

On the importance of materials in the Monegros colonisation settlements

Apuntes sobre la importancia del material en la arquitectura de colonización de Los Monegros

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Abstract

Two central elements converge in the heritage values of Spain's colonisation settlements in general and of those in the Los Monegros region in particular: the notion of the single unit and the fusion of modernity and tradition. Materials play an important role in both aspects. This analysis seeks to identify the values in the original projects that are essential in order to recognise colonisation settlements as examples of architectural and urban heritage. The premise of this analysis is that the materials used to build these towns and villages have inherent value and, as such, must be maintained and conserved.

This paper forms part of a larger research framework, a doctoral thesis currently underway, in which the present conditions, degree of conservation and causes of deterioration observed in the colonisation settlements of Los Monegros are being analysed. After a series of general reflections on the architectural heritage of the materials, and after subsequent study of their current condition of the materials, guidelines are proposed for the improvement of their conservation. A series of possible criteria are also set out that can serve as a guide for any interventions to be made to the architectural heritage of these settlements, which are part of the overall history of Spain's agrarian colonisation project.

Keywords

Monegros, colonisation settlements, historical site, modernity and tradition, conservation and intervention.

Resumen

Dos son los elementos fundamentales que confluyen en los valores patrimoniales de los pueblos de colonización en general y de los Monegros en particular: la idea de conjunto unitario y la convergencia entre modernidad y tradición. En ambos aspectos, el material juega un papel significativo. El análisis que aquí se presenta trata de identificar aquellos valores de los proyectos originales que son esenciales para la consideración de los pueblos de colonización como patrimonio arquitectónico y urbano. La tesis de partida es que los materiales empleados en la construcción de estos pueblos constituyen un valor en sí mismo que conviene mantener y preservar.

Esta contribución se enmarca en un trabajo de investigación más amplio, una tesis doctoral en curso, en el que se analiza el estado actual, el grado de conservación y las causas del deterioro que hoy se percibe en los pueblos de colonización de los Monegros. Partiendo de unas reflexiones generales sobre el valor patrimonial de los materiales y el análisis de su estado actual, se proponen algunas pautas para mejorar su conservación. También se avanzan una serie de posibles criterios que pueden servir de orientación a la hora de realizar intervenciones en el patrimonio construido de estos pueblos que forman parte del proyecto global de colonización español.

Palabras clave

Monegros, pueblos de colonización, conjunto histórico, modernidad y tradición, conservación e intervención.

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[Fig. 1]. Map showing the location of the Los Monegros colonisation settlements. Source: Archivo Central Ministerio de Agricultura y Medioambiente, ACMAGRAMA.

Introduction

The colonisation settlements of the Los Monegros region of Aragón are located in the Flumén-Monegros irrigation district, which lies within the Ebro river basin. It was under the control of the Ebro Regional Office, one of six regional offices comprising Spain's National Institute of Colonisation (INC, using its Spanish initials).¹

The Department of Architecture of the Ebro Regional Office was headed by the architect José Borobio Ojeda.² Other architects joined the team to work on the projects. In some cases, designs were commissioned from architects outside the department. The list of the colonisation settlements in los Monegros and their lead architects is as follows (E indicates expansion): Antonio Barbany Bailo: Montesusín, San Juan del Flumen; José Beltrán Navarro: Cantalobos, Cartuja de Monegros; José Borobio Ojeda: San Lorenzo del Flumen (E), Cartuja de Monegros (E), Cantalobos (E), Curbe (E), Sodeto (E), Orillena; Alfonso Buñuel Portoles: San Lorenzo del Flumen; Javier Calvo Lorea: Curbe; F. Hernanz: Frula; Santiago Lagunas: Sodeto.³ [Fig.1]

The INC drew up internal guidelines for the colonisation settlement projects. These guidelines primarily comprised administrative instructions for drafting projects.⁴ For more specific design-related matters, such as the adaptation of the settlements to the topographical features of the terrain, their layout, architectural design and choice of materials, the lead architects were given autonomy to make proposals.⁵

A series of constants can be observed in most of the projects, as identified in a number of earlier studies on colonisation settlements, such as the research conducted by Alfredo Villanueva Paredes and Jesús Leal Maldonado. According to their analysis, these constants can be summarised as explained in the following.

