-how of the *Reggio*

Emilia Approach. The mats chosen for the setting of *Armadillo* can be used on both sides for a dual function, having a more rigid and supported side which is suitable for motor activities. The other one, softer and cosy, is usable for the rest.

In an emergency set-up, this feature allows us not to give up the precious moments for the growth of the children because of the possible scarcity of space.

Finally, interpreting the theme of transformation/convertibility under a different point of view, it was decided to include an igloo, built with plastic bottles, as den-space. This item might be a small self-construction that is to be carried out together with the children themselves, with a view to a shared process and to participate in, which would lead to a finished product expression of the collaboration of all. Its positivity would implement in many respects, not only as regards to the mode of realization but also for the added value of the activity as support for overcoming the traumatic situation. In addition, it would constitute an important shared memory, once the situation has come back to normal (Figure 2).

Figure 2. *Concept Design for Armadillo*

"Lègologica: A House Full of Content"[32]

The structure chosen for the mountain environment is *Lègologica, a house full of content and locally sourced*, according to the name given to it by the designers, Italian architects Francesco Bombardi and Simone Ardigò.

As the name suggests, it has a double reference to the ecology, due to the peculiarity of being completed with natural materials found on site, and the modularity, which is inspired by the famous Danish game of multicolour bricks.

It was exhibited for the first time in Rome in the summer of 2012, during the exhibition at the MAXXI Museum. Thanks to it, the designers and companies that had participated in the creation of the prototype gained the label *Eco_Luoghi 2011*, assigned by the Italian Minister of the Environment.

Technical Characteristics

The basic unit has a size of 12 square metres of net usable internal area. Multiple modules can be combined to be built the layout that best fits the needs of the users. It can be easily transported and assembled thanks to the pre-made building blocks, inspired by the fishing nets. They are to be completed via a self-construction process, using natural material recovered on the site directly, such as leaves, stones, barks and so on.

It is completely autonomous from the energy point of view, due to the presence of the solar panels, and guarantees a perfect thermal comfort in all seasons, thanks to a passive cooling system capable of generating cross ventilation.

The mass and weight of the empty brick shells are filled with local materials and provide stability to the structure without the need for invasive foundations.

The building technology is based on a frame consisting of glulam asymmetric portals. On them is fixed the cover, made of photovoltaic panels and which is consequently closed by a wooden infill that is about 15 cm thick, where can be also housed within the technical installations.

The completion of the structure is entrusted to external blocks of considerable thickness, realized as empty baskets and without load-bearing function. They come to the construction site to be assembled on the spot and filled with materials that are found on site. They have to be provided with particle size and consistency, to ensure high energy efficiency together with the insulating material of the internal infilling.

For the use of natural materials, *Lègologica* sets itself in dialogue with the surrounding environment, morphing in turn with the seasons. Moreover, thanks to the arrangement of the windows that can be freely decided during the installation, it directly involves the user in an empathetic relation with nature and landscape.

Setting

Unlike the previous cases, in this one it was necessary to assume the

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32. See http://www.francescobombardi.it/legologica.html.

opportunity to apply a different method of connection between the units, imagining a plan using 14 of them.

Two could be used individually, one as an office, a teacher room and an infirmary, while the other one as a unit of connection between the classrooms. The remaining 12, aggregated in pairs and placed in a flower-shaped arrangement, could be used as classrooms, a rumpus room and a bathroom. This development plan is approximately 170 square metres.

Due to the double temper of *Lègologica*, which uses natural materials such as wood or leaves and gravel, but is high-tech in terms of building methods, the interior design is played on these features, with key determinant projects mixing nature and artifice.

They are the *Fagus* tree-shaped bookshelves, produced by the Italian society *AL2698;* pouffes *Livingstones* by *Smarin* that seem like real giant stones until you try their softness. The *Puzzle Carpets* by *Magis Metoo* that in their three decorative variants recreate the natural water surface, a lawn or a sandy beach. By the same company, the wire-mesh decoration set *Birds+Clouds* is suitable for a ceiling fixture. *Legno Vivo* by *Riva1920* that is a collection usable as a coffee-table or stools.

By means of these projects, it could be possible to prepare different areas within the pre-school, creating a relaxing environment and situations that evoke various environmental contexts (Figure 3).

Figure 3. *Concept Design for Lègologica*

An Ecological Dome for the Mediterranean Rural Context[33]

The project chosen for the Mediterranean context with a warm temperate climate (*Hot-summer Mediterranean clime*, according to Köppen's classification), is the structure made with coiled sandbags developed by Nader Kahlili. This architect of Iranian origin had always had a particular attention to humanitarian issues. In 1991 he founded the California Institute of Earth Art and Architecture (so-called Cal-Earth), where he developed his research on structures, made with Superadobe technology. Thanks to this innovative construction method, based on traditional building techniques, it is possible to build arches, self-supporting domes and vaults without the aid of camber.

It is a simple, economical architecture and is very durable. It is also often used during crisis situations or where the supply of construction materials is particularly difficult. Furthermore, it could be used in the medium-long term, even in unfavourable warm climates, whereas its high thermal inertia looks like a certainly advantageous feature.

Technical Characteristics

The basic unit is constituted of a central dome surrounded by four semi-circular niches; it can reach the size of 37 square metres and it is possible to combine two modules, in order to obtain a larger housing unit, which is slightly lower than 80 square metres. So, to meet the dimensional requirements, it has been designed using four basic units, three of which are to be allocated to the classrooms, while the last one to host service functions as an office, a changing room and the infirmary.

The utilization of solar energy and radiant panels provide heating, as well as the thickness of the sandbag walls contributes to the maintenance of the indoor thermal comfort with high energy efficiency.

Furthermore, this particular building process consent to integrate in-progress the insertion of masonry, by exploiting the four semi-circular niches on the perimeter. Thus, it is possible to liberate the internal space from clutter, to increase fluidity and functional use.

The Setting

Whereas this concept revolves around the theme of a rural context with a warm temperate climate, the project proposal deliberately puts on hold the organization of interior spaces and it completely devotes its attention to what happens outside the facilities.

Once arranged the four domes around a central court, the project develops the organization of the resulting spaces delimited by the fluid shapes of the four building units, at the centre of the court as well as on the perimeter.

As previously considered, the outdoor activities are of particular importance

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33. See http://www.calearth.org/superadobe-structures-calearth.

for children in normal conditions, and still more to facilitate the overcoming of traumatic events. Consistent with the possible consequences for the region, this project has tried to draw some opportunities for experiences outside the school, without limit them only to the classic playground or sports field, but placing other points of interests for children.

First of them takes its inspiration from *The Maternelle sous Chapiteau*, a project developed in 2008 by *Zoom Architecture* studio with a kindergarten class in Calais. During a workshop dedicated to introducing children to the circus arts, it was included the construction of a small pavilion with lycra and coloured cardboard tubes, ridden by children themselves.

In this case, it may be interpreted as the creation of an *atelier,* within which to gather experimental activities of observation and manipulation or become a sort of small "museum" in which to collect and preserve materials and equipment.

In the organization of the external spaces between the domes, a small area is also provided to be used as a teaching garden. The cultivation and care of plants, in fact, are meaningful experiences for children and can be a valuable aid in stress mitigation in the case of difficult situations such as emergencies.

The participation of the whole group allows the growth of a sense of belonging in children, helping them to strengthen relations and to have again confidence in life and in the future.

Figure 4. *Concept Design for Eco-Dome*

It also might be possible to prepare corners for open-air reading and establish

a mini outdoor library, where cherish books about natural and scientific themes. Eventually, these places could be arranged also as areas for relaxing in the shade of the trees.

Finally, the insertion of a playground is provided as a free zone in which different playing modes, such as climbing, jumping, sliding and swinging could be interpreted in freedom, by means of an organization that follows the natural orientation of the ground.

The paving of the court should be treated with materials of different colours and grain, playing on the development of curves and circular lines and delimiting heterogeneous portions for contours and dimensions. In this way, they could constitute a further and stimulating means for children to make richer their sensory experience (Figure 4).

Conclusions

Since its early beginning, the problem appeared composite and multifaceted: in fact, as discussed above, many components are to be evaluated when talking about children and their special needs. Moreover, considering the extraordinary circumstances that can affect people and communities after any kind of disaster.

The design process outlined in the research follows a logical and rational path, in order to try bridging the distance between the operational language of the designer and the one sometimes excessively theoretical of institutional guidelines.

Thus, the main intention of this research was not to reach a properly defined architectural design, but rather to outline design suggestions, through which bust the myth of a design, that uses "simplicity" as an excuse, concealing inadequacy and shortage of proposals.

The main objection could be that the examples presented are referred to the Italian context only, so focusing on a necessarily limited area. Moreover, it would be in any case a privileged context, compared to other ones clearly more problematic.

Actually, this instance is a direct consequence of architecture and design, that by their nature require to be contextualized, and cut on a framework of demands more or less restricted; also, by reason of the economic affordability.

However, the concept outlined is only an expression that could have been different simply by means of a choice of diverse housing structures and other furniture settings. The most important aspect lies in the possibility of an integrated design process and interdisciplinary, that it could be adaptable to different situations and gradable in each case, according to particular needs or limitations.

As the problems related to emergencies seem to grow and spread more and more widely, it should be responsibility of designers contributing to mitigate their effects, by offering the necessary competence for improvement in terms of quality, both functional and aesthetic.

The purpose of architecture is to protect and improve humankind's life on earth, so as to satisfy its belief in the nobility of its existence. (Eliel Saarinen)

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Designing a Village Museum Ecologically: Reuse of Historic School Building

By Özlem Karakul[*]

The number of the village museums has highly increased in recent years parallel to the increase in the care of the ways of life, intangible cultural heritage of societies. Designing village museums necessitates to understand the tangible and intangible characteristics of village accurately, specifically, both the architectural language of traditional buildings and the cultural practices of people. This study aims to present a process of designing a village museum in a historical building in the village as a common design problem between the disciplines of interior design and conservation. The reuse of the historic building primarily necessitates to deal with both the structural system and the values of the building which constitute the reasons for conservation of the buildings and the architectural significance of the building besides the natural, economic and cultural characteristics of its context. The reuse of historic buildings necessitates its adaptation to the program of the new function by certain interventions, like, new extensions. This study presents a specific framework for reusing of a historic school building in Botsa Village in Konya as a village museum developed within an interior design studio. The design framework is mainly based on discovering the ecological principles of local architecture and oriented to the needs of villagers emerging within cultural and touristic developments.

Introduction

The role of the education in the conservation of cultural heritage has highly been emphasized in the international documents prepared by UNESCO[1] in recent years. From this respect, it needs to prepare specific interdisciplinary courses conforming to the educational aims and processes of the different departments in the school's curriculum. In the departments of architecture and interior design of universities, throughout the studio projects, studying the elements of cultural heritage provides students first to understand the elements of heritage, and its cultural context, and then, to raise their awareness on the conservation of both tangible and intangible cultural heritage.

This study shares an interior design studio experience developed from three discussions on designing "village museum", reusing historic buildings and ecological architecture. Therefore, first, a literature search on the historical development of museum understandings, the reuse of historic buildings and ecological architecture will be discussed and after that, the process and results of the studio experience will be clarified in detail.

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1. Unesco, *The Convention for the Safeguarding of the Intangible Cultural Heritage* (Paris, October 2003).

Historical Overview of Understandings of Museum

From the beginning, museums have generally focused on displaying the various elements of tangible heritage.[2] After the 2003 UNESCO Safeguarding Intangible Cultural Heritage Convention, museums have been accepted as one of the tools for safeguarding intangible heritage on the national level for the implementation of the convention. The understanding of emotions, meanings and values with or without physical embodiment is also crucial for the safeguarding of both tangible and intangible heritage.[3] In this respect, "musealization" approaches need to consider the values and meanings of the people attributed to buildings while displaying intangible cultural heritage[4].

Even if museums conflict with living intangible cultural heritage, especially for the conservation of the disappearing elements of intangible heritage, they are indispensable for collecting, conserving and displaying the material traces of the past.[5] Determining the conflicts between traditional museum practices and living culture, Alivizatou tries to suggest new functions and roles for museums by developing the concept of "post-museum."[6] Especially, the new understanding of museums has responsibility for presenting tangible properties with its cultural expressions or developing new methods to conserve and display intangible cultural heritage. Accordingly, "video and sound recordings of cultural expressions and practices"[7] can be used in museums to display the processes of intangible cultural heritage.

As emphasized in the UNESCO 2004 Expert meeting,[8] museums are a part of their context, either, buildings, gardens, parks, neighborhoods, villages, so, they need to reflect both the physical and cultural qualities of these multilayered contexts in their spatial organization and display techniques. Thereby, museums can also be accepted as a space for gathering living heritage and bearers in every context. For displaying and safeguarding living heritage, local museums have a more crucial role than national museums. From this respect, village museums as local museums need to reflect the soul of their contexts which is constituted by both physical characteristics and intangible values. In addition to this, museums have also gained an educational role to teach local inhabitants in different subjects and local crafts to increase local economic growth and create employment in the village.

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2. M. L. Stefano, "Safeguarding Intangible Heritage: Five Key Obstacles Facing Museums of the North East of England," *International Journal of Intangible Heritage* 4, Jan. (2009): 112.

3. Ibid, 113.

4. Ö. Karakul, "Designing the Museum of Turkey's Intangible Cultural Heritage: A Studio Experience of Interior Architectural Design," *Milli Folklor-International and Quarterly Journal of Cultural Studies* 30, no. 120 (2018): 140-157.

5. M. Alivizatou, *Museums and Intangible Heritage: The Dynamics of an "Unconventional" Relationship* (London: UCL Institute of Archaeology, 2006), 17, 47.

6. Ibid, 48.

7. Ibid, 51.

8. Unesco, *The Roles of Museums in Safeguarding Intangible Cultural Heritage.* UNESCO Convention, October 2003. Position Paper for the Expert Meeting, 2004.

Current Understandings of Reuse of Historic Buildings and Use of Ecological Approaches

The theoretical approaches of conservationists and international and national documents have shared common ground on the necessity of reusing the historic buildings constructed for the different lifestyles and cultures to serve new and contemporary functions through their restoration processes.[9] The management of change is accepted as one of the aims of the conservation of cultural heritage, defined as "the action taken to prevent decay and manage change dynamically" by Feilden.[10] Given this emphasis, it can be stated that re-using existing historic buildings, which have become out- of use in time due to a great variety of reasons, needs to create a new life in harmony with the changing life conditions. According to the contemporary conservation approaches, which have developed after the 1964 Venice Charter all over the world, reusing is considered as the only way to conserve and sustain old buildings[11].

"Adaptation" and "adaptive reuse" are the new terms used for expressing the reuse of the historic buildings. "Adaptation", defined as one of the degrees of intervention for conservation purposes in the Icomos New Zealand Charter includes the interventions from" maintaining its continuing use" or, from "a proposed change of use."[12] The aims of adaptive reuse projects are mainly to conserve the historic buildings; meaning to safeguard their qualities and values, their material substances and ensure their integrity for future generations.[13] Thus, the adaptive reuse of historic buildings needs to have minimal impact on the heritage significance of the building, mainly, the integrity of spatial and architectural characteristics.

The aims of adaptive reuse projects are mainly to conserve the historic buildings; meaning to safeguard their qualities and values, their material substances and ensure their integrity for future generations.[14] Thus, the adaptive reuse of historic buildings needs to have minimal impact on the heritage significance of the building, mainly, the integrity of spatial and architectural characteristics.

The function of "museum", aiming to conserve and exhibit the objects included, is the one not overloading to historic buildings.[15] The adaptive reuse of historic buildings as museums is a complex subject in architectural conservation

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9. D. Kuban, *Tarihi Çevre Korumanın Mimarlık Boyutu: Kuram Ve Uygulama* (İstanbul: Yapı-Endüstri Merkezi Yayınları, 2000); L. Zakar and K. K. Eyüpgiller, *Mimari Restorasyon Koruma Teknik ve Yöntemleri* (İstanbul: Ömür Matbaacılık, 2015); E. Madran and N. Özgönül, *Kültürel ve Doğal Değerlerin Korunması* (Mimarlar Odası, 2005), 158.

10. B. Feilden, *Conservation of Historic Buildings* (London; Boston: Butterworth Scientific, 2003), 3.

11 Karakul, "Designing the Museum of Turkey's Intangible Cultural Heritage: A Studio Experience of Interior Architectural Design," 2018.

12. Icomos New Zealand, Charter for the Conservation of Places of Cultural Heritage Value. 2010. https://bit.ly/2LqJNBa.

13. B. M. Feilden and J. Jokilehto, *Management Guidelines for World Cultural Heritage Sites* (Rome: ICCROM, 1993).

14. Ibid.

15. Kuban, *Tarihi Çevre Korumanın Mimarlık Boyutu: Kuram Ve Uygulama*, 2000.

necessitating to develop conservation measures for both buildings and the included objects. As Madran and Özgönül states "the historic buildings to be converted into museum should also be considered like as an object" to be exhibited, besides the collections included.[16]

Through the reuse process, to use ecological approaches inspiring from traditional architecture helps to achieve harmony with the local architectural language of historic building and environment. In ecological architecture, the terms 'tradition' and 'technology' especially come forward to understand the relationship between natural environment and traditional building technologies.[17] Today, the main objective of the ecological design approaches is "to achieve acceptable indoor environmental conditions for occupants with the least expenditure in energy and materials, replacing non-renewable energy sources with renewable ones and doing away with environmentally unfriendly processes and materials."[18] From this respect, embodying this objective in a great variety of building examples, traditional architecture includes specific lessons to be learned by architects and students to design new buildings. Traditional architecture is a valuable resource to discover the ecological principles with regard to its inclusion of the variety of the nature friendly designs, the usage of local materials and the creative building methods to be inspired by architects.

Turkish traditional architecture is specifically accepted as a successful model for new buildings in terms of "representing our cultural values and the reflection of their erection period honestly."[19] From this respect, these buildings have already been the sources of inspiration for some of the well-known architects, like Le Corbusier, to develop the principles of Modernism.[20] Bektaş investigates Turkish traditional architecture to highlight certain common principles to be considered for sustainability as (1) suitability to life, nature and environmental conditions, (2) realism and rationalism, (3) solution from interior to exterior, (4) harmony between interior and exterior, (5) frugality, (6) the principle of easiness in construction methods, (7) selection and use of local materials nearby environment, (8) elasticity.[21] When reconsidered these principles within the scope of ecological architecture, it can be seen that they completely coincide with the main objective of ecological approaches mentioned above on a large scale.

Arising from the new museum understandings and reuse approaches, this article aims to share an interior design studio experience, carried out in the Department of Interior Architecture in Selçuk University, focusing on a village museum design in Botsa to discuss specific ways to concretize the various elements of local cultural heritage through the reuse process of a historic school

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16. Madran and Özgönül, *Kültürel ve Doğal Değerlerin Korunması*, 2005.

