

Mining Heritage in Portugal: The Challenges of Architectural Research and In-put

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Abstract: Mining heritage in Portugal is an interesting case for architectural assessment and research; not only due to the fact that it is considered a minor architectural heritage in a rural environment compared with other cases of industrial heritage (often in urban settings), but also to the fact that most plans and design pieces of the past interventions that constitute an essential part of understanding the mining settlements and dwellings, are forever lost or expecting to be catalogued. Despite these challenges, the research provided the elements to design a territorial proposal “Cultural Landscape of Alentejo Pyrite” based on three mining sites (Lousal, Aljustrel and S. Domingos- Pomarão) – within the Iberian Pyrite, while conveying a methodological approach for mining landscapes mainly illustrated by the proposal’s theme unit of Lousal.

Keywords: *mining heritage; cultural landscape; architectural heritage*

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0 Introduction

Industrial heritage “encompasses the industrial culture remains that have historic, technological, social, architectural or scientific value (buildings, machineries, workshops, factories, mines and process and refinery places, customs warehouses and general stores, production centres, transmission and usage of energy, transport vehicles and all the structures and infrastructures, as well as places that have developed social activities related to the industry, such as dwellings, religious and educational places)”, as defined

by the International Council on Monuments and Sites and The International Committee for the Conservation of the Industrial Heritage - ICOMOS-TICCIH^{[1][2]}.

This definition implies an important characteristic – the territorial system and its interpretation as such - that it is crucial when researching these particular elements and sites for its preservation. In order to address this idea, it is important to establish the context of the various kinds of strategies.

More often than not, the territorial proposals for the preservation of industrial heritage are based on a museum like process: of the heritage resource in itself (building, machinery, etc.) or the creation of an area museum. They usually are delimited areas with a precise theme devoted to the preservation of the heritage (undervalued or at risk).

In fact, the *in situ* museums (not just industrial) are the first examples, if not the very first of a heritage understood as a territorial proposal. The context of this approach can be of various natures, for example, using the existing heritage resources for an anthropological point of view.

The idea of cultural immersion in a given space with a particular timeframe context was initially explored by the “open air museums”. The paradigmatic model or traditional of this kind of project is based on the recreation of a representative setting, achieved through the allocation of essentially cultural, or more precisely, architectural elements. This kind of procedures related to the mobility of the built heritage is not by itself a novelty. In XIX century in Europe, there are various examples of allocation and the interpretation of cultural elements, namely through the world exhibits. The conceptual genesis of “open air museums” translates in somewhat paradoxical experiences, as the heritage resource suffers a process of direct or indirect

manipulation. For instance, in the case of the open air museum of Arhem (Netherlands) the area contains national cultural elements of various proveniences. There are numerous examples in the UK, such as the Beamish Open Air Museum, the Dunaskin Open Air Museum or the Rhondda Park devoted to the industrial heritage that exist since the 1960s^[3].

In the continuity of the idea of a lived-in situ heritage, there are the experiences promoted by the eco-museums^[4], a concept initiated in France (between the ending of the 1960s and the beginning of the 1970s) and rapidly disseminated all over Europe. Contrary to open-air museums, the eco-museums depend on the relationship with the context and this fact, manifests on its physical structure. According to Davis^[5], spatially, they can vary from singular points (the building as the eco-museum, the “villa” eco-museum, related to the particular design of rural or industrial settlements or even the “umbrella” eco-museum that encloses a theme or homogenous area. They can also function as contiguous and interdependent sub-areas within a defined park area (such as the case of the eco-museum of the Cevènes Park, which is structured by the three rock masses (Mont-Lozène, Causse et Gorges e Cevènes)^[6].

Spatially, the heritage areas can be constitute by a net of museological points, as demonstrated by the Ironbridge Gorge open air museums, in the United Kingdom,^[7] even though the area abides the same theme unit, its performance is due to the connection of the various museums and the LWL Industrie museum, in Germany^[8] – in this case, the idea of a national museum regarding industry – “*westfälisches landesmuseum für industriegkultur*” – defines by an ensemble of eight museums that functions in a network and that have a common theme.

It is also possible to verify situations of the overlapping of an administrative or regional area limits and the theme unit or area, in which the museum elements reflect a clear affirmation of regional identity as it demonstrates Catalonia System of Science and Technical Museum^[9] that contributed to future legal classifications and new preservation mechanisms:” It is only after numerous pioneer efforts that reflected the concept and provided for the proposals of eco-museums and territory-museums in Nordic countries or in France, that laws and programmes appear and their example is extensible to other countries. It was only after the pioneer labour and the extraordinary relevance and originality of the System of Science and Technical

Museum that various initiatives of cultural landscapes valorisation occurred, such as academic input or from the work of local agents, lovers of a territory in which they want to value their heritage, a preoccupation echoed by the recently approved law -*Ley del Paisaje de Cataluña*.”^[10]

1 Mining heritage in portugal: Main context and issues

Even though, industrial heritage is mostly a “bottom-up business struggling in a top-down world”^[11] there can be successful experiences as previously mentioned, mainly if the legal mechanisms are created. Therefore, and usually industrial heritage valorisation is due to local perception and endeavours in order to provide its preservation for present and future generations, which is also valid for the Portuguese scope.