The overall plan of the settlements tended to focus on interrupted perspectives, with a square around which institutional buildings, facilities and commerce were located, and where buildings were grouped to create a continuous mass. The most recent plans evidenced the notion of separating pedestrian transit from that of carts and animals, and the main thoroughfare was generally laid out to provide a vista of

1 Javier Monclús Fraga and Juan Luis Oyón Bañales, *Historia y Evolución de la Colonización Agraria en España. Volumen 1: Políticas y técnicas en la ordenación del espacio rural* (History and Evolution of Agrarian Colonisation in Spain. Volume 1: Policies and techniques for land use planning in the rural space) (Madrid: Secretaría General Técnica (MAPA), Instituto de Estudios de Administración Local (MAP), Instituto de Reforma y Desarrollo Agrario (MAPA), Instituto de Territorio y Urbanismo (MOPU) and Dirección General para la Vivienda y Arquitectura (MOPU), 1988), 136-147.

2 Starting 13 December 1943.

3 Manuel Calzada Pérez, coord., *Pueblos de colonización III: Ebro, Duero Norte y Levante* (Córdoba: Fundación Arquitectura Contemporánea, 2008), 133-135.

4 The texts referred to the documentation required for the projects and to project drafting procedures, as well as detailing the needs to be met by the settlement design programme. The guidelines defined different kinds of settlements depending on their size, detailing the required number and type of dwellings, public buildings and facilities. The documents also included issues relating to the overall planning strategy for colonisation projects, which were debated when the INC was initially established. Among these were how to decide the most suitable type of settlement with a choice between dispersed dwellings

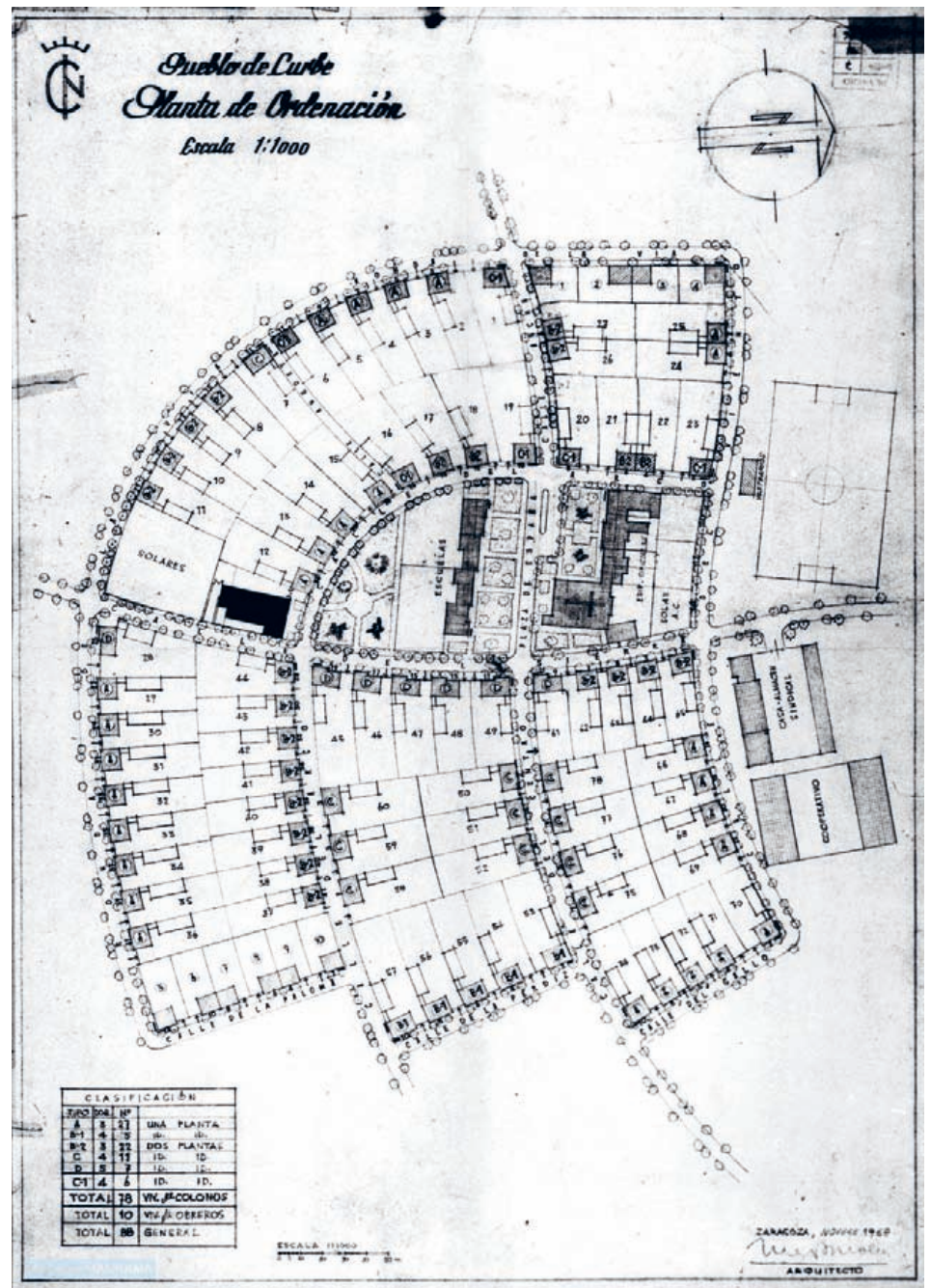
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[Fig.2]. José Borobio Ojeda, Curbe, 1968. General Plan. Source: Eduardo Delgado Orusco, *El agua educada. Imágenes del archivo fotográfico del Instituto Nacional de Colonización (1939-1973)*, vol. 1, *Zona regable regional del Ebro / The educated water. Images from the photographic archive of the National Institute of Colonisation (1939-1973)*, vol. 1, *Ebro regional irrigable zone*. (Madrid: Ministerio de Agricultura, Alimentación y Medio Ambiente, 2013, DVD).