17. Karakul, *Discovering Ecological Principles of Traditional Architecture: Cappadocia Region.* Sustainable Housing 2016-International Conference on Sustainable Housing Planning, Management and Usability, 16-18 November. Porto, Portekiz, 2016.

18. W. Weber and S. Yannas (eds.) *Lessons from Vernacular Architecture* (Great Britain: Routledge, 2014), 2.

19. C. Bektaş, *Koruma Onarım Conservation Restoration* (İstanbul: Y.E.M. Yayın, 1992), 5.

20. E. Kortan, *Le Corbusier Gözüyle Türk Mimarlık ve Sehirciligi* (Ankara: ORTA DOĞU TEKNİK ÜNİVERSİTESİ, 1983), 41-75.

21. Bektaş, *Türk Evi* (İstanbul: Yapı Kredi Yayınları, 1996), 23.

building; and to use ecological design approaches discovered from local building tradition raising the students' awareness of their conservation.

A Design Problem of Botsa Village Museum

The studio project carried out in the spring semester of the 2015-2016 academic year addressed to solve the problem of designing a village museum for Botsa Village to develop various ways for displaying the cultural heritage of the village; besides solving the various social and touristic needs of villagers. Students were expected to develop their design approach by considering both the architectural features of museum buildings and Botsa's cultural heritage besides developing an awareness of contemporary conservation approaches on historic buildings. The methodology of this studio work was mainly based on an interdisciplinary approach necessitating to understand both the elements of intangible cultural heritage of the village from a folklorist's point of view, the elements of tangible cultural heritage from an architects' point of view and the historic building from a conservation architect's point of view. Apart from the prevailing ethnographic approaches on the traditional village museum designs, the village museums to be designed are intended to orient the economic and cultural life of the villagers and to create employment within Botsa.

Historic School Building in Botsa

Botsa (Güneydere) is a village located 45 km far from Meram in Konya. Botsa is one of the settlements in the region of Hatunsaray, which is known as Antique Lystra.[22] The history of the settlement dates back to Iron Age 2000 B.C. according to the findings obtained from Mula and Hatunsaray Mound.[23] Within the village, there are a great number of remains of buildings from the periods of Hellenistic, Roman and Christianity.[24] There are a great number of carved-out buildings which were especially used for the religious activities through Christianity period (Figure 3). The Region is characterized by its peculiar earth formation, which is the product of a very long geological process. The geological formation of the region has been very suitable for construction in terms of carving out easily and as building stones getting hard after exposed to air. Botsa Village was proclaimed as an urban conservation site and III. Degree urban, archeological and natural conservation site in 1994.[25]

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22. T. Bozkurt, "Konya-Hatunsaray (Lystra) ve Cevresindeki Cami ve Mescitler," *Ankara Üniversitesi Dil ve Tarih-Coğrafya Fakültesi Dergisi* 55, Jan. (2015): 3.

23. H. Bahar, "Konya Araştırmaları III; Lykaonia| Konya Merkez Bölgesi," *Selçuk University Journal of Faculty of Letters (Fen-Edebiyat Fakültesi Edebiyat Dergisi)* 12 (1998): 197-206; Bahar, *Konya-Hatunsaray Yerleşmesinde Erken Demir Çağı Çanak Çömleği, Hatunsaray Yerleşmesi'nde Erken Demir Çağı'na Geçiş* (Institute of Turkish Ancient Age Sciences, 2003); İ. M. Mimiroğlu, *Kilistra-Gökyurt, Meram Municipality*. Konya, 2014.

24. Bozkurt, "Konya-Hatunsaray (Lystra) ve Cevresindeki Cami ve Mescitler," (2015): 4.

25. See. The decision of Regional Conservation Council of Cultural properties of Konya numbered 2084 in 05.10.1994.

The peculiarity of the topographical structure and earth formation is a dominant feature among the environmental factors affecting the formation of the settlement characteristics and building typologies, as well as the climate. The earth formation on which the settlement is laid down, is mainly formed by a stream and tuff rocks surrounding Botsa Village. Buildings on the slopes on the north side of stream are placed in an adjacent way and not closing the views of others through the valley (Figure 1).

Figure 1. *Map Showing Location of Botsa* (left) *and an Aerial Photo of the Village* (right)
Source: Google Map (left) and Apple Maps (right).

The traditional architecture of Botsa Village includes both public/ commonly used buildings like carved-out religious buildings, mosque, masjids, village rooms, village school building and fountains and traditional dwellings.[26] The traditional buildings of Botsa Village, both public buildings and traditional dwellings, have been constructed by using stone masonry technique with timber bonds, as seen in the traditional architecture of Konya.[27] The traditional architecture of the village exhibits an authentic stone and timber building tradition with their local characteristics (Figure 2).

The old village school, constructed by using stone masonry technique in 1936 according to the information obtained from the villagers;[28] has various conservation problems due to being unused for long time (Figure 4). The building, which is located on the main street going through the village, has a great garden behind, along the stream.

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26. Karakul, "Bozkırda Yeşeren Köy| Botsa," *Yapı Dergisi*, *Yapı Endüstri Merkezi* 433 (2017): 154-158.

27. H. Karpuz, *Osmanlı'da Konut Mimarisi Konya Örneği* (İstanbul: *Eyüp Sultan Sempozyumu* III, 2000); Karpuz, "Konya'da Halk Mimarisi," *Erdem* 38, no. 10 (2002); O. N. Dülgerler and M. Sözen, *Samples from Konya Houses* (ODTÜ Mimarlık Fakültesi Dergisi, 1979), 5, 1.

28. Informant: Lokman Saraç.

Figure 2. *Street Characteristics and Dwellings*

Figure 3. *Tuff Rocks and Carved-out Buildings*

Figure 4. *Historic School Building*

Projects

Throughout the studio project, students were asked to solve a design problem of interior design of the given building, The Historic School Building of Botsa.

The studio project mainly addressed to solve the problem of the design of a village museum to understand how the design process affected over the consciousness of students about the representation of the physical and cultural characteristics of village over spatial features and about the conservation of the building in the projects.

The studio discussions mainly focused on discovering and exhibiting the spatial aspects of cultural heritage particular to Botsa Village; and construing an ecological architectural approach to provide the continuity of the local building culture. Considering this aspect, students are also expected to develop specific design approaches to provide a continuity in both living and building culture through discovering specific ecological principles embedded in traditional architecture. In this scope, it is intended to develop specific spatial and architectural approaches to test the ecological architectural principles, like green roofs, nature-friendly construction; and the contemporary uses of local building materials.

There were four phases of the studio for the students: (1) preparation of the inventory of the building and site survey (2) literature research on the reuse of historic buildings, museum designs, ecological architecture and the traditional architecture of Botsa Village (3) preparation of the program of village museum considering exhibition halls: one of which is designed for displaying Botsa's cultural heritage, specifically, cultural practices, traditions and traditional craftsmanship, and another for contemporary art exhibitions like painting, sculpture, to be arranged periodically, a multi-purpose hall for the conference and film showing, library and workshops for both local crafts and contemporary arts for providing employment (4) the development of an original conceptual approach and the designing process.

At the beginning of the studio, the students firstly surveyed and measured the school building studied; and prepared its architectural drawings to be used for the design process. Throughout this inventory work, students were expected to understand the values of the building within its context.

The design process of the studio project started with a literature search on the reuse of historic buildings, museum designs, ecological architecture and the traditional architecture of Botsa Village. By making an evaluation of the data obtained from literature search, students formed their specific conceptual approaches including their point of view in reuse, museum design, ecological design and the values of Botsa Village to outline their design of village museum. Throughout the reuse process of historic school building into the museum, the design of new mass additions and underground spaces could also be developed with the individual interpretations of the students.

Through the design stages, the students were encouraged to determine their own principles on the use of local materials and ecological approaches for educating and stimulating villagers and to develop a nature-friendly architectural language. The students were expected to develop a conceptual approach about how to integrate the values of Botsa Village into the interior design of the museum building, to prepare the building programs and the requirement lists and functional relations, to make the spatial analyses of the building by caring the architectural values.

Reconsidering information obtained from literature research and site survey, the students tried:

- To be in harmony with the historic building: creation of a closer dialogue between new design additions and the architectural integrity of the old building, specifically, building elements, spatial characteristics, architectural elements.
- To organize the programmatic requirements: exhibition spaces considering the variety of the local differences and workshops as the special training spaces for educating and transmitting local crafts.
- To utilize interactive and digital tools for revitalization the elements of local cultural practices and craftsmanship within the museum.
- To realize an atmosphere of village museum in the building without disruption of the spatial and authentic character of the historic building
- To discover the ecological sustainable principles of local traditional architecture and use in a contemporary way.

Within the scope of this paper, seven student projects were handled with regard to their specific design approaches and their handling way of the elements of the cultural heritage of Botsa, the requirements of village museum and ecological design in detail.

First Design Work

The main idea orienting the design process of the first design work[29] is to conserve and sustain the cultural values of the village besides creating employment in the village (Figure 5). The main aim of the first project is to bring nature, either in raw or processed way, into the interior; and to make the building one of the works being exhibited. To bring nature into the space, wide openings were used to enjoy the panoramic scenery of the rocky mountains and the rock-cut buildings over them; and; the colors of the nature, like green, orange, white and brown were used on the surfaces of the spaces and furniture. The designer was also used a great number of solar panels on the new roof designed to provide the electricity and warm water for the building. The main design approach is to use the main building for exhibiting Botsa culture and the underground floor newly designed for the contemporary art activities, conferences and workshops. The new mass and space additions to the main building which are designed in a transparent way, includes a circulation space containing a stair going down to the underground spaces on the basement floor and a semi-open terrace overlooking the stream. All new additions were constructed by using local materials, like timber, in a modern and simple architectural style to achieve to be harmony with the architectural elements of the building. The designer uses the main building to exhibit a great variety of the elements of living and building culture of Botsa village and to perform the traditional crafts, like pottery and weaving carpets with the skilled

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29. The project was designed Ahmet Kemal Ünsaçan.

hands of local craftsmen within the historic building without destroying the architectural significance of the building. On the main building, there were also certain spaces designed for teaching pottery for the guests. On the basement floor, which was formed by carving out from the rock under the main building, a multipurpose hall, an exhibition hall and workshops, a café and foyer spaces and a library and reading space were arranged in a modern architectural style. The workshops within the periodical exhibition areas were designed for the guest artists.

Figure 5. *First Design Work*

Second Design Work

The main design approach of the second design work[30] is to use the main building for exhibiting Botsa's cultural values and for teaching local crafts, pottery and weaving carpet; and the underground floor newly designed for the contemporary art activities, conferences and contemporary art workshops, library (Figure 6). The new mass and space additions to the main building were constructed by the laminated timber structure and glass coverings in a transparent way to provide harmony with the historic buildings and its context. On the main floor, within the new building attached to the main building includes an entrance space with a stair going down to the exhibition and foyer space on the basement floor; a café and an exhibition on agriculture and animal husbandry. On the basement floor carved-out from the rock layer under the main building, all spaces were designed in a modern and simple architectural style not to contradict with the historical building architecture and its nearby environment.
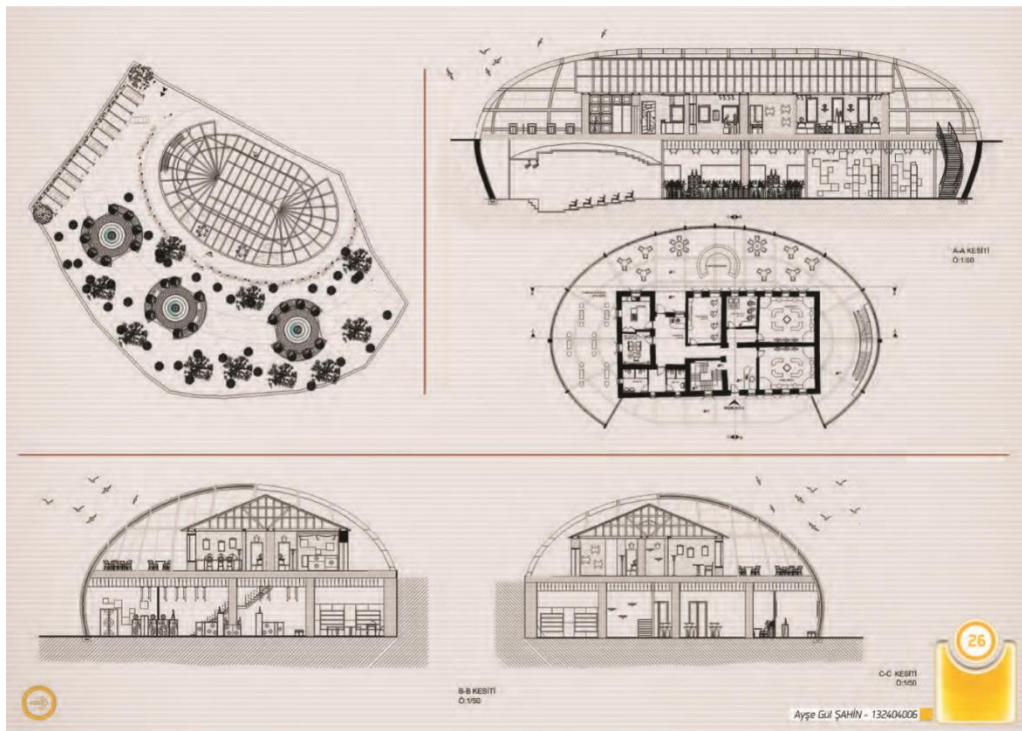
30. The project was designed by Ayşegül Şahin.

Figure 6. *Second Design Work*

Third Design Work

The main idea orienting the design process of the third design work[31] is to use the principles of ecological and accessible architecture. The project used the main building for a permanent and a digital exhibition about Botsa and two workshop exhibition room and a sales unit designed in an open planning understanding (Figure 7). On the carved-out basement floor, there are two workshops for local crafts, specifically, weaving carpets and pottery, a large foyer, a multipurpose hall for the conferences and performances and a library, a cafe and administrative units. The vertical green surface panels assembled into the steel structure, used to surround the terrace spaces, also provide sun control for the main building. In interior spaces of the main building, massive wood, a local building material, was used as the main material of the architectural elements, like shelfs and tables, in a contemporary technique and language to provide harmony with the historic building. Green and brown colors were especially preferred on the interior surfaces and architectural elements.

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31. The project was designed by Meltem Dolmacı.

Figure 7. *Third Design Work*
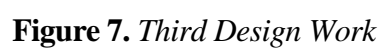
Fourth Design Work

The main design idea of the fourth project[32] is not to make any new mass addition to the main building not to disturb its massive characteristics, only to make a new large basement floor carved out from underground rock formation (Figure 8). The design approach was based on using the main building for exhibitions on Botsa's cultural values and hand crafts and workshops of local crafts; and, the underground floor newly designed for the contemporary art activities, conferences and contemporary art workshops and library. The terrace roof over the basement floor is used as an open café looking into the impressive scenery of the village composed of stream and tuff rocks. The project also tries to sustain local building technology in a modern construction to provide harmony with the surrounding traditional context.
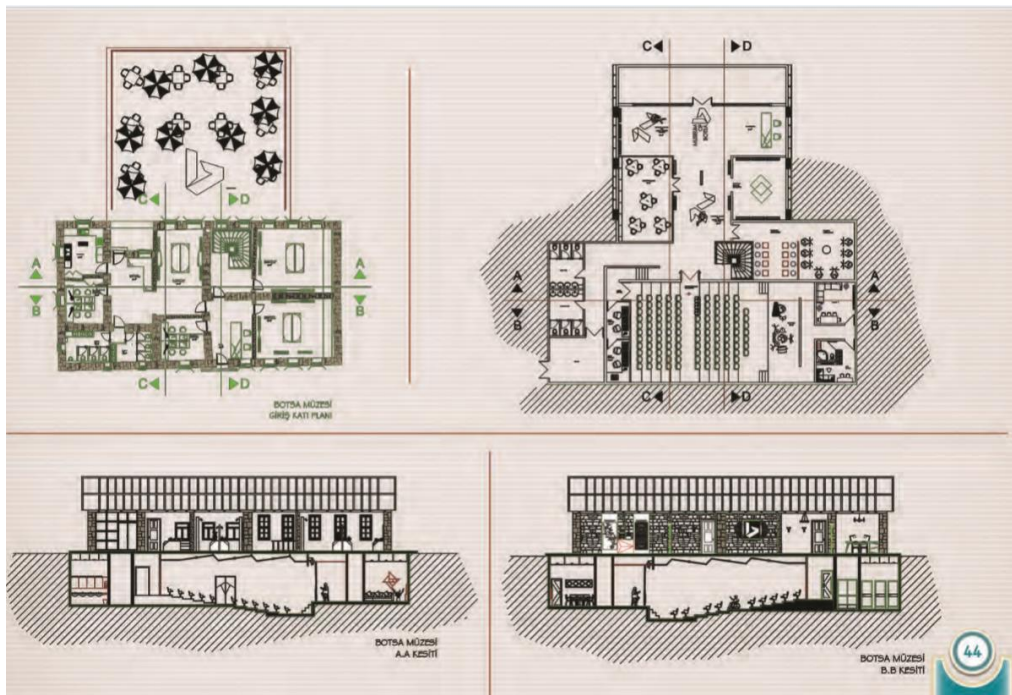
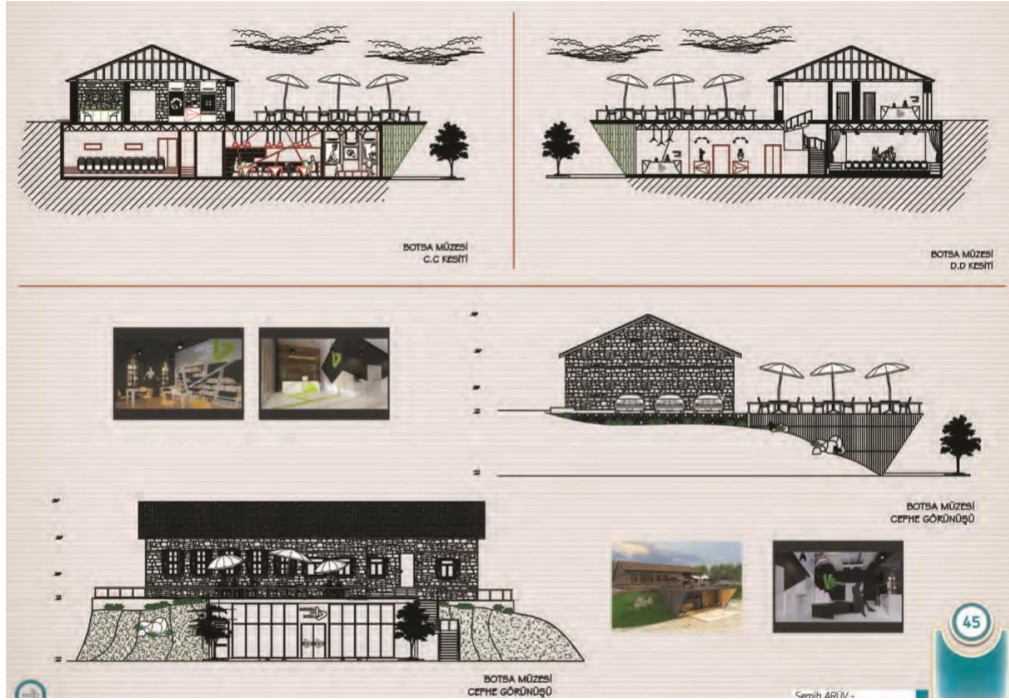32. Project was designed by Semih Arüv.

Figure 8. *Fourth Design Work*

Fifth Design Work

The main design idea of the fifth project[33] is to make a new mass addition to the back side of the main building, designed transparently without disturbing the visual perception of the historic building and of the scenery composed of stream and tuff rocks (Figure 9). Adopting the ecological approaches, the roof of new additional building was completely covered with the solar panels to meet the requirement of the electricity and warm water of the building. The designer used local building materials, like wood and stone besides modern building materials not to destroy the contextual architectural language. The design approach was to use the main building for exhibitions on Botsa's cultural values and hand crafts and workshops of local crafts and a digital exhibition space using digital media related to local cultural practices; and, the basement floor newly designed for the contemporary art activities, conferences and contemporary art workshops and a café. Within the new additional building, there is a café having both semi-open and closed spaces looking into a magnificent scenery. The designer also reinterpreted the form of a local plant, called *üzerlik otu,* which has been used for making amulet for long years in nearby environment, and stylized for using its new interpretations over the interior surfaces and furniture design. The designer used both local building materials, like, wood, glass, and the new ones, like, steel, rope in harmony in the interior of the building. On the basement floor, the carving-out method, extensively used in local building technology, was used for making a

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33. Project was designed by Esra Altıparmak.
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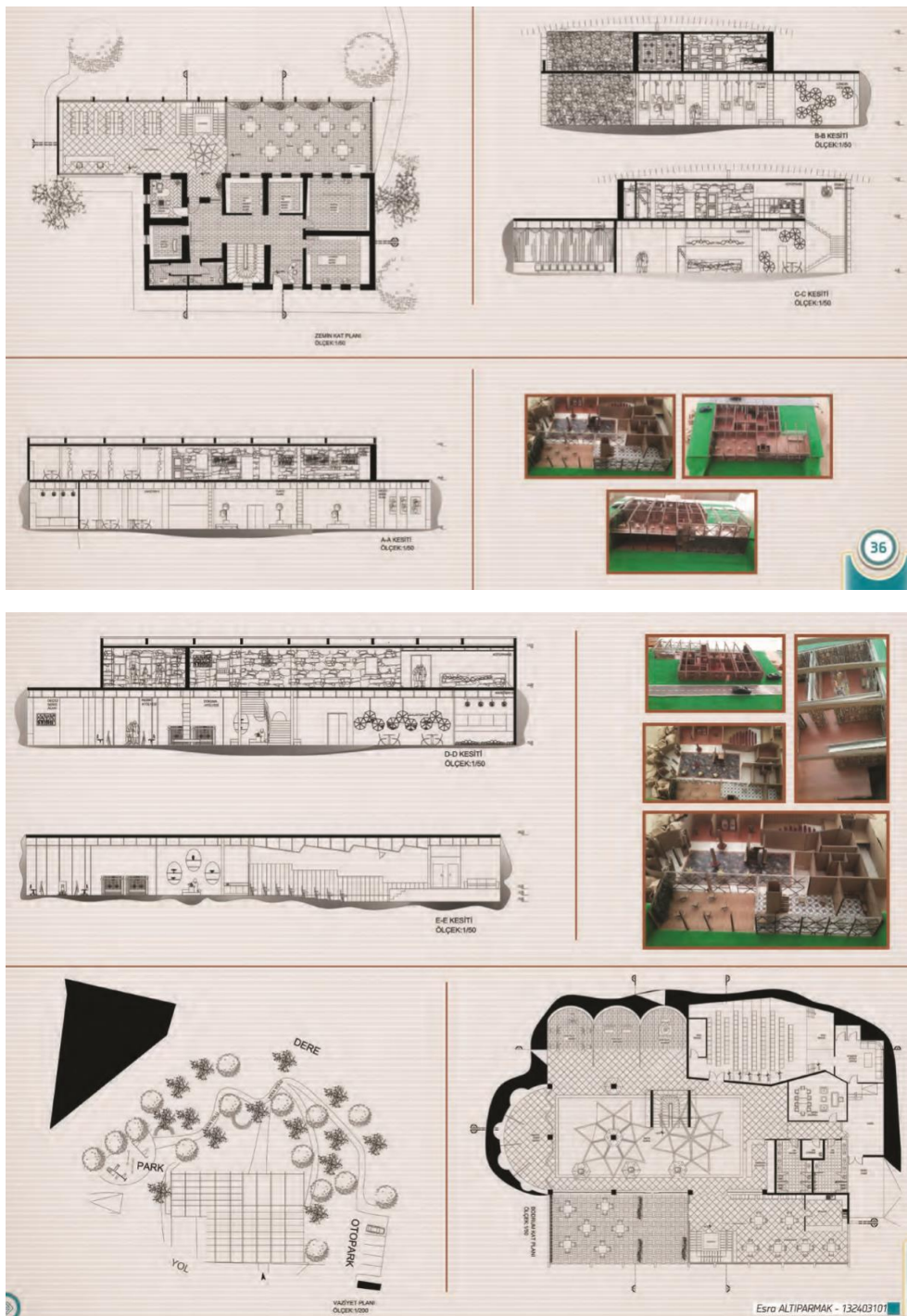variety of niches in different geometries, especially, semi-circular, in a contemporary language.

Figure 9. *Fifth Design Work*

Sixth Design Work

The main idea orienting the design process of the sixth design work[34] is to use the principles of sustainable architecture (Figure 10). Arising from the idea that sustainable architecture aims to create a self-sufficient society in the long term, using contextual possibilities in design process, like local materials, climate, technology and natural resources, the designer used a large green roof over the new mass addition to the historic building and the green surfaces and natural materials on interior wall surfaces and architectural elements. Within the main building, there are different spaces for exhibition on the cultural values of Botsa Village, two workshops on weaving carpet and pottery and a library, and a café on the green open area including a public stair going down to foyer on basement floor between the main building and new addition in which there are a café and an exhibition. On the basement floor constructed by carving, there are two workshops on painting for both adults and children, a library and a multi-purpose hall, and a large exhibition area connected to the foyer.

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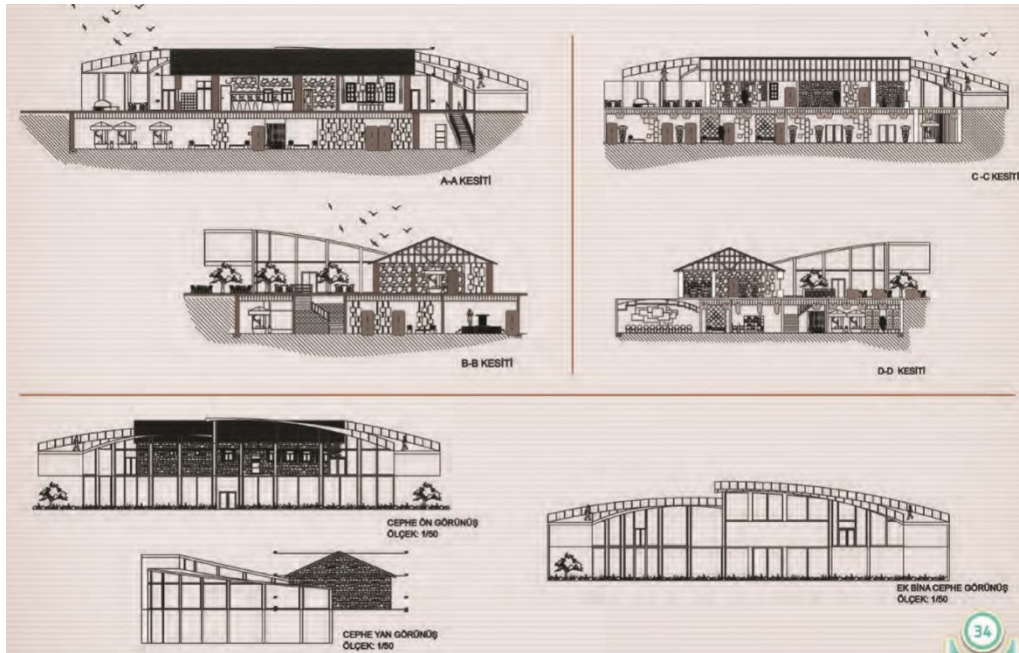
34. The project was designed by Burcu Küçük.
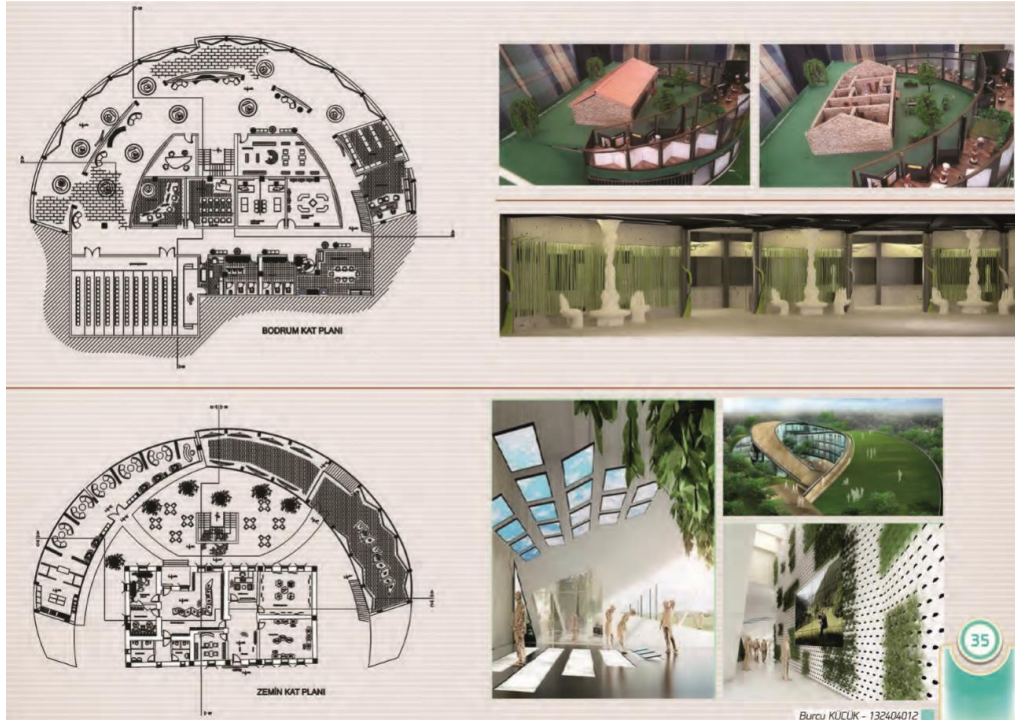
Figure 10. *Sixth Design Work*

Seventh Design Work

The main idea orienting the design process of the seventh design work[35] is to use a local building material, wood, structurally for the construction of new additional building to provide harmony with the traditional buildings and contextual values (Figure 11). The new additions surrounding the historic building in two sides were constructed by laminated timber structures, covered with glass surfaces on top of it to provide transparency and not to disturb the visual perception of the historic building. Within the main building, there are specific spaces for exhibition on Botsa Village, workshops on weaving carpet and pottery and a café and entrance space, designed in open planning, within the new additional building covered with glass, including a sculptural stair going down to foyer on basement floor. On the basement floor constructed by carving, there are two workshops on contemporary arts, and a multi-purpose hall, a closed exhibition space and a large exhibition area connected to the foyer.
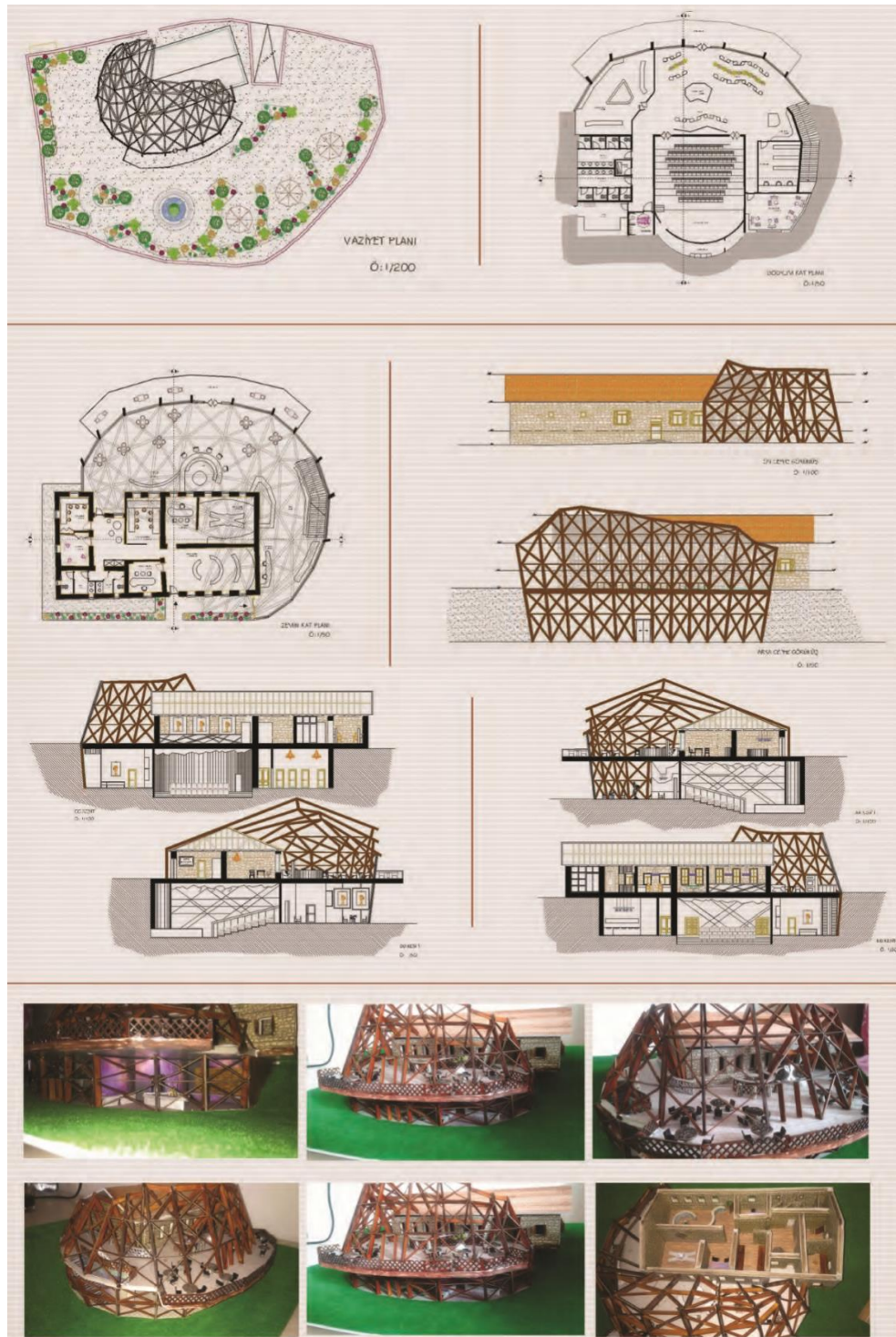
35. The project was designed by Tuğçe Özköse.

Figure 11. *Seventh Design Work*

Discussion and Conclusion

The interdisciplinary studies on the conservation of cultural heritage carried out within the different departments of educational institutions provide to raise the consciousness of the students on both the intangible and tangible values of the historic buildings and environments. This study presented such an interdisciplinary studio project carried out in the department of interior architecture intending to increase the awareness of the students on both conservation of historic buildings and the ecological principles of traditional architecture. The interdisciplinary methodology of this studio work provided students learn thinking like as architects, folklorist and conservation architects to understand the intangible and tangible heritage elements of Botsa Village, the ecological principles of local architecture and the values of historic school buildings to be conserved.

The results of an interior design studio experience on village museum motivated students to understand and care the values of a historical settlement and building, raising awareness on their conservation besides discovering specific ecological principles in local traditional architecture. The common approach of the student projects was mainly based on designing a village museum trying to integrate local values and traditional living culture with the emerging new social, economic needs of villagers and to create employment in contemporary art activities. The projects were mostly common in exhibiting a great variety of the elements of cultural heritage of Botsa besides designing spaces for performing local crafts without any disruption of the originality and integrity of the historic building. Furthermore, the projects had a shared common strategy in using local building materials, like, wood and stone besides new materials; and designing a carved-out basement floor continuing local building culture within the modern architectural technology.

Taking a conceptual approach to interior design, and particularly the themes "village museum", "ecological architecture" and "adaptive reuse" was productive to the department of interior architecture's educational aims and processes. In addition, the selected theme could also be a focus for interdisciplinary study in the school's curriculum. Studying the elements of cultural heritage within a historic building provided students first to understand the elements of heritage, and its cultural context, and then, the building to provide the museum visitors virtual spatial experiences to percept and interact the intangible and tangible heritage of the village together.

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Thinking as Drawing –
Reflections on a Drawing that No Longer Exists

By Teresa Belo Rodeia[*]

Architects use graphic representation to invent architectural objects. As it is not the architect who builds the architectural objects, that work is done by others, it is through confrontation with the object's representation, and not through confrontation with the construction thereof, that such objects are created. One could accept, perhaps it is even desirable, that the drawing is a translation of the thought, returning it to the creator in a new form; but one would also have to acknowledge that the drawing never reveals itself to be an exact record of the thought process. Nevertheless, it is through the drawing that thought becomes understandable, so any lack of correspondence between thought and its representation must be regarded as something more than a deficiency. It is also important to consider the drawing to be more than just a reflection of the thought one wishes to develop further. In contemporary architectural design practice the drawing no longer enjoys the hegemony that a certain nostalgic idealisation of the work of the architect would confer upon it, but the relationship between the drawing and the design thought process remains closely knit, in that the creation of architectural objects continues to be dependent on representation thereof. Using a specific design process as an example – the Gallo House (1968-1970), in São Pedro de Moel, Portugal, by Manuel Mendes Tainha – in which the drawing was a decisive presence, this paper seeks to study the relations between thought and representation beyond the general notion of a certain subordination of the representation to the thought that brings it about. It is through the drawing that the thought can be realised, for it then to be confronted with the drawing.

Introduction

Architects make use of representation in conceiving architectural objects. As it is not architects who build those architectural objects, for that is the work of others, said objects are engendered proceeding from confrontation with their representation, and not from confrontation with their construction.

It may be admissible – perhaps even desirable – that the drawing translates the thought, returning it to whomever thinks it, but it must be recognised that what the drawing reveals is never an exact reflection of the thought. Nevertheless, it is through the drawing that the thought is made understandable, so that it is important to consider that this non-alignment between thought and representation is more than just an inadequacy. One must also consider that the drawing is more than just a reflection of the thought that one wishes to elaborate.