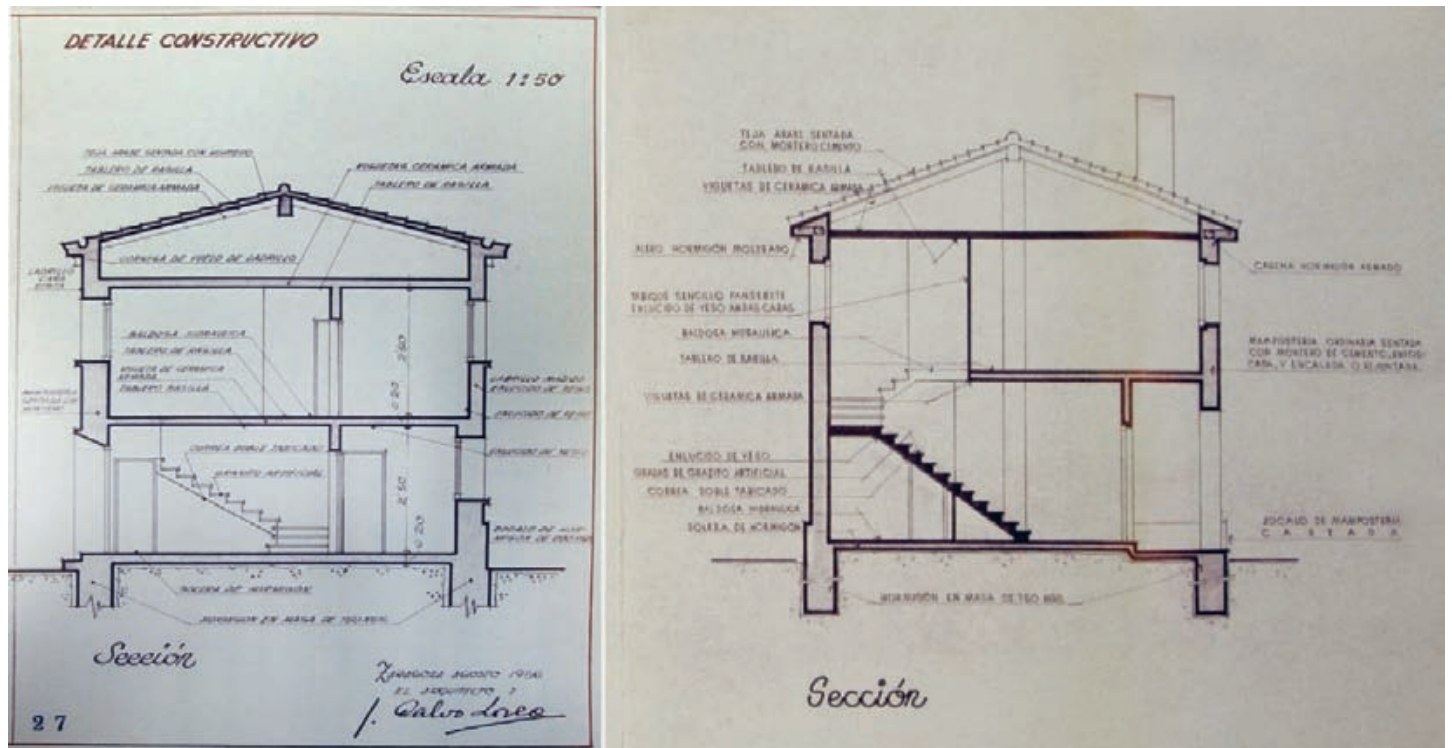
the church tower. There also appeared to be small areas of woodland delimiting the edges of the settlements [Fig.2].