The presence of the drawing in contemporary design practice may no longer enjoy the dominant status it was once given by the nostalgic idealisation of the work of the architect, but the relationship between the drawing and the

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design thought process remains a questioning one, as the invention of architectural objects remains dependent on representation.

Figure 1. *Gallo House, São Pedro de Moel, Portugal*
Source: Teresa Belo Rodeia, 2012.

Based on a specific design process – for the Gallo House (1968-1971) in São Pedro de Moel, Portugal (Figure 1), designed by the architect Manuel Tainha[1]

1. Born in Paço de Arcos in 1922, Manuel Tainha graduated in Architecture from the Lisbon School of Fine Arts in 1950. He worked with Carlos Ramos and at Lisbon City Council, where he interned under the planner Faria da Costa until 1954.

He was a member of the Architectural Association of London from 1959 onwards. His body of work is one of the most important in the context of Portuguese architecture in the latter half of the 20th century, with several of his buildings featuring on architectural heritage lists and/or on the Iberian DOCOMOMO register. Amongst other awards, he is the recipient of the AICA Prize (1990), the Valmor Prize (1991) and the National Prize for Architecture (1993). He took part in several exhibitions in Portugal and abroad and also represented Portugal at several congresses of the International Union of Architects (UIA) – Lisbon, 1953; The Hague, 1955; and Paris, 1965. He also participated in successive editions of the General Fine Arts Exhibitions in Lisbon between 1950 and 1956. Some of his works were included in the Exhibition of Portuguese Architecture (London, 1956) and the Contemporary Portuguese Architecture show (Washington, 1958).

Between 1955 and 1961 he was co-promotor and co-organiser of the Survey of Portuguese Regional Architecture, which was carried out under the auspices of the National Union of Architects. The survey was published in book form under the title *Arquitectura Popular em Portugal* [Popular Architecture in Portugal] (1961). He was co-founder and editor-in-chief of the magazine Binário in 1958 and has authored some of the most important texts on Portuguese architecture, many of them published in magazines and later compiled in books, specifically *Arquitectura em Questão* [Architecture in Question] (1994), *Textos do Arquitecto Manuel Tainha* [Texts by Architect Manuel Tainha] (2000) and *Manuel Tainha, Textos de Arquitectura* [Manuel Tainha, Texts on Architecture] (2006). He was awarded the UIA's Jean Tschumi Prize for his critical work in 2002.

(1922-2012) – where the presence of the drawing plays an all-important role, this paper sets out to examine the relationship between thought and representation beyond the context of a certain state of subservience on the part of the representation to the thought that gives rise to it.

Notes for Reflection on the Relationship between Design Thought and the Drawing

"During succeeding centuries the importance of drawing, which still in the sixteenth century had sufficient novelty for the authors of treatises to draw special attention to it, became taken for granted. Thus, for example, in the early nineteenth century, the French theorist J. N. L. Durand wrote, 'Drawing is the natural language of architecture.'"[2]

Durand's words cited here by Forty provide insight into the long-established dominance of the drawing in the work of the architect. By arguing that "drawing is the natural language of architecture", or in other words, that the drawing is the perfect means for architecture to find its natural expression, also means that the drawing is at the genesis of architecture, i.e. is at the base of the process that originates it. Drawing would also be the natural language of the architect. In the drawing, the architect finds a clear expression of their thought. Thought and drawing could therefore be understood as merging, becoming one. "What we find here is the belief that drawing can be a neutral medium, through which ideas pass as undisturbed as light through glass."[3] The drawing is, therefore, merely a vehicle for the thought, and goes no further. Assuming that the drawing was involved in defining the thought beyond that more utilitarian dimension would mean, perhaps, to question the intellectual dimension of the work of the architect. The drawing helps to define architectural objects, and makes their communication to those who commission them and those who will build them easier. If mastery of the drawing was reduced, could possibly even perturb that communication. However, it has always been as an instrument, i.e. as a means for the architect to record their thought and to communicate it, that the drawing has been looked at. "Such was, until recently at least, the most common view of drawing within architectural practice."[4] It is important, however, to consider another meaning of that understanding of the drawing. The assumption of the drawing as the "natural

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He devoted a significant part of his life to teaching architecture. He was co-founder, director and teacher of the Artistic Training Course at the National Society of Fine Arts (1965-74) and had teaching roles at the Department of Architecture at the Lisbon School of Fine Arts/Technical University of Lisbon (1976-1992), the University of Coimbra's Department of Architecture (1989-1993) and in the Architecture degree course at Lusíada University in Lisbon (1993-2010). Amongst other positions he held, he was President of the National Union of Architects from 1960 to 1963.

In 2000 Manuel Tainha was awarded the title of Grand Officer of the Order of Prince Henry the Navigator by the President of the Portuguese Republic. He died in Lisbon in 2012.

2. A. Forty, *Words and Buildings: A Vocabulary of Modern Architecture* (London: Thames and Hudson, 2001), 31.

3. Ibid.

4. Ibid.

language of the architect", to use Durand's words, even if that is meant as an appraisal, ends up revealing its relativisation.

Understanding the relationship between design thought and the drawing may benefit from reflection on the implications of a translation process.

Translating obviously involves transposing something from one milieu to another. It is an idea most closely associated with language, but one that can also be used in relation to the representation of architecture. An architectural object can be translated to a drawing, just as a text in one language can be translated to another language. But one must acknowledge that the transfer is never completely transparent. Despite all intentions to the contrary, the result of the translation may not correspond, at least in part, to the original source. Only a certain distancing from this constraint – a suspension of critical disbelief, as we will see – can explain the continued belief that the texture of a text remains intact after a translation. Accordingly, only a distancing from this consequence of the translation makes it possible to understand that one continues to trust in the adoption thereof. This distancing process should also be identified in the representation of architecture. "I would like to suggest that something similar occurs in architecture between the drawing and the building and that a similar suspension of critical disbelief is necessary in order to enable architects to perform their task at all."[5]

Said suspension of critical disbelief has not always been acknowledged, and for this reason assessment of the drawing in architectural design practice is somewhat abstruse. At the root of valuation of the drawing, one discovers a detachment in terms of its role in the design process. Evans also argues: "while on the one hand the drawing might be vastly overvalued, on the other the properties of drawing – its peculiar powers in relation to its putative subject, the building – are hardly recognized at all."[6]

Valuation of the drawing would be different, as indeed would the understanding of its use in architectural design, if one were to assume the difference that it inherently constitutes in relation to the architectural object it represents. Evans again: "Recognition of the drawing's power as a medium turns out unexpectedly, to be recognition of the drawing's distinctness from and unlikeness to the thing that is represented, rather than its likeness to it, which is neither as paradoxical nor as dissociative as it may seem."[7]

Without calling into question the ideas proposed by other authors, and whilst recognising the pioneering nature of Evans' work, the ideas advanced by Daniel M. Herbert in his text of 1993 entitled 'Architectural Study Drawings' are of particular pertinence for this understanding of the drawing. Herbert examines the drawing not so much as a finished object or as an order of thought, but observes its elaboration process and assumes that its "incomplete" and "contingent" character is decisive for the design process. Study drawings, to quote Herbert directly, "are made mark by mark within a design task that evolves in real time, and are always

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5. R. Evans, *Translations from Drawings to Building and Other Essays* (London: Architectural Association, 1997), 154.

6. Ibid.

7. Ibid.

poised between an unresolved past and an unpredictable future."[8] The drawing ceases to be seen as a means of registering a prior thought; it is through the drawing process that the thought is established. For this reason, the relationship between drawing and design thought process should be reassessed. To quote Herbert again: "These drawings are significant, then, not as completed objects but as part of a graphic thinking process. Understanding study drawings requires considering how mental and graphic processes interact in the real time of the design task."[9]

In a way – one could argue on the basis of Herbert's ideas – the drawing adds itself to that which it is supposed to represent, thus influencing the development of its own definition, i.e. the evolution of the design process thinking. It is thus that the value of the drawing for the architect's thought process should be understood.

Based on the framing made possible by these references, it was understood that realisation of this research project would have to involve immersion in the development process for the Gallo House design. Only thus could one observe the to-and-fros between thought and representation.

Some of the known study drawings were analysed in this investigative project with a view to identifying the complex thought process they were embodying, a web of thought that was always somewhere between "an unresolved past" and "an unpredictable future,"[10] as Herbert put it. To a certain extent those drawings were re-executed, thus reconstructing the web of thought. A creative thought process was penetrated and reconstituted. The aim was not, however, to carry out a rigorous archaeological study of the design; but rather, based on the drawings gathered, to identify an underlying logic to the formulation and generation of the process, making it possible to reveal the meaning of the drawing through the constitution of the thought. At all times in the investigative work the approach to understanding of the drawing took into consideration the lack of definition that any design project goes through, even if the built work is known. Looking back, it may seem that the final product, i.e. the built work, was there in the drawing. However, a drawing is always carried out prospectively, meaning that that to which one seeks to give body is as yet unknown.

Gallo House Design Process

"As it is meant to be a permanent home, the house should provide the various and complex activities inherent in family life with an ambience of relative stability and identity [...] so that the notion of house is superimposed by the richer and more complex notion of place."[11]

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8. D. Herbert, *Architectural Study Drawings* (New York: Van Nostrand Reinhold, 1993), 2.
9. Ibid.
10. Ibid.
11. M. Tainha, *Memória Descritiva* (Marinha Grande: Câmara Municipal da Marinha Grande, Processo camarário nº 1299/1969, 1969).

At the end of the 1960s Manuel Tainha (1922-2012) was commissioned by Beatriz and Manuel Gallo to design a house for them in São Pedro de Moel, essentially a summer residential village on the Portuguese coast.

The village of São Pedro de Moel is set in the pine forests of Leiria and is crossed by a small tree-covered valley, at the bottom of which runs the Ôlho stream. The oldest part of the village's built fabric is located at the bottom of the valley next to the sea and on the northern slope of the valley.

From the mid-20th century onwards the settlement was subject to considerable expansion,[12] extending all around the old nucleus. The plot for the Gallo House was located in one of these areas. Roughly trapezoidal in configuration, and sloping considerable, the site was exposed to the north and was bound by the avenue providing access to it and the central valley, which it overlooks, enjoying expansive views over the adjacent and distant surroundings – the pine forest to the east, the village houses to the north, and the beach and ocean to the west.

The house was originally thought of as a permanent home for the Gallos and their three daughters,[13] and was therefore to include three distinct areas: the living/reception spaces – with living and dining room and a play room; the private bedroom areas – with a suite for the parents, a guest bedroom and two bedrooms for the children; and a service area containing a kitchen, pantry and housekeeper/ servants' rooms. In addition to these areas, the respective sanitary installations were to be included and also a shelter for cars/carport.

These were the basic programmatic requirements under which the thought process was begun by the architect, Manuel Tainha: a site opening up at one end onto an exceptional landscape, but also fustigated by winds from the north, that was to be the site of a house that, it was hoped, could become a home.

The architectural design project for the Gallo House commenced in 1968. Construction work began in late 1969. Work on the final architectural design and the furniture/interior design continued alongside the construction work.[14] The house was completed in 1971, with the Gallo family moving into the house in June of that year.[15]

The study drawings that have survived until today are only a small part of those produced throughout the design process for the house. Of these drawings, I would suggest analysing and interpreting a number of them that provide insight into the role of the representation in the evolution of the design thought process.

The first work meeting between the Gallos, as developers, and the architect Manuel Tainha resulted in a number of drawings[16] that seem to have defined, from

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12. The expansion of the built-up area of São Pedro de Moel is taken into consideration in the Preliminary Urban Development Plans of 1947 and 1962 by the archiect José de Lima Franco (1904-1970) (E. Quinta, *S. Pedro de Moel: Um Refúgio Moderno.* Master Dissertation. Faculdade de Ciências e Tecnologia da Universidade de Coimbra, 2010, 40-44).

13. During the house's construction process the Gallos' fourth and last child was born.

14. The furniture design project for the Gallo house, which was considered an integral element of the whole design, was also the work of Manuel Tainha.

15. The house remains in the possession of the Gallo family today.

16. The study drawings that resulted from that first meeting appear as a whole to be quite informal. They take up both sides of a sheet of thick paper (140 g) measuring 32.20 x 19.85 cm, together with a text describing the programme. They generally take the form of floor plans where

the outset, the exact location of the structure. It was decided immediately to place the house close to the western side of the plot, with the aim of freeing up a spacious area for an outdoor/garden area and, at the same time, making it possible to create a connection to the beginnings of the valley that crosses São Pedro de Moel, thus extending it the site visually.
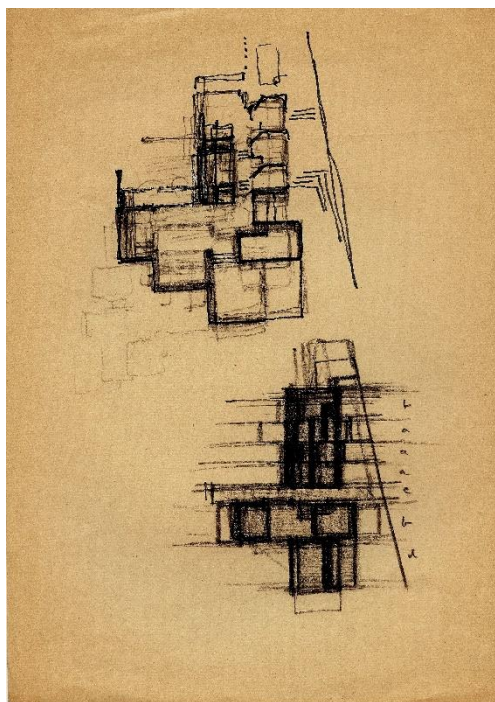

Figure 2. *Gallo House Study Drawings. Graphite on Paper, 21.0 x 29.7 cm*
Source: FCG – Biblioteca de Arte e Arquivos, Espólio Manuel Tainha, DVD 4, Sketch 3.

Figure 2 features two plans for the house facing south that experiment with the possibilities of articulation between the various spaces within the house and between the house and the western boundary of the plot. In both solutions the living/reception spaces are laid out on lower levels of the land to the north and the bedrooms are laid out in a row facing westwards and separated from the bathrooms by a corridor providing access to the bedroom area. Between the living spaces and the private spaces, which are perpendicular to each other, giving rise to a protected exterior area, the kitchen area is proposed, as well as the entrance to the house.

In the uppermost plan (in Figure 2), the living area is fragmented in design and is laid out on different levels, linked by steps, which enhances identification and a certain degree of independence of the three separate zones that make up that

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the whole plot of land is represented, with the built structure occupying the western half only. Despite the informal nature of the drawings – reflected in particular in their speed of execution and a certain lack of concern with proportion between the parts that make up the whole – they already explore the possible links between the various areas of the house, placing the living spaces at the north end, where the site affords more generous views, and the bedrooms parallel to the plot's western boundary. These two areas occupy two bodies perpendicular to each other, forming an L-shape, with the kitchen area at their intersection.

area. These should be, if one reads the drawing from north to south, the dining room (given the closeness to the kitchen) and the living rooms. The latter mainly face south, looking onto the aforementioned protected exterior area, whereas the former seems to establish a relationship with another exterior area (a terrace?) that occupies a position to the east/north. The kitchen area is proposed for the space between the dining room and the entrance to the house.

The sensitive adaptation of the house to the site topography, which is patent in the living/reception spaces, continues on into the circulation space which crosses the interior space longitudinally, providing access to the bedrooms, which are also laid out on different levels. The house hugs the terrain and 'becomes one' with it.

The split levels in the house's interior spaces are accompanied by the exterior access route to the house, which runs parallel to the bedroom volume in a south-north direction. The house itself is accessed in a west-east direction, which requires an inflection in the access route from the entrance to the plot. This access route also serves to separate the bedrooms functionally and spatially from the reception/living spaces.

The lower plan drawing in Figure 2 is more undefined. Whereas the uppermost plan on the same page is made up of several layers, revealing vestiges of other alternatives that were rejected, in this plan the lack of definition derives precisely from the graphic density that results from the superimposition of layers that simultaneously seem to be testing various alternatives in the search for an architectural solution, gauging proportions and configurations and alternating positions for the various parts that make up the whole. Nevertheless, a number of principles are maintained, namely the generic configuration of the whole building and the relative positioning of its constituent parts: the living spaces are still at the north end and the bedrooms still form a line facing south. However, the living spaces now take an L-shaped form and, together with the kitchen area, are clearly separated from the bedroom area by a transversal circulation space. This rupture between the functional areas enhances a frank physical and visual relationship between the house entrance and the interior of the site.

The superimposed solutions experimented with in this plan are based on a modular, rhythmic metric which is given a written reference – "b, a, a, a, c, b, d" – probably in an endeavour to geometrise the architectural design. The bedrooms remain along the western plot boundary – represented by an oblique line – and the plan experiments with disalignment of the bedroom modules, emphasising the idea of the metric by giving it a possible volumic and spatial correspondence. What we have here is a drawing representing investigation of form and compositional experimentation.

The plan in Figure 3 (above, left) would seem to be an attempt to summarise the preceding solutions while seeking the stabilisation of the architectural proposal. It is a clear and legible representation, where the proportions are more calibrated, whereby this control may also come from the metric investigation represented in the preceding plan (Figure 2, lowermost plan) – lines, occupied spaces and voids interact in a search for compositional balance. Now the formal variants are no longer superimposed, in layers, on the same drawing, but are shown side by side.
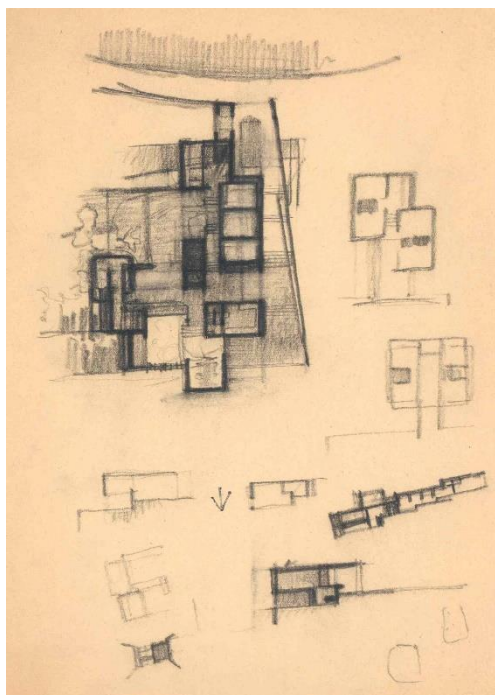
Figure 3. *Gallo House Study Drawings. Graphite on Paper, 21.0 x 29.7 cm*
Source: FCG – Biblioteca de Arte e Arquivos, Espólio Manuel Tainha, DVD 4, Sketch 7.

In this plan, in addition to the western plot boundary – already shown in previous drawings – the southern boundary is also drawn in, providing greater insight into the relationship that the construction establishes with the plot and with the street providing access to it. Also, given the graphic choices in this drawing – the use of stain – one has a better idea of the surface area of the house, both within and without its physical limits. Nevertheless, the architectural solution remains essentially the same: the bedroom volume is laid out in the south/west of the house, the reception spaces occupy a north/east position, with the entrance space continuing to simultaneously separate and create a relationship between these two functional areas.

In this more distended and fragmented solution – which comes closer to the experimented solution in the uppermost plan in Figure 2 – a contained exterior space is shown, slotted in between the bodies that house the living spaces and the bedrooms and protected from the street by a wall; the figure of a patio, previously hinted at, seems to emerge now with greater clarity.[17] The patio now takes on the role of a central space in the composition, towards which the whole house converges, and by means of which multiple relationships can be established between the house and the remaining free area of the plot, i.e. between the house and the pine forest to the east. Simultaneously, from the patio, and not just from the living spaces, it is also possible to read the landscape on the basis of the views over the village (north) and the ocean (west). To use the words of João Rodeia:

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17. In the upper plan in Figure 2 there was a timid representation of a wall, which seems to correspond to the initial layers of the drawing.

"[t]he patio is engendered by the whole while, nevertheless, it continuous to be the spatial bosom of domestic life."[18]

The architectural solution also reveals a certain dichotomy between visual and physical courses, favouring oblique visual lines and orthogonal physical courses; in other words, the orthogonality of the planes that make up the composition and enhance the physical courses of the house is counteracted by the obliquity of its visual permeability, enhanced by the way the living space is configured: divided up by spaces that seem to slide into each other, while maintaining their adjacency. Rodeia once again confirms this design organization: "[c]ontrary to what the corporal evidence might lead one to expect, the effect of rediscovery is immediately recognizable as the main protagonist of this story between intricate and intriguing directions that entwine and mould the spatial plot to daily life."[19] This particular configuration of the living spaces allows, on the one hand and as already mentioned, for identification and a certain degree of autonomy of the various spaces that compose it. On the other hand, and as a result of the aforementioned condition, there would seem to be a great variation in the environmental qualities of these spaces, with the possibility of altering the intensity and source of the daylight, or generating interior/exterior relationships through expansion or contraction of the transition spaces, etc. "In this sense, the design simulation remodels the space in progressive articulations and inflections, makes it pulsate in successive contradictions and expansions, adjusts topographical platforms and juxtaposes them with various openings and cavities that take on a life of their own."[20]

This potential exploration of the house's spaces in ambience terms seems to be given expression in the way how Manuel Tainha creates a relationship with the plot. Rejecting conventional directional exposure – to the north – he opted to present his plans with a southern orientation, denoting its positioning in the interior of the plot and reflecting on the house from that position,[21] i.e. from the inside outwards.

The design brief for the house called for a shelter for cars or carport. In the drawings in Figure 2 one can see the tentative location of such a facility next to the entrance to the plot, on the southern side. This position is confirmed in Figure 3, even if the formal alternatives explored on the right side of plan – where other possible solutions for the southern end to the building are explored – do not take this into consideration.

In Figure 3 there also emerges for the first time a section/elevation that runs through the length of the plot and the house, confirming some information and adding more. It confirms that the house adapts to the topography, overcoming the slope through the use of split levels; it also presents a solution for the roof, also

18. J. B. Rodeia, "A House on the Beach – With regard to Manuel Tainha's Architecture," in *Manuel Tainha: Projectos 1954-2002* (ed.) J. Neves. Porto: Edições Asa: 2002, 31.

19. Ibid.

20. Ibid.

21. Exposure to the south is a constant in the plans throughout the whole Gallo House design project – from the earliest sketches to the formal submission of the design to Marinha Grande Town Council.

consisting of various levels, thus, to a certain degree, also accompanying the natural lay of the land. There is also a volume that sticks out on the roof above the kitchen area, which has its obvious correspondence in the plan in the representation of a vertical access integrated into the living spaces and next to the kitchen. The drawings also experiment with a fenestration metric in the bedroom volume, giving greater meaning to the modulation expressed in the plan. And the drawing also shows the relationship that the northern end of the construction – for which the living spaces are proposed – could establish with the land and the surroundings, with more alternatives for that relationship being investigated in the other cross sections that are located in the lower part of the graphic representation.
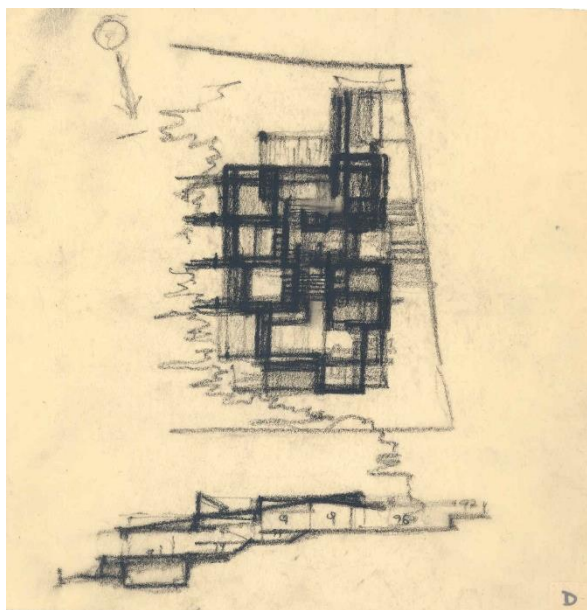

Figure 4. *Gallo House Study Drawings. Graphite on Tracing Paper, 20.4 x 21.0cm*
Source: FCG – Biblioteca de Arte e Arquivos, Espólio Manuel Tainha, DVD 4, Sketch 4.

Whereas the plan in Figure 3 represents an attempt to stabilise the architectural design, that in Figure 4 once again reflects a degree of formal investigation that questions the architectural solution arrived at in the preceding plan. Figure 4 is an extremely dense representation containing multiple layers which presents new possibilities in terms of spatial organisation. Instead of just coming up with a solution, in this representation diverse possibilities are placed in confrontation. The drawing serves to question, investigate and reflect.

As it is drawn on translucent tracing paper it seems to have been produced on top of the preceding drawing (Figure 3,)[22] using its overall metric and the generic composition of the living spaces, but experimenting a new solution for the bedrooms – with exposure to the east and south. The bedrooms now occupy the space that was the patio, which no longer exists at the centre of the composition and the house becomes more compact in terms of volume. The entrance to the

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22. It was possible to confirm this through a reading and subsequent superimposition of one drawing over the other.

house is now moved to the south as a result of both the move of the bedrooms from the west to the east and the extension of the kitchen area.

At the entrance to the plot, the new plan references the parking space, which is confined by a plane on the eastern side that protects a new exterior space (patio) and also limits access to and visibility into the plot's interior. In the plan in Figure 3, the same limit takes the form of a volume that is placed between the entrance to the plot and its interior.

The drawn representation of the southern, western and northern plot boundaries allow for an understanding of the dimensions of the building, which, as it is on one floor only, takes up a considerable area of the plot. Areas of vegetation (suggested by dynamic drawing strokes) surround the house to the east and north. This may be the indigenous maritime pine coverage which would continue on into the valley from there.

Figure 4 also features a longitudinal section of the house, this time drawn on a scale identical to that of the plan. It is a section along the central distribution space, intersecting the steps that link the three levels of the interior space; it also makes the first reference to the elevation measurements. The uncertainties are clearly being reduced little by little, and greater clarity is given to the way in which the building 'hugs' the land, even seeming to openly assume the idea of sinking the house in relation to the road outside the plot. The area between the house and the street, to where the patio is now moved, features a covered exterior space – also represented in the plan – which serves as a transition space between the interior and exterior. This new location diminishes the patio in terms of its protagonism; by forfeiting its central position (in Figures 2 and 3) it no longer assumes its role as an agglutinating element for the house's various functional areas, thus losing its former relationship with the living spaces.

On the opposite side of the house, to the north, there emerges a basement level, already shown in the section drawings in Figure 3, above which the living spaces are located; the latter areas are thus elevated above the natural lay of the land, providing views over the landscape in the direction of the village and the ocean. This suggestion is reinforced by the representation of two (human) figures in the centre of the space.

The section drawing also studies – based on the solution already experimented with previously, which consists of horizontal slabs on various levels – a new alternative for configuration of the roof. It examines the possibility of a single, sloping roof slab that follows the slope of the land, thus enhancing the unity of the interior space. This solution may have been learnt on a visit that Manuel Tainha made around this time to the Maison Carré[23] in France, completed by Alvar Aalto (1898-1976) in 1963. It emphasises the principles of the desired union of the structure with the natural terrain, which had always been an idea that was present throughout the design process.

The importance of Aalto's oeuvre for the work of Tainha is best understood from a later interview suggestively published under the title *Manuel Tainha em directo: sobre Alvar Aalto e outros assuntos*. [Manuel Tainha live: on Alvar Aatlto

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23. Manuel Tainha himself made reference to the Maison Carré as a design inspiration for the Gallo house in a conversation we had on 4 November 2011.

and other isues] "What I essentially assimilated from Aalto was not his drawings, his figurative models, his way of drawing a ceiling, or a pillar, etc.; it was something else, something he wrote about in an article I translated: a method, a way of working, of attacking the drawing and losing the fear of the blank paper."[24] Tainha's translation of Aalto's text was published in Arquitectura magazine in 1953.[25] Many of Tainha's written thoughts on architecture and his approach to design can be traced back to Aalto's text.

A volume that is triangular in cross section stands out on the roof. As it comes with a lightly drawn oblique line linking it to the ground floor of the house, the line indicates a physical connection between the two spaces.

The various plans presented in Figure 5 show the experimentation with new possibilities for the spatial and functional organisation of the house. Previously studied alternatives are explored with regard to the positioning of the bedroom spaces and new proposals are made; also, new options for the location of the living spaces are tested, with them unfolding to the south for the first time; the architectural design is compacted and extended in different areas, essentially playing possibilities against each other in the search for the architectural solution.

In plan 'a', which comes close to the approach experimented with in Figure 4, the bedrooms once again face south/east and the living spaces face north, separated from the former by the kitchen area and the house entrance space. The patio remains between the built structure and the southern plot boundary; it now establishes no relationship with the living room and, consequently, none with the surrounding landscape. However, this solution does assume with greater clarity slight translations in the four modules on the east side of the house – containing the bedrooms and living spaces; this movement provides a visual connection from all said spaces in terms of the uninterrupted views northwards. This interpretation would seem to be confirmed by the vertical lines drawn in the distribution spaces between the modules, indicating visual interior-exterior permeability.

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24. Author's own translation. Original text: "*O que no fundo eu assimilei do Aalto não foram os seus desenhos, os seus padrões figurativos, a maneira de desenhar um tecto, um pilar, etc. mas outra que está já contida num artigo que eu traduzi, ou seja: um método, um modo de trabalhar, de atacar o desenho e perder o medo do papel em branco*". Tainha, "Interview with João Belo Rodeia for Jornal Arquitectos," *Architects Journal* 152 (1995): 26.

25. A. Aalto, "O Ovo de Peixe e o Salmão," *Arquitectura* 46(Feb) (1953): 15-16. Whilst Aalto's text was first published in 1947 in a bilingual version (Italian and English) in Domus magazine, under the titles *Architettura e Arte Concreta* and *Architecture and Concrete Art* respectively (Aalto, "Architettura e Arte Concreta," *Domus* 223-5(Dec) (1947): 103-115,) Tainha translated it from a French-language version, titled *L'œuf de poisson et le saumon,* that was published in the Swiss magazine Das Werk in 1949 (Aalto, "L'Oeuf du Poisson et le Saumon," *Das Werk: Architektur und Kunst* 36(2) (1949): 43-44.
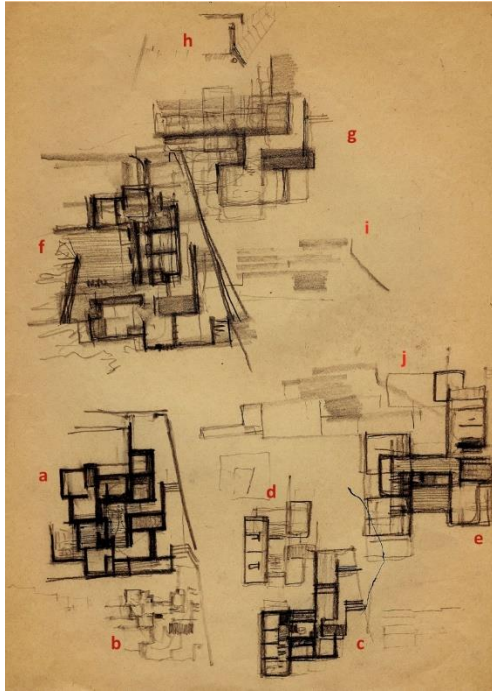
Figure 5. *Gallo House Study Drawings. Graphite on Paper, 21.0 x 29.7 cm*
Source: FCG – Biblioteca de Arte e Arquivos, Espólio Manuel Tainha, DVD 4, Sketch 6.

In a small and faint drawing on the bottom of the page (plan 'b'), the shift in the modules on the eastern side is accentuated and the bedrooms are separated from the living spaces by a void that constitutes an exterior relaxation space that also makes it possible to open up the living spaces to the plot interior. This solution seems to have its genesis in plan 'a', which features an outdoor space contained by two planes adjacent to the living spaces.

Plans 'c', 'd' and 'e' present new compositional experiments. In plan 'c' all the bedrooms on the east are now moved to the northern plot boundary, in an aligned row configuration without any discontinuities. The living spaces occupy almost all of the rectangular body that stretches in a south–north direction from the entrance to the plot and seemingly occupying the central zone in the composition. Accordingly, the living spaces win back their relationship with the plot interior – through the contained exterior space on the south/east – and with the surrounding landscape to the north; however, they are now interrupted by the kitchen area.

Plan 'd' presents a similar solution, making it essentially a variation of the aforementioned solution: bedrooms on the east side and the living spaces on the west, the latter divided up by the kitchen area, which probably separates the dining room from the living room. However, this solution does not seem to foster such a direct relationship between the living spaces and the free area of the plot to the east.

While plan 'e' seems to be a further development of prior solutions, its proposals allow for different readings, as they study diverse superimposed alternatives that reflect the evolution of the design thought process: on the one hand, the bedrooms seem to be integrated into the body on the east of the composition; whilst, on the other, their positioning with a south/west exposure

seems to be experimented with again. The living spaces are located on the lower elevations, partially superimposed on the bedrooms and occupying the whole north front of the structure. They unfold in three spaces that are gradually recessed in relation to the most advanced plane of the façade, and the generic composition is distended. The patio, an exterior space contained to the north and west by the building itself, regains its central role in this solution, and is able to bring the diverse interior spaces into relationship with each other.

Despite the density of the drawings, which results from the gradual process of refinement of the architectural design, the solution experimented with in plan 'f' does not feature superimposed alternatives. The distended solution from the preceding composition (plan 'e') is maintained, which results essentially from the placement of the patio at the centre of the composition. However, the solution still reflects transformation, coming close to the seemingly stabilised solution presented in Figure 3: the patio is now formed by the walls of the bedrooms, which form an L shape to the south and west, and the living rooms and kitchen (to the north), and also by a confining wall to the east, the slanted orientation of which seems to establish a parallel relationship with the eastern boundary of the plot. The patio's central position confers upon it an agglutinating dimension, which is enhanced by the fact that the circulation courses around it create visual relationships from all the spaces in the house to all the spaces in the house, creating infinite possibilities. It also makes something no less important possible: it opens up the living spaces to the south – the most favourable exposure direction – which can be shared with other window openings to the north, where the living spaces also benefit from attractive views of the village and the sea, but where the house also needs greater protection.

Plan 'g' would seem to correspond to an increase in the central area of plan 'f', albeit with the proportions altered and, apparently, the patio being left out: the similarity in the drawings of the kitchen area would seem to corroborate said correspondence. Exploration of a new possibility by the author – in this case, for the first time throughout this process, the positioning of the bedrooms facing south – may have caused him to momentarily leave out some of the elements of the problem to be solved, such as the patio, but which remain implicit in the process and may be returned to later on.

A small drawing – identified as drawing 'h' – is located on the top centre of the page, close to the partial plan 'g'. It is a vertical section perspective which, I believe, corresponds to the finishing work on the building at the southern end, in the area to which the bedrooms were transferred. This section plainly shows the concern with the constructivity of the house: the relationship between the roof and the walls, and between the walls and the floor slab is studied; a drainpipe is shown on the outside of the building where it meets the terrain, avoiding that water can infiltrate from the exterior into the interior which is laid out at lower elevations.

On the set of drawings that make up Figure 5, one should also note the following. It has been registered that plan 'a' is similar to the approach experimented with in Figure 4 that that the more schematic plan 'b' is a variation thereof. Despite the fact that plans 'c' and 'd' reveal a certain degree of proximity in formal terms to plan 'a', the bedrooms are moved to the east side of the house

and the living spaces to the west for the first time. Plan 'e' is a further development of the preceding plans, but it contains, in superimposed layers, variants that were to be developed further in plan 'f'. Finally, in plan 'f', which would seem to be a consequence of all the previous options, returns to the solution presented in Figure 3, which constitutes a prior phase in the design process, as if it were necessary to confirm or reject an architectural solution through confrontation with the representation thereof, whereby it is apparently just as important to represent what one wants as what one does not want. Renzo Piano's statement on the importance of the drawing for understanding architectural problems is an example of this phenomenon: "Unless you draw something, you do not understand it. It is a mistake to believe that now I understand the problem and now I draw it. Rather, right at the time you draw you realize what the problem is and then you can rethink it."[26]

Figure 6. *Gallo House Study Drawings. Ink and Coloured Pen on Paper, 16.4 x 21.0 cm*
Source: FCG – Biblioteca de Arte e Arquivos, Espólio Manuel Tainha, DVD 4, Sketch 5.

The bottom half of Figure 6 features a drawing of the north elevation of the house and the immediate surroundings. As with the other plans analysed, the lot boundaries are also represented on this drawing: to the west, a diagonal line denotes the boundary to the neighbouring plot; to the south, the horizontal line behind the vegetation represents the road providing access to the house. It is interesting to note that drawings 'i' and 'j' in Figure 5 already feature the preliminary structure on which the construction of this elevation is based; the difference being that now the drawing shows with greater conviction and clarity

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26. Renzo Piano quoted by Robbins. E. Robbins, *Why Architects Draw* (Cambridge and London: MIT Press, 1994), 127.

what was still uncertain and murky in the aforementioned drawings. The expression in the drawings would seem to confirm this.

As stated above, this elevation is shown with its surroundings, i.e. the vegetation around the house. This means that the impact of the construction can be minimised, as the existing pine tree coverage is maintained, both in the unbuilt space within the plot (east) and on the northern slope, which was an aim of the design project from the outset.