Where buildings were concerned, there appeared to be a special emphasis on churches and their towers, which were understood as the main landmark of the settlement. On the other hand, dwellings were designed along very heterogeneous lines. This diversity allowed the different needs of the inhabitants to be met, while offering the most unique models possible in order to be appealing to their users.⁶

In the case of materials, the aim of the architects was to adapt to local building techniques and materials. This was essentially a matter of economics — given the scarcity of materials at the time — but also to take advantage of the proximity of resources. Most of the colonisation settlements of the Los Monegros region made use of masonry in the local limestone. Where there was no quarry in the vicinity, brick was used, as in the case of Montesús. Roofs were covered with clay barrel tiles, with brick eaves. The structure comprised exterior load-bearing walls of masonry with a central concrete column, reinforced concrete roof beams, with reinforced poured-concrete concrete joists formed between clay blocks [Fig.3].

or a compact urban fabric, how to specify the dimensions of the settlements and plots and how to determine the distance of settlements from agricultural parcels (using the so-called cart module).

- 5 Extract from an interview with Mr Antonio Barbany Bailo in Zaragoza on 9 July 2014.
- 6 Alfredo Villanueva Paredes and Jesús Leal Maldonado, *La planificación del regadío y los pueblos de colonización* (Planning of irrigation and colonisation settlements), Colección Historia y evolución de la colonización agraria en España, vol. III (Madrid: Ministerio de Agricultura, Pesca y Alimentación, Ministerio de Obras Públicas y Urbanismo e Instituto Nacional de Administración Pública, 1990), 41.



[Fig.3]. Constructive section. Curbe and Sode-to. Source: ACMAGRAMA.

The heritage value of materials

The concept of heritage is increasingly considered an open notion that alludes to historical, cultural, landscape-related, urban and architectural values, among others. In the specific case of the colonisation settlements, materials take on a special relevance. They are the focus of this text, whose aim is to verify the current state of the original materials used in these settlements and the weight they have on their upkeep and restoration, with the intention of guaranteeing their preservation as architectural and urban heritage. The objective of this analysis is to offer a basis on which to establish guidelines for conservation and intervention, from the perspective of the materials, on the heritage of colonisation settlements.

There are currently no laws that acknowledge and protect the architectural heritage of colonisation communities in general, or of the Los Monegros colonisation settlements in particular, other than the planning regulations of each municipality. As can be seen in light of some of the interventions carried out, municipal planning regulations have not been as effective as would be desirable to protect and showcase the architectural heritage of the colonisation communities of Los Monegros. In order to specify the architectural and urban values of these localities, in which materials acquire special relevance, we will analyse the architecture of colonisation from two perspectives. The first of these is the perspective of heritage values that result from their consideration as a 'historical unit'. The second is the consideration of the values of composition and form.

Materials in the reflection on conservation areas

In order to analyse the values derived from the consideration of a single unit for preservation, we essentially draw from the provisions of Spanish law and the existing precepts regarding so-called 'historical units' or conservation areas.⁷

The law considers the most important part of historical units to be their urban and architectural structure, and the general characteristics of their environment, in other words, the system of streets, blocks, parcels together with their form of occupation, heights, internal spatial relationships and relationships between empty

7 Spanish Historical Heritage Law (16/1985).

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[Fig.4]. Different buildings giving form to the Plaza Mayor, the main square of Montesúsín, current state. Source: Luis Prieto.

and built space, public and private, which essentially means the architecture of the city.⁸

It is beyond the scope of this work to debate the possibility or suitability of colonisation settlements—in their entirety or individually—being considered historical units or their listing as properties of cultural interest.⁹ Nor does this article aim to analyse which regulation or law is most appropriate to protect the Los Monegros colonisation settlements. Nonetheless, it is our intention to determine what the values are of this specific architectural heritage, particularly those related to the materials used.