As far as the external composition of the house is concerned, the elevation reveals a split-level roof that accompanies the sloping terrain and manages to establish a formal correspondence to the fragmentation shown in the plans analysed. By the Figure 6 stage, the author seems to have given up on the possibility of a single slanting roof slab, as presented in Figure 4.

Although the elevation does feature a large opening, there is a predominance of occupied spaces over voids because, as already mentioned, this orientation (to the north) provides the house with more advantageous vistas, even though it will also require more protection from the north. This drawing also for the first time alludes to building materials through the graphic textural effect, given to the façade plane.

The perspective drawing in the upper half of Figure 6 (drawing 'b') translates in three-dimensional terms what is already implicit in the elevation. It provides a clear reading of the compositional relationship between the various volumes that finish the building on the northern end; it provides insight into how the roof folds over the vertical surfaces and how the large opening is enhanced by a volume that stands out against the landscape; textural differences between horizontal and vertical planes are explored, indicating the use of different materials and differentiation in terms of expression between the structure and the surrounding vegetation is confirmed.

Drawings 'c' and 'd', which are, respectively, a perspective and a construction section, develop further the investigation into finish between horizontal and vertical planes, i.e. between the roof and the walls. The difference in the materials that constitute or cover these planes is made evident by the variation in the dimensions of the modules that form the planes, indicating different stereotomic representations. One now understands the reasoning behind the graphic differentiation between the roof and the walls in the preceding drawing ('b'), which is now reflected by an assumed planimetric discontinuity of these two building elements that is shown in both drawings. The section (drawing 'd') studies the constructional feasibility of the architectural solution, seeking correspondence with the image that is desired for the building.

The most impactful drawing in Figure 7 is a floor plan. Despite its limited size – its scale is less than 1:200 – the plan is very detailed and rigorous, to which contributed the use of a fine drawing instrument. One can also detect the use of lines drawn in advance in pencil which served as a support for this drawing. The drawing also makes use of supplementary annotations, such as dimensional references in some spaces/rooms, written notes and schematic sections, which, together, complement the information in the plan.
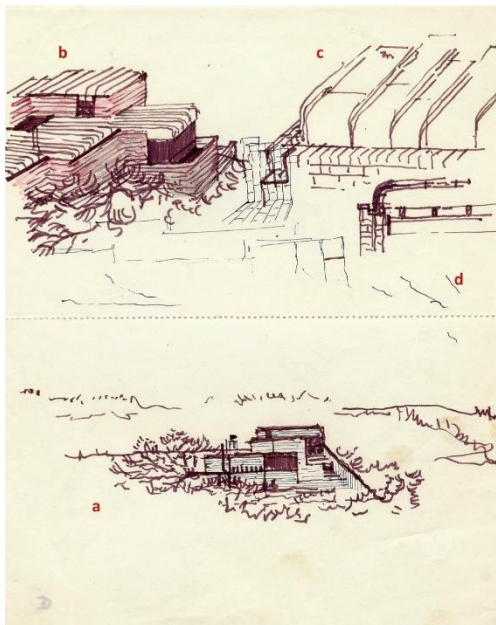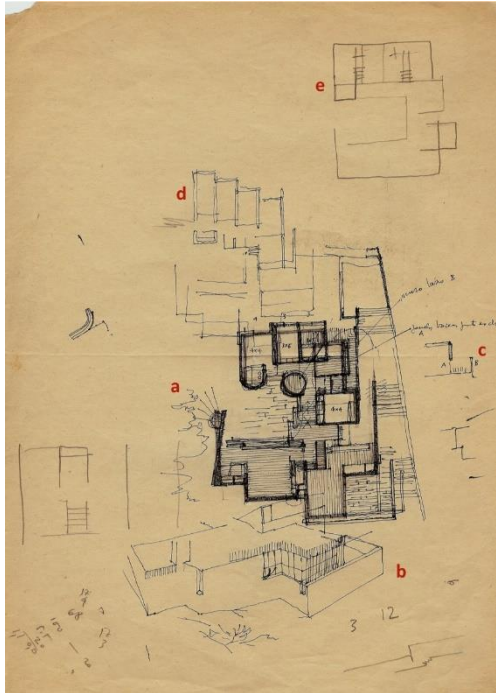
Figure 7. *Gallo House Study Drawings. Graphite and Ink on Paper, 21.0 x 29.7cm*
Source: FCG – Biblioteca de Arte e Arquivos, Espólio Manuel Tainha, DVD 4, Sketch 2.

The architectural solution proposed in this drawing comes closest to drawing 'f' in Figure 5, which in turn was a further development of Figure 3 and a prior plan in the upper half of Figure 2. The house is developed around a central patio, with most of the bedrooms at the southern end and taking in the corner to the west, whilst the living spaces and kitchen areas face north. The entrance to the house separates the private bedroom areas from the living spaces and at the same time connects the exterior to the remaining area of the plot by means of the patio.

The shared spaces are divided into two areas: the dining room, which is linked to the kitchen and has an exterior terrace facing the sea (northwest); and the living spaces, whereby one of them is more contained and features a fireplace, as evidenced by the chimney in the lower perspective drawing (drawing 'b').

In addition to the chimney, a construction element already shown in the elevation drawing in Figure 6 (drawing 'a'), the perspective drawing clarifies the compositional relationships the house's living spaces establish between each other, and complements and adds to the information in the plan. The way in which the dining room opens up onto the landscape is maintained, the relationship between that space and the adjacent terrace is clarified, and one also understands that the other living spaces are more closed in with regard to the exterior, but that this is offset by more intimate relationships with the patio. However this drawing features a new corner window that provides an interesting framed view over São Pedro de Moel valley to the northeast. The perspective also reveals a single-level roof, intersected by a volume (a triangular prism) that provides access to the roof, a solution already experimented with in the section drawing in Figure 4.

The solution for the roof in terms of the number of levels would seem to correspond to a reduction in the split levels inside the house: the bedrooms, living

spaces and entrance space are now laid out on three different levels, whereby the entrance is on the intermediate level. Perhaps the decision taken in drawings 'g' and 'h' of Figure 5 to sink the bedrooms in relation to the elevation of the land, led to that choice.

Despite the considerable level of detail in the plan – revealed, amongst other things, by the refinement in the proportions, the references to the room dimensions, stereotomic representation of the floor coverings, indication of mobile equipment – the architectural proposal still contains a number of uncertainties that require more investigation. There is hesitation in relation to the location of the staircase providing access to the bedrooms, solutions are still being tested for the southwest corner and the oblique intersection of the volumes there, a circular space and other semi-circular spaces to house sanitary installations are still being worked on, and the slant of the eastern patio wall seems to be confirmed. In the upper drawings, alternatives for the southern end of the structure are tested: experimenting with uniform translations of the bedrooms (drawing 'd') or placing them all in one row (drawing 'e').

To the right of the plan there is a small sectional drawing (drawing 'c'), which provides clarification as to the finished look on the western side. The window heights ("low windows next to the floor A") coincide with the adjacent wall ("low wall B").

Before interpreting the final architectural solution, which is partially expressed in the plan and cross section in Figures 8 and 9, two architectural drawings submitted to Marinha Grande Town Council as part of the building permit process for the Gallo House, it is important to point out that the group of study drawings analysed herein is only a small part of those actually produced and only a part of those that have survived until today. Furthermore, the study drawings were accompanied by technical or architectural drawings – not only for greater geometric control of the architectural solution in key phases of the creative process, but also because of the need to communicate to the developer the solutions arrived at over a design project period that lasted roughly for one year.

The main plan for the house (Figure 8) shows the whole plot in the drawing; the building occupies a considerable area of the plot. The occupied surface area results from the option for a single-level solution, with the house built around a relatively spacious central patio, which requires a distended layout of the spaces.

The purchase of the neighbouring plot to the east during the Gallo House design process released Tainha from the need for a more compact layout, which was indeed evident in some of his initial investigation, and no doubt was decisive for the final design choice.

On the basis of the main plan (Figure 8) and a longitudinal section (Figure 9) one can confirm that the functional areas of the house are clearly identified – with the bedrooms at the southern end, the living spaces at the north and the kitchen area, entrance space and covered parking spaces occupying a central position. Identification of these areas is enhanced by a certain degree of simplification of the configuration in relation to the design proposals in the preceding plan (Figure 7) and other earlier plans, which feature a more indented layout.

Figure 8. *Gallo House Architectural Drawing*
Source: Câmara Municipal da Marinha Grande, Processo Camarário nº 1299/1969 [Marinha Grande Town Council, Process No. 1299/1969].

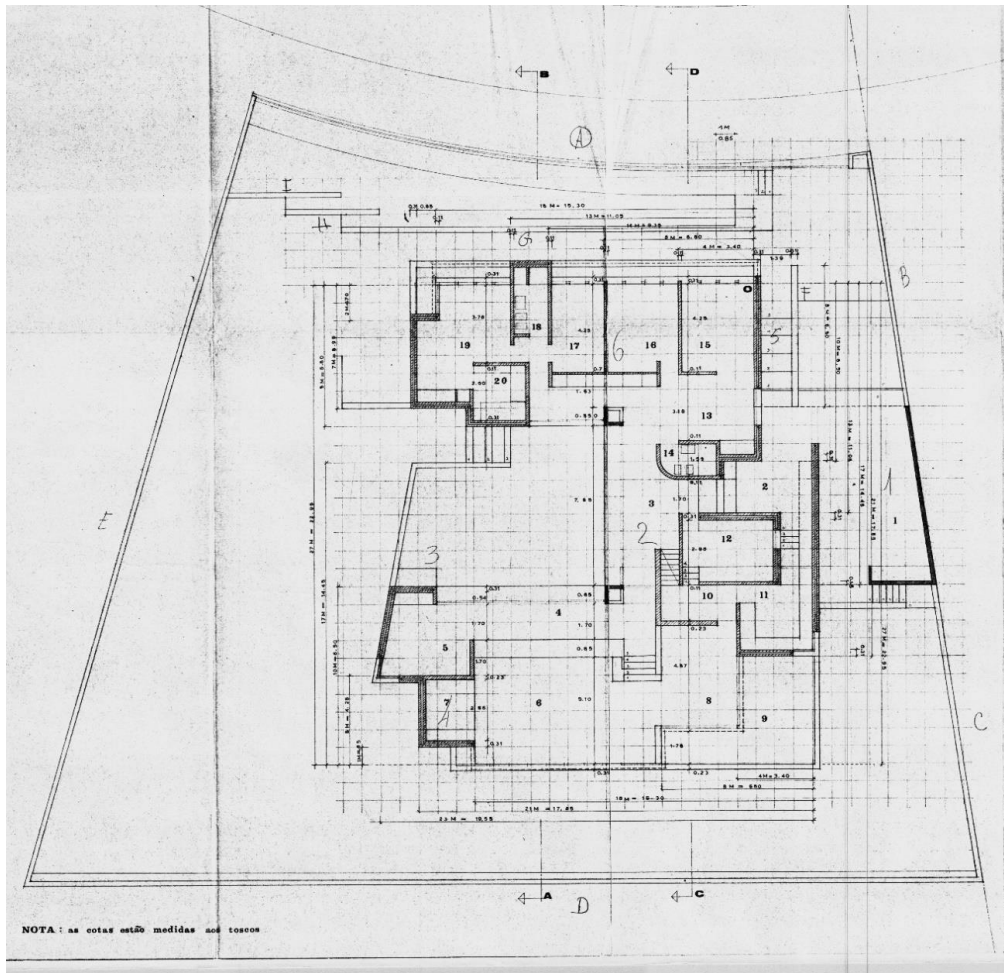**Figure 9.** *Gallo House Architectural Drawing*
Source: Câmara Municipal da Marinha Grande, Processo Camarário nº 1299/1969 [Marinha Grande Town Council, Process No.1299/1969].
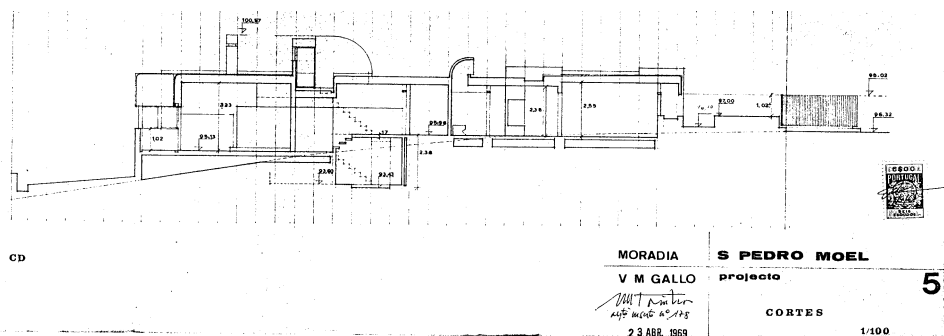
Despite this formal simplification, the composition remains complex and intricate, as is patent, for example, in the integration of the bathrooms as singular elements or in the spatial diversity of the living spaces.

Likewise, whilst in an initial phase the possibility of different levels for the roof was raised, with the levels accompanying the slope of the land, the section drawing in Figure 4 advances the possibility of a single roof, slanting roof plane that accompanies the differences in level. That solution is transposed to the final version (Figure 9) but maintains the roof plane on one single level so as to gain ceiling height in the living spaces. At the same time, this solution unifies the interior spatiality, a principle learnt from the Maison Carré, as mentioned above. With the same aim of unifying the internal space, the reduction in the number of interior levels to one single split level space in the living area also allowed for a more direct relationship between the various functional areas and the patio, as everything is on one and the same level.

The complex and organic geometry of the design is disciplined by the application of a rigid metric, a regulating module that serves to define, using multiples and sub-multiples of 0.85 m, the exact placement of the various construction elements – the height of steps, ceilings and lowered ceilings, skirting boards, low stone walls and door and window spans. Indeed, the plan (in Figure 8) is based on a square module, whereby, in addition to the conventional elevation levels, the number of multiples in each dimension is identified. Curiously enough, the same module is also applied to the rough elements, with the coverings subsequently being applied in specific thicknesses, which reveals concern with rigour in the initial phase of the construction process.

All throughout this process, and despite the testing of multiple possibilities, one can verify that a group of design principles remains a constant. Manuel Tainha called these "formation principles"; they are:

1. Concentration of the built structure in the west of the plot, thus freeing up the remaining area for an outdoor space/garden
2. Adaptation of the house to the topography
3. Clear separation between private spaces, reception/living spaces and kitchen areas, taking their distinct purposes into account
4. A surprise effect in accessing the house: the inside of the house must not be seen from the plot entrance, with only the final inflection in the path to the house making this possible
5. Location of the living spaces facing the landscape, in an attempt to manage the contradiction between exposure to the direction the house most requires protection from and is most advantageous for the house – the house is born out of the struggle against the place
6. The patio as a central, exterior structuring space that determines the organisation of the interior spaces that communicate with it and establish relationships with each other through it
7. Desire for great variety in interior spatial ambiences, making the most out of the different light sources, view lines, changes in height and elevation, etc.

These "formation principles" are a set of rules defined by Tainha that depend on place, programme, culture, taste, emotions, experience; they serve to help

formulate a response to a certain problem that is to be resolved. These rules become relational logics, the founding logics of the design project, whose malleability – which results from their level of abstraction – makes it possible to adopt a number of alternative for one and the same situation, whilst at the same time allowing for work in the design process with a certain degree of security, linking what has already been done to that which can still be done in the future.

It was established over the course of this investigation project that the design process does not follow a linear course; it does not strictly adhere to principles of cause and effect or deductive logic. It is a bumpy path, one that involves a complex web of questions, variable in configuration, the response to which is achieved through successive approach attempts. As this course is sustained, in most cases, by an intuitive procedure – "intuitive logic" – the guarantor of coherence of the architectural solution results from the "formation principles" that guide the production of the proposal. They guide it. But, not as a prior and autonomous iteration of the representation, but rather engendered by the representation itself. Thus, the variable configuration of this web of questions; thus, the malleability of the process; and thus, its unpredictability.

Conclusions

However, one should point out, also by way of a summary, that the reconstruction of the drawing web, which in end effect is the thought process web, revealed a design process that is non-linear – at times erratic, full of advances and retreats, contradictions, chance situations, hesitations and discontinuities. This picture is, of course, more evident in the early design phases, but it is also recognisable in the more advanced phases, even when everything seemed to have its definitive configuration. As was typical for him, Tainha extended the definition process for the Gallo House even into the construction phase. The only thing that seemed to guarantee order in the process from the outset was a certain number of design principles, deemed by Tainha as "formation principles". But those principles are also generated in the drawings. The thought seeks in the drawing both a possibility of order and, simultaneously, a process of constant questioning. And that process continues on until the design task is considered to be effectively completed. One must, however, state that that particular relationship with the design would seem to be consciously convoked.

So it is this two-fold possibility – of order and constant questioning, at the same time – that Tainha recognises, simultaneously acknowledging the connection between drawing and thought.

To cite Tainha: "[it is] in the act of representation that ideas become clearer… or are lost, considering that representing what one thinks and thinking what one represents are, when they occur, one and the same thing" [27].

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27. Author's own translation. Original text: "*É no acto de representação que a deia se clarifica… ou se perde, posto que representar o que se pensa e pensar o que se representa, são na ocorrência, uma e a mesma coisa*". Tainha, *Manuel Tainha, Textos de Arquitectura* (Casal de Cambra: Caleidoscópio, 2006), 122.

I return to the questions that served as the basis for this project – the value of the drawing in the ultimate definition of the Gallo House. By choosing it as his support, the drawing enabled Tainha to confront the lack of definition in his thoughts, and incorporate the unpredictability that marks its evolution; in other words, to work with its ambiguity.

In the drawing Tainha sought to establish an order for the definition of this work; but it was also through the drawing that he challenged said definition with its own feasibility. It is therein that one should understand the value of the drawing in the Gallo House design project.

I will conclude by returning to the title of this paper: 'Thinking as drawing–reflections on a drawing that no longer exists'. I believe that Tainha's approach to the drawing is perhaps less predominant in today's world, even if it continues to be used in practice by referential contemporary architects. But I do not believe that that type of drawing, which no longer exists, should be the object of mere nostalgia. The value of the drawing in the design thought process, which coincides with the value that the representation of architecture should have, should be identified not in the virtuosity with which it approximates the represented object, but in its capacity for enabling the creator to work with the lack of definition that said object will have throughout the design process. A representation that corresponds precisely to its own object is of no use in the architect's design thought process.

The representation leads to the thought; it is the latter's beginning. However, the design thought process does not end in the representation.