Among the values of historical units referred to in the law and existing literature on the subject, those related to urban and architectural structure and environment, and those related to the ‘general characteristics of the environment’ of historical units are the ones where material may have greater impact when taken at face value. In order to study this subject in greater depth, we need to understand the concept of ‘environment’ as an element likely to contain the values that may be considered heritage. At the same time, this concept refers both to the perception of the general atmosphere of the town or village and to its architectural harmony. The concept of ‘environment’ cannot be understood as applying to each individual building, street or square on its own, but to the unit formed by all the architectural elements comprising the colonisation community.

Of the architectural and urban features that define and structure the unit and its environment, materials play an essential role as the unifying element [Fig.4].

A number of authors who have outlined certain common aspects recognised in most colonisation settlements assert that the sense of harmony was achieved by working with continuous masses of buildings¹⁰ [Fig.5]. It is evident that the use of the same material for all the buildings in each colonisation settlement gave them a uniformity and the sense of continuous mass desired by the architects

8 Juan Antonio Fernández Naranjo, “La protección de los pueblos de colonización” (the protection of colonisation settlements), *PH Boletín del Instituto Andaluz de Patrimonio Histórico* 52 (February 2005): 89–92.

9 On this subject, see Víctor Pérez Escolano, “Pueblos de colonización franquista: objetivo patrimonial” (Franco’s colonisation settlements: heritage target), *PH Boletín del Instituto Andaluz del Patrimonio Histórico* 52 (February 2005): 38–42.

10 Villanueva Paredes and Leal Maldonado, *La planificación del regadío*, 41.

[Fig.5]. Frula. Source: Eduardo Delgado Orusco, *El agua educada*.



who designed them. This aspect — material uniformity — would be essential for enhancing the idea of a single unit.

Colour and texture are the properties of material that most contribute to the overall visual perception of uniformity as a continuous mass. This should be borne in mind when analysing the criteria for heritage conservation and intervention from a material aspect. This uniformity also helps to highlight other particularities and elements of the architecture that are of interest in colonisation settlements. Thus, the uniformity of material allows a clearer reading of elements of the urban design, as is the case of setbacks, alignments, heights, building types and street layout, among others, that comprise the public spaces and also determine the environment of the entire settlement. For instance, the set of volumes and voids that give rhythm to and create the alignment of streets would not be understood if the repetition of such volumes were not repeated through the use of the same material, with a homogeneous colour and similar texture [Fig.6].

However, there are other properties in materials — which we perceive ‘haptically’ — which also enhance those values and others inherent to specific types of natural materials.

[Fig.6]. Street in San Juan de Flumen, current state. Source: Luis Prieto.



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Natural materials — stone, brick and wood — allow our vision to penetrate their surface and enable us to become convinced of the veracity of matter. Natural materials express their age, as well as the story of their origins and the history of human use. All matter exists in the continuum of time; the patina of wear adds the enriching experience of time to the materials of construction.¹¹

This is the case of stone, brick and barrel tiles, which were used to build the colonisation settlements of Los Monegros.

Other significant values the building materials used in the colonisation settlements of Los Monegros enabled to be created were the integration of these communities into their environment and the longer life of the buildings. Environment, in the broader sense, is understood to take in the rural landscape, society and culture, and the local building techniques and trades.

Materials at a crossroads between modernity and tradition. The ‘language’ of architecture

In order to analyse the values of colonisation settlements from the perspective of the language of the designed and built architecture, we draw on the architectural thinking of the day and, more specifically, of the architects responsible for the designs.

As is common knowledge, a critical review of the presumptions of the Modernist Movement took place on the international scene at the end of the Second World War. An attempt was made to reconcile the language of orthodox modern architecture with the idea of a less rigid and less formal style of modern architecture linked to nature and place. In 1950s Spain, during the Franco regime’s push for self-sufficiency, Spanish architecture would also again value history. Regionalist tendencies were the most common positions on the local architecture scene, although like in most of Europe, the architects with closer links to the International Style attempted to combine a modern spirit with tradition.¹² Paloma Baranguán explicitly approached the subject when she recognised the convergence between tradition and modernity that can be identified in these settlements, particularly with regard to the threshold of expression between technique and language.¹³

In this sense, as previously mentioned, the use of local materials did not so much respond to the architects’ regionalist or historicist thinking, but instead to a need for rationalisation — for economic reasons — in building material resources and construction techniques. Again, Villanueva Paredes and Leal Maldonado assert, as exemplified by the way materials had been evolving from the construction of the first settlements with adobe to the use of iron and cement. The initial intention of adapting to local construction techniques was mainly due to the scarcity of building materials, which obligated the use of construction techniques that were already considered outdated in the 1950s. Precast concrete construction had been ruled out because of the low quality of the concrete. Moreover, the use of inferior materials, such as wood on roofs, brought with it the need for repairs in the short term.¹⁴

Contrasting with the geometric abstraction and composition of volumes with cubic proportions and topped with pitched roofs, the traditional materials and construction techniques showed evidence of the material composition of these volumes, while structural elements — walls, lintels, window ledges, eaves, etc.— expressively manifested their tectonic nature. In this sense, the volume of the building frequently gave prominence to the perception of the mass of stone and the sturdiness of the structural elements, window sill, door jambs and lintels, etc. [Fig.7].

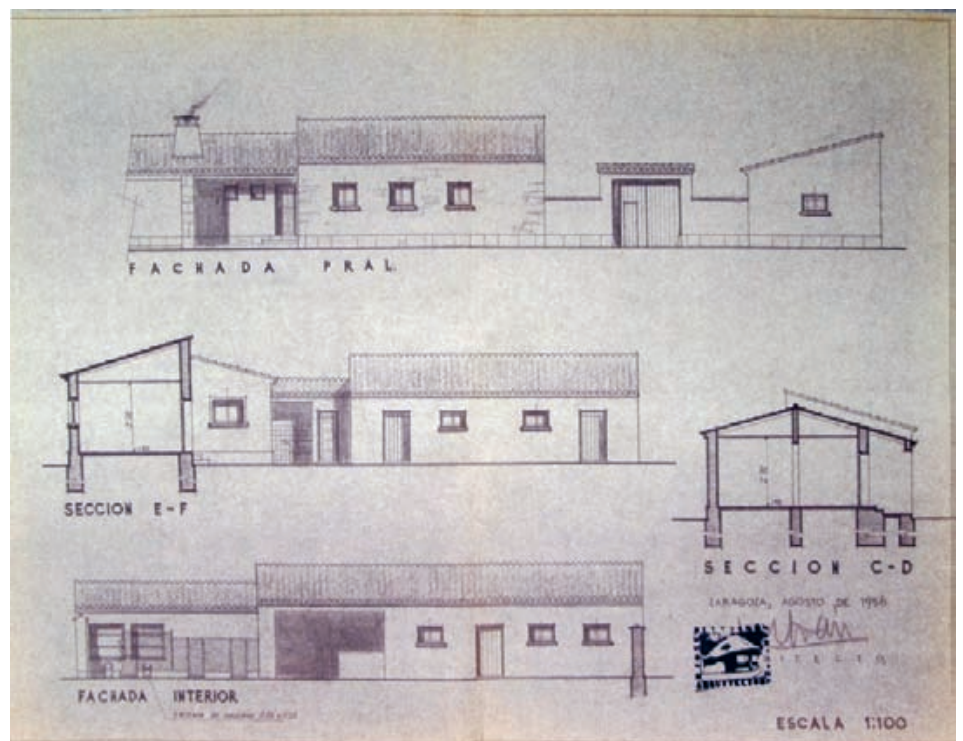
11 Juhani Pallasmaa in *The Eyes of the Skin* makes mention of a haptic architecture that stimulates non-visual perceptions. Hapticity stresses the tactile quality of space, placing materiality and texture over form. Given the hyper-constructed reality that the eye perceives, it is necessary “to re-sensualise architecture through a strengthened sense of materiality, hapticity, texture and weight, density of space and materialised light”. Juhani Pallasmaa, *Los ojos de la piel* (The Eyes of the Skin) (Barcelona: Gustavo Gili, 2006).