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Body Challenges – Between Architectural Scale Models and Architectural Objects

By João Miguel Couto Duarte[*]

"The domain of inhabitable objects that architecture claims as its own finds its first intimation in the model. The model purports to present architecture, not represent it."[1] Scale models have long been recognized as a powerful device for envisioning architecture, having – as architectural objects do – a three-dimensional existence and involving – as said objects also do – a construction process. That is why scale models are still trusted as architecture closest representation, even if the relationship between one and the other must be acknowledged as a strictly arbitrary one, since all relationships of representation are arbitrary. But some scale models seem to aim to question their representational condition. By virtue of their size and also of the materials they are built with, some scale models compel one to enter into them rather than just encounter them, allowing for a comprehensive experience that emulates the experience desirably made possible by the architectural object they represent. The body is challenged to live inside those scale models, to immerse in their interior, even to move through it, with such scale models becoming habitable objects. And even if these scale models do not always find regular use, the history of architecture documents their adoption as a pervasive practice. One question must thus be poised: are such objects still representations, or have they crossed a line and become architectural objects? This paper sets out to discuss the role of the body in the distinction between an architectural object and certain scale models, thus contributing to the inderstanding of both. Rather than on a set of intrinsic features pertaining to each one of those objects, the distinction between one and the other will be sought on how those objects are signified. Those objects become either an architectural object or a scale model depending on how the body challenges itself to get embraced by them.

Initial Considerations

> "The domain of inhabitable objects that architecture claims as its own finds its first intimation in the model. The model purports to present architecture, not *re*present it."[2]

The musealisation of the eleventh century Islamic residential structures found in the archaeological site of Praça Nova do Castelo de São Jorge, in Lisbon, designed by João Luís Carrilho da Graça Architects in 2008,[3] is quite singular in appearance (Figure 1).

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1. C. Hubert, "The Ruins of Representation," in *Idea as Model* (ed.) K. Frampton and S. Kolbowski (New York: Institute for Architecture and Urban Studies and Rizzoli International Publications, 1981), 17.

2. Ibid.

3. The musealisation of the Archaeological Site of Praça Nova do Castelo de São Jorge in Lisbon was commissioned by EGEAC – Empresa de Gestão de Equipamentos e Animação Cultural,

Figure 1. *Musealisation of Islamic Residential Structures, Praça Nova do Castelo de São Jorge, Lisbon*
Photo: Fernando Guerra | FG+SG.

The design presents an elementary white volume consisting of plain surfaces punctuated by just a few narrow apertures, the simplicity of its shape and the smoothness of its walls contrasting with the irregularity of the surrounding archaeological remains and the roughness of the materials of the structures accompanying them. The volume seams to float over the unearthed walls it is meant to protect, its supporting structure remainining unnoticed. Inside, a

a Lisbon City Council-owned company responsible for managing some of the city's cultural spaces. The archeological works on Praça Nova began in 1996, revealing the remains of a settlement dating back to the Iron Age (the first known human settlement in the place that eventually became the city of Lisbon), the medieval Muslim occupation composed of two dwellings and a fifteenth century palace. The project was designed and built from 2008 to 2010, receiving the Piranesi Prix de Rome in 2010. According to the author, the "work addressed the issues of protection, revelation and interpretation of the palimpsest that is intrinsic to any such excavation." Carrilho da Graça Architects, "Musealisation of the Praça Nova Archaeological Site at Castelo de São Jorge," *El Croquis* 170, I (2014): 191.

succession of polycarbonate and timber covered spaces evolving around a patio is defined, based on the remains of each of the two excavated residential structures. The contrast between the contemporary and the already existing elements defines the atmosphere of these spaces, with the supporting structure still going unnoticed. Viewed from above, when accessing the archaeological site from its upper entrance, the pattern of rectangular timber surfaces outlined with white stripes that constitutes the volume's roof plane reproduces the layout of those structures. The transitory presence of an installation emanates from this work, all the more so because of the apparent perennial nature of the archaeological remains that surround it.

João Luís Carrilho da Graça's words provide an insight into his work's singular appearance. His architectural proposal by no means seeks to recreate an actual ancient Islamic dwelling. "[T]he canopy that shelters the Muslim domestic structures and frescoes was taken as an opportunity to reproduce, through a conjectural interpretation, its spatial experience. [...] Professedly abstract and scenographic, the white walls theatrify the domestic spatiality of the two excavated dwellings."[4]

A particular feature contributing to this architectural design's singular appearance should be noted, however. Although it stands as a building, its interior spaces meant to be experienced, this work can also be seen as standing as a scale model – a large white cardboard, polycarbonate and timber scale model designed and executed at a 1:1 scale. Rather than just a random outcome, this is a fully embraced aspect of the design. When asked if his work could be read as a scale model, João Luís Carrilho da Graça answered categorically: "I even usually present it as a scale model! [...] It is a kind of scale model of what may have been there."[5]

These seemingly provocative words might be considered as merely reflecting Carrilho da Graça's well-known penchant for scale models, but such words actually appropriately convey the meaning of his work on the Islamic remains. Having to present a speculative dwelling, with no recreation of an actual Islamic house being desired, the intervention can easily be seen as a three-dimensional representation – large enough to be walked through – of a hypothetical building. Like any architectural representation, the work also lends a presence to an absent architectural object through the act of replacing it. It stands as a presentation scale model of the design project for that object, a three-dimensional synthesis that is the culmination of the design process.

The design project for the musealisation of the Islamic residential remains in Praça Nova do Castelo de São Jorge plays deliberately with the limits of both an architectural object and an architectural scale model, so much so that one is left wondering whether one is experiencing an architectural object that

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4. Ibid, 205.
5. Own translation. Original text: "*Mas eu até costumo apresentar isso como uma maqueta!* [...] *É uma espécie de maqueta daquilo que poderá lá ter* estado". Interview with João Luís Carrilho da Graça. In J. Duarte, *Para uma Definição de Maqueta: Representação e Projecto de Objectos Arquitectónicos.* Doctoral Thesis (Faculdade de Arquitetura da Universidade de Lisboa, 2016), 44 (annexes).

was conceived as if it were an architectural scale model, or an architectural scale model that intimates that it is as an architectural object. There seems to be no clear distinction between architectural object and architectural scale model. The singularity of this design by João Luís Carrilho da Graça derives very much from its ability to make that play.

An Architectural Scale Model's Ongoing Ambition

Entering the territory of architectural objects may be considered to be an ongoing ambition for architectural scale models, as the aforementioned citation from Hubert[6] would have one believe, but some architectural scale models seem to set out to challenge their representational condition. By virtue of their size and also of the materials they are built with, some scale models compel one to enter into them rather than just look at them, allowing for a comprehensive experience that emulates the experience that is supposed to be mada possible by the architectural objects they represent. The body is challenged to habitate those scale models, to immerse in their interior, to move through them, with the scale models thus becoming habitable objects. Even if such scale models do not find regular use, the history of architecture documents their adoption as a pervasive practice. Indeed, it was a practice adopted by Filippo Brunelleschi (1377-1446) for the dome of Florence Cathedral; by Michelangelo Buonarroti (1475-1564) for Saint Peter's Basilica; by Gian Lorenzo Bernini (1598-1680) for the Colonnade of Saint Peter's Square; by João Frederico Ludovice (1673-1752) for the Main Chapel of Évora Cathedral; by Mies van der Rohe (1886-1969) and Lilly Reich (1885-1947) for the House for a Childless Couple; and by I. M. Pei (1917-) for the Louvre Museum extension; to mention only a few.

One question must thus be asked: are those objects still architectural representations, or have they crossed a line and become architectural objects?

Answering this question will require looking at how an object is signified, rather than at a set of intrinsic features pertaining to either an architectural object or an architectural scale model, for at question here is very much the possibility of an object being considered just as much as an architectural object as an architectural scale model.

Some background information on the inquiry as to how an object is signified can be found in Foucault's observations in *L'Ordre du Discours*,[7] which he made after affirming the existence of a certain number of procedures with which all societies aim to control the production of discourse. In seeking to identify a way to overcome said procedures, Foucault calls for a new understanding of the relationship that is established between the discourse and the things of the world that the discourse reveals: "there is no pre-discursive fate disposing the world in our favour. We must conceive discourse as a violence that we do to things, or, at all events, as a practice we impose upon them; it is in this practice

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6. Hubert, "The Ruins of Representation," 1981, 17.
7. M. Foucault, *The Archeology of Knowledge & the Discourse on Language* (New York: Pantheon Books, 1972).

that the events of discourse find the principle of their regularity."[8] Architectural representation is not addressed by Foucault, and identification of the procedures with which control of its meaning is procured is not a focus of this paper, even if such procedures are also internalised by architectural representation. However, by denouncing the supposed natural concordance between discourse and the world standing as its object; by questioning the transparency with which the discourse provides access to understanding of the world; in short, by asserting the limitations of what is known about the world and how it is known, Foucault's exhortation proves its ability to serve as the backdrop to such an inquiry.

Becoming an Object

The Status of the Objects

A basic observation regarding the meaning of the objects must be acknowledged if an inquiry as on how an object is signified is to be pursued: an inherent meaning for an object cannot be taken into consideration, as it is not possible for an object to attribute a meaning to itself; objects are devoid of self-awareness. Thorough attention to the status of the object is required for such an inquiry to be pursued.

Janeiro's approach in *Origens e Destino da Imagem: para uma fenomenologia da arquitectura imaginada*[9] to observation of the relationship that the subject conducts with the world that the subject takes part in and in which the subject defines themselfs – objects accordingly being considered as what the subject distinguishes from tehmselves[10] – will be taken as a mainstay for the intended inquiry on the status of the objects.

Acknowledging that objects do not have an inherent meaning, the meaning of an object can be understood as being conferred upon it by the subject when appariseing it. "Therefore, one can consider that the object *does not exist in itself*, but that its *conditions of existence* are determined by the subject. It is by determining such *conditions* that the subject identifies the object and can read it; in a word, can represent it – when they see it, denominate it, assess it, describe it, draw it, photograph it, design it, etc. – thus being able to construe an *image* of it."[11] If no such representation is accomplished, and no such *image* is construed, outside that of the representation, as representation is "the sole

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8. Ibid, 229.

9. P. Janeiro, *Origens e Destino da Imagem: Para uma Fenomenologia da Arquitectura Imaginada* (Lisboa: Chiado Editora, 2010).

10. Ibid, 16.

11. Own Translation. Original text: "*Assim sendo, podemos considerar que o objecto* não é [...] em si mesmo*, mas que é o sujeito quem lhe determina* as condições de existência*. É ao determinar essas* condições *que o sujeito detecta o objecto e o pode ler, em suma, o pode representar – quando o vê, nomeia, analisa, descreve, desenha, fotografa, projecta, etc. – e, assim, dele pode construir uma imagem.*" Ibid, 34.

possible relationship between the subject and the object,"[12] then there is no existence that would seem to be ascribable to an object.

Objects should be considered representational entities. That is how they acquire a meaning. Rather than an occasional condition, one driven by a circumstantial purpose, representation is a permanent condition of objects.

Submission to a continualy ongoing process of actualisation must be acknowledged as an underlying feature of representation; this means that the representation is successively accomplished and, therefore, also marked by constant modifications and subsequent revisions. Lyotard provides an insight into this continually ongoing updating process that objects always undergo. "The object exists as a "same" which is given to me throughout the continual modifications, and what makes it a thing for me (that is, in itself for me) is precisely the necessary inadequacy of my grasp of the object. [...] In other words, the object as it is given to me in perception is always open on the horizons of indetermination."[13] This verification should be extended to cover reality, whereby reality is considered as encompassing all objects. Reality must also be regarded as a representational entity; that is also how reality acquires a meaning. "We can consider that reality, or, the *thing*, or, the *way-the-"thing"-appears-to-the-subject*, is *representation* and does not exist outside the subject, as it is the subject who provides it with the *conditions for such appearance* or such *representativeness*."[14] Other than representation, therefore, there is no existence that would seem to be ascribable to reality.

The subject's individual dimension cannot be dissociated from the collective dimension – the recognition of reality as a representational entity having to be paralleled by recognition of it as a coded entity. The existence of a code ensures the attribution of meanings therefore allowing for them to be shared, without which no communication would be possible, be it between subjects or with oneself. Although the need for a code might seem superfluous in such personal communication, as the meanings are generated by the subject, the code allows for the very possibility of constitution of a meaning, other than of just confirming it. A possibility of order is provided to the things of the world by the existence of a code, comprehensibility being conferred to them even before communicability is enabled. This is a possibility that must be acknowledged as being provided first and foremost for the subject whenever they seek to comprehend the world they are immersed in. "To speak of the attribution of meaning is to speak of a code that enables such attribution and its consequent decoding. Therefore, *everything* to which culture has given a meaning to, we call *reality* – a cultural entity; or, in redundant terms, a *culturally coded* entity,

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12. Own Translation. Original texto: "*a única relação possível entre o sujeito e o* objecto." Ibid, 39.

13. J.-F. Lyotard, *Phenomenology* (Albany: State University of New York Press, 1991), 48.

14. Own Translation. Original text: "*Podemos considerar que a realidade, ou, a* coisa*, ou, o* modo-como-a-"coisa"-aparece-ao-sujeito*, é* representação *e não existe fora do sujeito, uma vez que é ele, o sujeito, quem lhe possibilita as* condições desse aparecimento *ou dessa* representatividade." Janeiro, *Origens e Destino da Imagem: Para uma Fenomenologia da Arquitectura Imaginada*, 2010, 45.

since the absence of a code implies the inability to signify."[15] Culture can be thought of as the fabric encompassing all codes. Without the existence of a code, there seems to be no possibility of signifying objects and, therefore, of constituting reality. This condition is concomitant with the above-mentioned representational condition of reality.

<div align="center">The Impossibility of an Absolute Reality</div>

One further question is still raised by the status of the objects, and, by extension, by the status of reality.

Although objects emerged as things that are constituted by the subject, their *existence* having to be perceived as an *image* construed by the subject whenever they are in front of or imagining said objects, an impression of the existence of an absolute reality, a repository of all its possible *existences*, may still persist. As Janeiro points out, "one has the idea that the object, reality in general, is *something more*, *something* more saturated."[16] Lyotard's aforementioned "horizons of indetermination,"[17] before which everything is constituted, contribute to the establishment of such a notion, as the overcoming of such indetermination, even if it always a provisional one, is justifiably determined by confronting the constitution of the things of the world with the completeness of the absolute reality.

The existence of such a *something more* must be assessed. If objects are what the subject signifies, the *something more* held by absolute reality must correspond to something that eludes the processes of signification that have been taken into consideration. Rather than something not yet signified, for in such case a signification is admissible, the *something more* must be acknowledged as something non-signifiable, i.e., something that allows no signification at all. The *something more* stands therefore as if it were a signification held exclusively by the absolute reality, with no access to it being possible for the subject. The subject is only permitted an intuition of it.

One must find in such seeming inaccessibility, however, the reason that calls into question the very existence of the *something more*. If its meaning is held only in itself, the *something more* and therefore the absolute reality considered in its completeness, cannot be reached by the subject by facing the world. However, "[w]e can only build knowledge on what we learn, on the experienced."[18] It does not seem possible that any existence of such a *something*

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15. Own Translation. Original text: *"Falar de atribuição de significado, é falar de código que possa instituir essa atribuição de significado, e a sua consequente descodificação. Portanto, a* tudo *a que a cultura atribuiu significado chamamos* realidade – *uma entidade cultural; ou, redundantemente, uma entidade* culturalmente codificada*, uma vez que, a ausência de código implica a incapacidade de significar."* Ibid, 40.

16. Own Translation. Original text: *"tem a impressão de que o objecto, a realidade de um modo geral, é* algo-mais*, algo de mais* saturado." Ibid, 47.

17. Lyotard, *Phenomenology*, 1991, 48.

18. Own Translation. Original text: *"Só podemos construir o conhecimento sobre o que apreendemos, sobre o vivido."* Janeiro, *Origens e Destino da Imagem: Para uma Fenomenologia da Arquitectura Imaginada*, 2010, 48.

more, of something that will always escape representation, can be sustained. Such an existence is from the outset betrayed by the fact that it is identified, for an identification also has to be acknowledged as a representation of the thing being identified. Rather than being held by reality, the *something more* must be thought of as being incorporated by the subject in the representations with which the subject construes what they consider to be the reality. "[T]he *something more*, if it is to be found, must be sought by the subject in themselves. The prospection of the *something more* must be implemented by the subject of the subject (on the subject; in oneself; oneself). In that search, the object will be a mere pretext for self-knowledge."[19]

The impression of a higher saturation of reality should not be abandoned, however. Reality is indeed more saturated than all its representations – even the most complete ones; but that does not mean that reality does not have a representational condition. Reality and its representations have different degrees of saturation, but they all stand as representations, they all stand as differently saturated images construed by the subject about something that they have encountered or imagined.

The Objects Revised

Rather than existing prior to being perceived by the subject, reality is what the subject signifies whenever encoutering the world. Reality is therefore a representational entity rather than an entity in itself. Temporariness emerges as a defining feature of reality.

One always latent doubt, one that is grounded on the comprehension of reality as it has been considered, must be dispelled here: if reality is constituted as a representation and if a representation replaces its object, a return to the arguments supporting the existence of a reality other than the one conceived by the subject seems a justifiable one. A peremptory answer is given by Janeiro to this doubt. "Let us be clear: the image does not replace the object, but replaces the image constituted by the subject in the presence of the object."[20] If an object is actually present, if it is possible to confront it, a juxtaposition between the image created by confronting that object and the very confrontation that gives rise to the image is performed by the subject – the existence of the objects as representational entities should be remembered; if the object is an absent one, either because it is not present or because it does not exist, if it is not possible to confront it, a presence is granted to that object by the subject with recourse to an image stored in the memory that replaces the image that eventually would have been constituted had such an object been confronted.

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19. Own Translation. Original text: *"Portanto, o* algo-mais*, a ser encontrado, deve ser procurado pelo sujeito em si próprio. A prospecção do* algo-mais *deve ser instaurada pelo sujeito ao sujeito (no sujeito; a si próprio; em si). Nesta procura, o objecto será um mero pretexto de auto-conhecimento."* Ibid, 69.

20. Own Translation. Original text: *"Esclareçamos: a imagem não fica em vez do objecto, mas fica em vez da imagem que o sujeito constitui em sua presença."* Ibid, 49.

These processes should never be thought of as taking place in the *now* only, although *now* is when the constitution of the objects is precipitated. Rather than being limited to an instant, the constitution "is impregnated with time, i.e., it consists of a synthesis of the past and the future, whilst holding the opportunity of occurring at the present moment."[21] Each image construed by the subject is part of a succession of other images construed by the subject, with each such succession of images being continuously criss-crossed with other successions of images. It is possible to incorporate that extension of time within the scope of Lyotard's aforementioned comments, with the existence of the object as a 'same' given to the subject throughout continual modifications being pointed out.

It must be made clear, however, what such an image – the image referred to by Janeiro[22] in affirming the entity that such an image stands for in the process of grasping an object – reveals when revealing itself as reality.

A preliminary comment concerning the entity to which the properties revealed by such images belong is needed here. Although, colloquially, properties are referred to as belonging to the objects, they are in fact held by the image that grants said objects an existence. Beyond representation, it must be remembered, reality does not hold any property of its own, as no existence can be ascribed to it. The properties attributed to the objects are those found in such representations, no matter how they are formulated. Therefore, more important than finding out what such images are informed with, which depends on their formulation, a case-by-case examination thus being necessary to accomplish such an inquiry, one should endeavour to understand how they are informed, i.e., under what conditions such the constitution of such images is established.