12 A number of architects who worked in the INC adopted attitudes closer to rationalism. Among them were the ones who played a major role in the architecture of the second half of the twentieth century in Spain, such as Alejandro de la Sota, Fernández del Amo, Antonio Fernández Alba, José Antonio Corrales, Fernando Terán and José Borobio. On this subject, see Isabel Luque Ceballos et al. (coords.), *Pueblos de colonización durante el franquismo: la arquitectura en la modernización del territorio rural* (Colonisation settlements during the Franco regime: architecture in the modernization of the rural territory) (Sevilla: Junta de Andalucía, Consejería de Cultura, Instituto Andaluz del Patrimonio Histórico, 2008).

13 Paloma Baranguán, 1998. “Poblados de colonización: tradición y modernidad vivienda: técnica y lenguaje de fachadas” (Colonisation settlements: tradition and modernity housing: technique and language of façades), in *Actas del Congreso Internacional “De Roma a Nueva York: itinerarios de la nueva arquitectura española 1950-1965”*, various authors (Pamplona: T6 Ediciones, 1998), 141–153.

14 Villanueva Paredes and Leal Maldonado, *La planificación del regadío*, 43.

[Fig.7]. Housing elevations in Cantalobos.
Source: ACMAGRAMA.



Current state. Conservation and intervention

Recapitulating, the uniformity of the materials used to build the colonisation settlements is an essential aspect that contributes to strengthening the idea of a uniformity and a single unit, and to create the 'environment' that was intended for each unit. On the other hand, the use of natural materials and local building techniques helped to achieve integration of the settlement into its natural and social environment, while producing, with the passing years, a patina that would maintain the original 'environment' of their design, as if history were standing still in the image created by the materials. Stone, brick and tile, together with the use of traditional building techniques, give the buildings a materiality that contrasts with the geometric abstraction of their simple prismatic volumes and convey a symbiosis between tradition and modernity that is characteristic of the time they were designed.

However, maintenance and adaptation interventions carried out in these communities and the deterioration caused by atmospheric conditions have often taken their toll on the original materials, highlighting the fragility of the heritage values in the face of insensitive or negligent actions with regard to the use of materials. The truth is that with the passing of time, the effect of atmospheric conditions on materials and the systems used in construction has caused deterioration augmented by the scarcity of the resources used to construct the buildings [Fig.8]. On the other hand, the new requirements of use, modern standards of comfort and the desire to adapt dwellings to the taste of their owners have notably contributed to the deterioration and the loss of value in colonisation communities [Fig.9]. Therefore, the preservation of an image that is largely associated with materials, which form part of a deliberately expressive modernity, becomes essential.

It should also be pointed out that the government-imposed building controls and regulations have not been as effective as might have been expected. Consequently, the current state of the colonisation settlements reveals the loss of many of the original values of the projects, particularly in relation to materials. The use of different finishing materials such as cement rendering and paint, metal joinery, etc., together with the application of new construction techniques and solutions

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Fig.8]. Buildings in Cartuja, current state and renovated state. Damage caused to stone by moisture can be observed. Source: Luis Prieto.

[Fig.9]. Buildings in Orillena, renovated state and current state. Source: Luis Prieto.

[Fig.10]. Buildings in Cartuja, renovated state and current state. Source: Luis Prieto.

have disrupted the visual harmony of many of the settlements and the architectural language with which they were built. [Fig.10]. This deterioration is not consistent in the different municipalities and the different areas that exist within each of them. Public buildings have suffered less from this type of action than dwellings, where owners have acted at their own discretion. Given this situation, it seems logical to propose guidelines for judicious and realistic intervention in order to preserve these important Spanish heritage assets. The following provides a summary of the approach proposed in the more detailed research work the author of this text is currently conducting within the framework of a doctoral thesis.

Before proposals for conservation and intervention can be made, it is important to set out a route and clear aims that allow criteria and guidelines for work to be established. To begin with, an analysis was conducted into the current state of the studied communities where original values continue to exist and into which of the values lost can realistically be restored. This first step has allowed the identification and recording of the different elements that are capable of being preserved, in terms of the settlement as a single unit and of the its buildings. Next, the analysis and subsequent proposal of criteria for improving conservation and intervention was performed on three levels: on the level of constructive and formal elements, on the level of individual buildings, and on the level of the town or village as a single unit.