Space and time form the continuum throughout which the subject unfolds their action, thus establishing the way they encounter and represent the world. The subject does not oppose the world; rather, they comprehend themselves, comprehending the world and comprehending themselves in such a world. Merleau-Ponty's words provide an insightful understanding of such a singular relationship. "I have only to see something to know how to reach it and deal with it, even if I do not know how this happens in the nervous machine. My mobile body makes a difference in the visible world, being part of it; that is why I can steer it through the visible."[23] Such is the condition in which the images as which obejcts are constituted are informed and therefore formed. "Objects *appear* in the world constituted by the subject as images that hold a *virtual spatiality* equivalent, or similar, to the spatiality represented when those objects were directly experienced by the subject at a given time – the time they enter the consciousness; a moment that has already taken place."[24] From then

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21. Own Translation. Original text: "*está impregnada de tempo, ou seja, compõe-se de uma síntese do passado e do futuro, mas com oportunidade de ocorrer no momento actual.*" Ibid, 81.

22. Ibid, 49.

23. M. Merleau-Ponty, *The Primacy of Perception: And Other Essays on Phenomenological Psychology* (Evanston: Northwestern University Press, 1964), 162.

24. Own Translation. Original text: "*Os objectos* aparecem *no mundo constituído pelo sujeito como imagens que possuem uma* espacialidade virtual *equivalente, ou semelhante, à espacialidade representada aquando da experiência directa perante eles em determinado momento – no momento*

on, the objects will be stored in the memory, as part of some of the above-mentioned successions of images.

No object can be thought of as having an intrinsic meaning. To be a specific object is a temporary condition, lasting only as long as the meaning that allows for that specific existence is ascribed to it.

Becoming an Architectural Scale Model

Architectural Scale Models' Temporariness

As it is a model, an architectural scale model may be considered, in a broad sense and after Echenique, "a representation of reality, in which the representation is made by the expression of certain relevant characteristics of the observed reality and where reality consists of the objects or systems that exist, have existed, or may exist."[25] Accordingly, in compliance with the revision of the status of the objects, the representation of an architectural object by a scale model must be considered as being realised by expressing, by the means of the image construed by the subject as which a scale model is constituted, certain relevant characteristics of the image construed by the subject as which the architectural object being represented is also constituted, be it an existing object, one that has existed, or one that may exist. In a representation, two distinct images are presented in a relationship with each other. Only by being distinct from its object can a representation replace it.

However, no sharing of properties should be sought between the images as which an architectural scale model and an architectural object are constituted, as properties can neither be transferred, nor reproduced. Only a coded equivalence of images, a strictly coded one and therefore also a strictly arbitrary one, can be considered here. Only on the basis of such an equivalence can the scale models of one and the same architectural object take on such different formulations, ranging from conceptual models to realistic miniatures. The still common belief in the natural resemblance that scale models have with architectural objects because they share a three-dimensional existence proves therefore to be untenable. No natural relationship can be found between an object and its representations. The completion of representation is decoupled from resemblance, as Goodman has already argued – "Plainly, resemblance in any degree is no sufficient condition for representation."[26]

An object can be an architectural scale model because, according to a given system of codes, that is commonly recognised on a tacit basis, be it out of the habit or the context, that object is correlated with an architectural object, thus replacing

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em que apareceram à consciência; um momento que já foi presente." Janeiro, *Origens e Destino da Imagem: Para uma Fenomenologia da Arquitectura Imaginada*, 2010, 81.

25. M. Echenique, "Models: A Discussion," in *Urban Space and Structures* (ed.) L. Martin and L. March (Cambridge: Cambridge University Press, 1975), 164.

26. N. Goodman, *Languages of Art: An Approach to a Theory of Symbols* (Indianapolis and Cambridge: Hackett Publishing Company, Inc., 1976), 4.

it. Only as lon as that system of codes remains in force can an object be perceived as an architectural scale model. The immediacy with which some objects are perceived as architectural scale models cannot be mistaken for an evidence of an intrinsic signification held by said objects.

Identifying the wide range of codes used in architectural scale models falls beyond the scope of this paper. Nonetheless, their lack of uniformity and above all their lack of comprehensiveness must be acknowledged. The signification of an architectural scale model's form is just as much subjected to a code as its expression is. Also beyond the scope of this paper is a thorough discussion of the arguments supporting the arbitrariness of the relationship that a scale model has with an architectural object. Nonetheless, it can be emphasised that that arbitrariness is the consequence of the absence of any natural link – i.e., a non-coded relationship – between a representation and the object being represented. A scale model and the architectural object it represents are just as much distinct from each other as they are independent entities of one another, and this is confirmed by the possibility of achieving a reciprocally autonomous comprehension of one from the other. As to the immediacy with which most architectural scale models are usually understood, it must be acknowledged that the interpretation process demanded by scale models is learned early in life, commonly with toys as pointed out by Selenitsch.[27] It becomes such an imperceptible process. The difference between a toy – a small car or a doll, for instance – and an architectural scale model should be sought in the objects being represented and in the reasons calling for said representations, rather than in how representation is accomplished in either case. No equivalent advanced acquaintance with the codes used in architectural drawings, particularly in technical ones, can be identified, resulting in their common lesser immediacy.

Following the foregoing observations, the understanding of an architectural scale model must be considered as involving the control of a certain system of codes. As that control is guaranteed, it will then be possible to interpret an object as a scale model, discerning in it an architectural object. However, still following those observations, the systems of codes that enable such interpretations do not belong to the objects. Objects are submitted to them, thereby becoming meaningful entities. Therefore, considering that objects do not appear before the subject already holding a meaning, with the meaning of an object instead being assigned to it by the subject, and considering also that objects are assigned a meaning insofar as they are coded, if an object is interpreted as a scale model of an architectural object it is because, within a certain context and for a certain purpose, that object was subjected to a system of codes that allows for that interpretation. No object can be taken as intrinsically being an architectural scale model; such signification can never be taken for granted. And that being the case, any object may be constituted as an architectural scale model, for the existence of an architectural scale model is determined by the assumption of a given system of codes, rather than by an intrinsic feature pertaining to that

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27. A. Selenitsch, "Small Real Large," in *Homo Faber: Modelling Architecture* (ed.) M. Burry, M. Ostwald, P. Downton and A. Mina (Melbourne; Sydney: SIAL and the Melbourne Museum; Archadia Press, 2007), 5.

object. The inadequacy of a given object as a scale model of an architectural object must not be mistaken for the impossibility of said object becoming an architectural scale model.

Eco's considerations on the notion of the sign support the acknowledgement of an architectural scale model as a signification conferred to an object and the temporariness of that signification. The observation that a sign is always the result of a conventional correlation between some elements from an expression plane and some elements from a content plane leads Eco to a twofold conclusion: "a) *a sign is not a physical entity*, the physical entity being at most the concrete occurrence of the expressive pertinent element; b) *a sign is not a fixed semiotic entity* but rather the meeting ground for independent elements (coming from two different systems of two different planes and meeting on the basis of a coding correlation.)"[28] Rather, a sign reveals itself as "the provisional result of coding rules which establish *transitory* correlations of elements, each of these elements being entitled to enter – under given coded circumstances – into another correlation and thus form a new sign."[29] There is a thin line between a set of cardboard pieces and an architectural scale model.

Architectural scale models must be acknowledged as objects holding a temporary existence. Signifying certain objects as architectural scale models is circumstantial volition.

Architectural Scale Models' Ambiguity

A degree of ambiguity relating to the architectural scale model's status must be addressed if the signification of an object as an architectural scale model is to be understood. The architectural scale model's three-dimensional existence has once again to be taken into consideration.

The possibility of the relationship that a scale model has with an architectural object being facilitated due to their common three-dimensional existence has already been dispelled. A coded equivalence between the images one and the other are constituted as allows for that relationship – a strictly coded equivalence and therefore also a strictly arbitrary one, it must be reiterated. A movement away from the sphere of architectural representation into the realm of architectural objects seems, however, to be implied by the fact the architectural scale models have such an existence, moreover because the construction dimension that underlies the scale model is readily acknowledged – a rightfully insinuated movement, one could considered. "Of all [...] forms of representation, the model is the only physical, three-dimensional realization of the architect's idea – which, after all, is ultimately intended to be a physical, three-dimensional thing."[30] As Hubert points out, after elaborating on the notion quoted at the beginning of this paper, "[p]erhaps the model concretizes the ontic condition of the project. It exists as desire – in a kind of atopia, if not utopia. It holds out the promise of

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28. U. Eco, *A Theory of Semiotics* (Bloomington: Indiana University Press, 1979), 49.
29. Ibid.
30. K. Moon, *Modeling Messages: The Architect and the Model* (New York: The Monacelli Press, 2005), 11.

inhabitation, even it if does not fully afford it."[31] Architectural scale models' representational condition becomes diffused, if not to say dissolved, therefore a singular status may have to be agreed upon for them. "For the space of the model lies on the border between representation and actuality. Like the frame of a painting, it demarcates a limit between the work and what lies beyond. And like the frame, the model is neither wholly inside nor wholly outside, neither pure representation, nor transcendent object."[32]

Whilst always a latent presence in all architectural scale models, the weaker the intent to realisation a design project is the more evident the dissolution of the scale models' representational condition seems to be. The concretness of a scale model may even emerge as a *quasi*-architectural aspect, as scale models are fequantly chosen as the ultimate embodiment of the architect's work. That is the case of Kazimir Malevich's (1878-1935) 1920s *Arkitectons*, a set of "three-dimensional compositions, rough models of original architectural compositions."[33] With no buildings actually being defined, the *Arkitectons* became the *architectural* concretisation of Malevich's ideas. The same goes for Peter Eisenman's (1932-) axonometric model of 1975 House X, designed for Bloomfield, Michigan, USA, its representational status deliberately being relinquished. Eisenman's understanding of architecture as being self-referential rather than symbolic of man, freed both architecture and the manipulation of the elements which it is constituted of – walls, pillars, beams – from scale specificity, thus making a distinction between architectural objects and architectural scale models irrelevant. A homological relationship between one and the other was advanced, with the model emerging just as much a cornerstone of the architect's thinking as the final objective. "My concern with the model could be understood in two ways. One would be as a representation of ideas (as opposed to of buildings). [...] The second would be the model as an idea in itself, an object as was the case with the House X model. It is not a representation of anything."[34]

The representational condition of the architectural scale model needs, however, further assertion. The meaning of an object has already been established as being determined by the subject whenever they encounter or imagine it. That is how objects acquire an existence. An object may therefore be invested with *architectural* properties and be part of architectural imagery without actually representing an architectural object as Malevich's *Arkitectons* and Eisenman's model for House X do. However, one condition must be emphasised if an object is signified as an architectural scale model: it stands for an architectural object; it replaces it – the term 'architectural object' is used in the broadest sense, encompassing both actual buildings and architectural concepts. Without the replacement element, no architectural scale model as such would be achieved. That is the consequence of being a representation – an architectural

31. Hubert, "The Ruins of Representation," 1981, 17.
32. Ibid.
33. S. Khan-Magomedov, *Pioneers of Soviet Architecture* (New York: Rizzoli, 1987), 63.
34. P. Eisenman, "The Poetics of the Model: Eisenman's Doubt," in *Idea as Model* (ed.) K. Frampton and S. Kolbowski (New York: Institute for Architecture and Urban Studies and Rizzoli International Publications, 1981), 121-122.

representation, in this particular case. This is a defining feature for architectural scale models, no matter the material used to make them or their size; or the purpose they are meant to serve; or even the accuracy and the concreteness with which their object is defined. Even where the expression of a more abstract architectural relationship is the concern, the fact that the scale model's order of magnitude is usually smaller than the architectural object's, reinforces the claim that such a replacement is executed.

An architectural scale model is an object that makes an architectural object present. The image that an architectural scale model is constituted as appears as the image that an architectural object is constituted as; the former is taken as the latter – it allows for a foretatste of it. A relationship between two distinct objects – two reciprocally autonomous objects one of which may even not exist, one must reiterate here – is established whenever an object is perceived as an architectural scale model.

A movement away from the sphere of architectural representation into the realm of the architectural objects is in fact insinuated by architectural scale models by emulating their object with such a singular concreteness. However, no dissolution of the scale model's representational condition can be considered as a result of this. As Hubert points out after identifying the ambiguity of the model's space, "[the model] claims a certain autonomous objecthood, yet this condition is always incomplete. The model is always a model *of*. The desire of the model is to act as a simulacrum of another object, as a surrogate which allows for imaginative occupation."[35]

Insight into the meaning of the 'objecthood' claimed by the model is provided by Fried's 'Art and Objecthood,'[36] and Hubert's reference to this notion is likely based on it. Objecthood is identified by Fried as being embraced by Minimalist Art, or Literalist Art, as Fried prefers to call it, as Minimalist Art claims that its proposals are constituted as single shapes holding no other values than those emerging from experiencing it *in situ* as strict objects – a theatrical experience, as Fried deems it. A new perspective was sought for art, given that painting and sculpture – and Fried gives the examples of Donald Judd (1928-1994) and Robert Morris (1931-) – were confined to an addition of parts, conflicting their hierarchical relations with the whole of the work. Fried questions the results of the Minimalist project, pointing out its apparent inner contradictions. "The shape *is* the object: at any rate, what secures the wholeness of the object is the singleness of the shape. It is, I believe, this emphasis on shape that accounts for the impression, which numerous critics have mentioned, that Judd's and Morris's pieces are *hollow*."[37] 'Art' and 'objecthood' are perceived as being at odds with each other, Minimalist Art being seen by Fried as being anti-ethical to Art, as the reduction of painting and sculpture to the condition of mere objects goes against their own ontological raisons d'être.

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35. Hubert, "The Ruins of Representation," 1981, 17.

36. M. Fried, *Art and Objecthood: Essays and Reviews* (Chicago and London: University of Chicago Press, 1998).

37. Ibid, 151.

Hubert's reference to the 'objecthood' claimed by architectural scale models does not involve a literal interpretation of Fried's understanding of the notion. However, a new horizon for the latter may be envisioned in accordance with the former. No longer is it about acknowledging the ambiguity of the space of the architectural scale model in the movement it insinuates away from the sphere of architectural representation into the realm of the architectural object; with such movement insinuated, it is also about acknowledging the confrontation with the spectrum of the scale model's pointlessness. "The truth of the model does not lie in its referential nature since as simulacrum the model denies the possibilities of its own autonomous objecthood and establishes the building as the ultimate referent, as a reality beyond representation."[38] Architectural scale models are confirmed as belonging to the sphere of architectural representation, despite all efforts to escape it – in the end, the frame goes with the painting...

No use can be found in terms of the envisioning of architecture in an object that is incapable of revealing an architectural object, regardless of whether that architectural object is an actual building or an architectural concept.

Body Challenges

The investigation of the status of the objects – one should bear in mind – made it possible to clarify that, the existence of an object is provided by the subject whenever they signify it, as objects have no intrinsic meaning of their own. To be a specific object is a temporary condition, lasting only as long as that specific meaning is ascribed to it. An object's existence – *its* apparent existence – is always a circumstantial one.

Architectural objects should be understood in accordance with this revision of the status of the objects – with a stricter sense of the term as an actual building now being considered. No object can be acknowledged as being intrinsically an architectural object. The existence of an object as an architectural object is determined by the subject whenever they encounter that object. To be an architectural object is also a temporary condition, no matter how evidently some objects stand as architectural objects. However, one must affirm one feature that distinguishes an architectural object from all other objects: the ability to embrace the subject. "[O]f all the objects of the world, architectural objects do not (only) live in the world *beside us* [as all other objects do]; it is us who live *in them*, not just *beside them*, but also, if not to say, above all, *inside them*."[39] One can discuss the conditions that facilitate such an embrace and what it implies, but only thus, by embracing the subject, by becoming an extension of them and being the frame to their existence, can the existence of an abject as an architectural object be fully consummated, as "[t]he timeless

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38. Hubert, "The Ruins of Representation," 1981, 19.

39. Own translation. Original text: "*de todos os objectos do mundo, os objectos arquitectónicos, não habitam (só)* ao nosso lado *o mundo; somos nós que habitamos* neles*, não somente* ao seu lado*, mas também, senão mesmo sobretudo,* dentro deles." Janeiro, *Origens e Destino da Imagem: Para uma Fenomenologia da Arquitectura Imaginada*, 2010, 15.

task of architecture is to create embodied and lived existential metaphors that concretise and structure our being in the world."[40]

This paper is about objects holding a singularity. It is about objects, one should bear in mind, that by virtue of their size and also the materials they are built with call into question the frontier between the universe of architectural representation and the universe of architectural objects; it is about objects that can become meaningful as architectural scale models just as much as they can as architectural objects. Instead of just being looked at, these objects challenge the body to live inside them, to immerse itself in their interior, to move through it, requiring a reversal of the regular sense of possession established between a scale model and its beholder: no longer is it about an object being possessed by the subject whenever they encounter it, even because the full-model's "presence is remote from any sense of possession: it is not held within us."[41] Rather, it is about the subject being possessed by an object as they let themselves inhabit it, thus seeing it as an extension of the body. "Understanding architectural scale implies the unconscious measuring of the object or the building with one's body, and of projecting one's body scheme into the space in question. We feel pleasure and protection when the body discovers its resonance in space."[42]

Are such objects still architectural representations, or have they crossed a line into the realm of architectural objects? I posed this question at the beginning of this paper. The answer to that question must be sought not in said objects but in how the subject choses to signify them. It is the willingness to assume such objects either as a substitute for an architectural object or as an extension of the body that grants said objects an existence either as an architectural scale model or as an architectural object.

The possibility of those objects becoming either an architectural object or an architectural scale model depends on how the body challenges itself to be embraced by them.

Final Considerations

A few final words on the project for the musealisation of the Islamic residential remains in Praça Nova do Castelo de São Jorge, regarding the play with the boundaries of both architectural object and architectural scale model that confers the design its singularity.

There is indeed a deliberate playing the boundaries of both the architectural object and the architectural scale model in the design, with no clear distinction between one and the other seemingly discernible. However, it is ultimately the confirmation of that distinction rather than the dissolution of it that underlies that play. No matter how appealing the affirmation of a dissolution may seems to be, only the distinction between architectural object and architectural scale

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40. J. Pallasmaa, *The Eyes of the Skin: Architecture and the Senses* (Chichester: John Wiley and Sons, 2012), 76.

41. Moon, *Modeling Messages: The Architect and the Model*, 2005, 73.

42. Pallasmaa, The Eyes of the Skin: Architecture and the Senses, 2012, 71-72.

model provides the appropriate framing for the understanding of the design proposal. The musealisation of the Islamic residential remains is understood alternately either as an architectural object, or as an architectural scale model, not simultaneously as one and the other. Therein lies the singularity of this work by João Luís Carrilho da Graça.

Acknowledgements

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