[Fig.11]. Buildings in San Juan de Flumen, renovated state and current state. Source: Luis Prieto.

While the constructive and formal elements, together with the treatment given to the volumes define a specific architectural image of the buildings, the repetition of the same or similar solutions contributes to a harmonious image of the single unit, defining its 'environment'. The same occurs with the buildings: they are an expression of architectural language, but the repetition of types and volumes and of their materials helps to determine the image of the single unit. The conservation of the values of settlements as a single unit and of the architectural language with which they were built requires that specific interventions made on buildings upholds the discourse between tradition and modernity. At the same time, it must take place within parameters that allow creative freedom and abstraction, on the one hand, and preservation of the environment and harmony of the single unit, on the other.

Materials are elements that significantly contribute to the upkeep of these values. Uniformity and texture in interventions allow variations in the elements used in construction solutions, formal solutions and volume solutions to be incorporated into the same environment without losing the sense of uniformity of the single unit. The difficulty lies in evaluating up to what point such interventions can comply with this condition without becoming a pastiche. Here is what can be considered the greatest difficulty: regulating sensitivity in interventions by council ordinances.

On the other hand, retaining the same materials and constructive and formal elements cannot in themselves ensure the success of an intervention, despite their contribution. As observed in Figure 11, the image on the right shows how the architectural language is modified despite maintaining the same materials and different solutions for eaves, lintels and canopies over windows and doors.

One route for establishing intervention criteria could be the combination of the application of regulating ordinances with examples given of models and practical cases already carried out. It is important to document and analyse experiences gained in Spain and internationally, not only in colonisation settlements, but also from other examples involving the heritage of modern architecture which, although of a different nature, share a common methodology for action.

Interventions on colonisation settlement heritage can initially be generally and schematically be classified into two main groups. The first group covers those interventions carried out to elements that still maintain original values, which therefore consist of preserving and protecting them. From a material standpoint, the appropriate constructive and formal treatment of original material in these cases is the necessary condition for preserving these values. Although not exempt



[Fig.12]. Main square in Valfonda de Santa Ana, original state. Source: Eduardo Delgado Orusco, *El agua educada*.

from difficulty, the solutions that can be proposed for these types of actions are economically feasible and socially acceptable. The second group comprises interventions made to elements that have lost their values, the challenge being to restore them as far as possible. In some of these cases, again from the material standpoint, the economic and social difficulty in recovering the values of the entire settlement and the architectural language is very high, considering that not only have the values of the earlier building been lost, but the actual building may no longer be there. These types of actions have to be encouraged by the different levels of government themselves, which are in the position to provide the social and economic impetus necessary to make the inhabitants of those localities aware of their suitability and carry them out. There may be a number of different degrees of action in these types of interventions. In the most unfavourable cases, the removal of the most distorting elements from the building and the use of colour and texture may help to integrate those buildings into their surroundings, although not replacing the original values, in such a way that the values that are preserved in other parts of the locality do not become distorted [Fig.12].

Conclusions

The most important values of the colonisation settlements in which materials have special relevance are contained within the notion of the harmonious single unit, and in the example of an architectural language set between tradition and modernity.

In their current state, colonisation settlements are seen to have lost a large part of the original values of their architectural design, in differing degrees and on different levels of the project: on the level of constructive elements and details, on the level of buildings, and on the scale of the town or village as a single unit.

The interventions that have been carried out in those communities, with exceptions, have generally not been appropriate for the preservation or restoration of those values. Planning ordinances and government control have not brought about the desired result for the conservation and promotion of the heritage of colonisation settlements. Control of interventions by means of rules and regulations is not

sufficient to guarantee results for the intervention. They should be accompanied by examples of intervention and conservation ('good practices') in both Spain and internationally, not only in reference to colonisation settlements, but also to other forms of modern and vernacular architecture that share problems and solutions.

Thought must be given to preservation of and intervention on the heritage of colonisation settlements through two possible strategies: intervention to preserve original values in buildings/communities that still retain them, and intervention to restore them, as far as possible, where they have been lost or where insensitive actions have distorted the value of the single unit.

As a final reflection, in addition to establishing the necessary laws and regulations, governments should work to showcase the colonisation settlements to society, more particularly to their own inhabitants, in order to create a favourable impression and to achieve the necessary means to promote the protection and preservation of this important part of Spanish heritage that are colonisation settlements.

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