In Portugal, the recognition of industrial heritage as relevant is relatively recent and is mostly due to the introduction in the 1980s of the discipline of Industrial Archaeology^[12]. This particular discipline largely contributed to the local valorisation of mining sites that date from the beginning or mid-19th century, as for example the transformation of Lousal (which will be the focus of this work) in a museum^[13] that intent to replicate the UK museum experiences, previously mentioned.

Historically and comparatively with other European countries like United Kingdom or France, the Portuguese extractive industry has from its genesis an expression as isolated and fragmented as its various natural elements that subside in the territory. However, and in some cases, the completion of the remnants is above all, revealed by its mining identity and the survival of its morphological compositions, as verified by the research.

Nationally, in terms of scale and significance^[14], it is possible to verify that the industrial heritage catalogue emphasis on singular buildings (textile manufactures, amongst others). The social structures, namely the worker’s neighbourhoods, are in Lisbon (for instance the Vila Berta and Grandella neighbourhoods). These elements were selected according to unequivocal criteria of architectural features. In the particular case of the mining heritage, one of the most pungent issues is the high stage of degradation and vandalism that can be verified in most cases. This situation was also reported in the study cases of the proposal^[15]. Therefore, it is not surprising that the remnant heritage of this

particular industrial activity is integrated in models of preservation that emphasize the geological resource for instance, Arouca's *GeoPark* or geological routes as *Roteiro das Minas e Pontos de Interesse Mineiro e Geológico de Portugal* (Mines and Landmarks of Mining and Geological Interest of Portugal), nationally, and locally, *Rota da Pirite* (Pyrite Route)^[16]. From an interdisciplinary point of view, the interpretation in most cases, rests within the framework of industrial archaeology or as a tool for geological mapping (in the consulted archives this fact is even more notorious). The majority of the documents related to the pits and holes are naturally identified; the plans related to the dwellings implantation and evolution, characterization of typologies and equipment as survey data are still unexplored, or simply, disperse and even vanished. Consequently, their rehabilitation is primordially considered from an environmental point of view, and the Portuguese mining sites have been intervened for requalification purposes^[17] and although the built heritage is considered, it is not the main focus.

Despite this, in the above-mentioned cases there are recent legal classification records of the industrial heritage. As it was discovered^[18] in the inventory provided by Sistema de Inventário do Património Arquitectónico^[19] the cases of Aljustrel and Pomarão were at an initial stage of study and registration whereas the actual building of Lousal's *Ciência Viva* is classified as of heritage quality due to mainly the

project of Tinoco's museum. In all cases, with the exception of the São Domingos site, the built ensemble was not considered dignified for that classification (see Table 1) is relevant to highlight that the proposal and consequent classification of São Domingos as an urban ensemble are due to local efforts in this sense. This site is recognized as a regional asset, enunciated by the existing route or by its touristic dimension: industrial tourism can have a significant expression through the rehabilitation, valorization, and promotion of the mining – archaeological heritage existing in the Region; the mines of São Domingos and Aljustrel, framed in the Iberian Pyrite Belt than can make paths/circuits in cooperation with^[Apariz Mine] and^[Lousal/Canal Caveira mines]^[20]. Lousal and São Domingos mines are also described as examples of high potential^[21].

Industrial landscapes, as Choay^[22] stated, are “documents at a regional scale” and as such, related to this activity there are usually other elements of urban design with a regional impact as communication infrastructures, or local impact with residential areas. As documents it can be partial lost, expectant or turn into museums, but they have the potential of being read as a whole, through a systemic reinterpretation of their region.

The mining sites that enclose the proposal have been studied within several disciplinary scopes: social and historical^[23], museological^[24], archaeological^[25], sociological^[26-28], geological^[29] and environmental^[30].

Table 1. Proposal: Sites classification (source: Oliveira, 2015)

Sites	Register/status dates	Reference SIPA, 2013	Classification and studies related to the industrial heritage
Lousal mine	2006	IPA.00025040	Stage 2: property or ensemble of typological, stylistic and historic value or that is singular within the built environment, in which the structural elements and characteristics of architectural quality or historic significance should be preserved. The exceptions to this particular group are the objects classified as of Public Interest as the Market.
Aljustrel mine	2008, on-going study	IPA.00026975	Stage 6: register of elementary pre-inventory, merely indicative, where it is only registered the elements related to the registered object, as the location, designation, and type of usage. A partial study that does not include the mining neighbourhoods.
S. Domingos mine	2010, 2013	IPA.00016806	The urban ensemble of S. Domingos classified as an Ensemble of Public Interest in 2013. Other equipment as the playfield, post office, cine-theatre and church currently in study. (The mine in itself is classified as of archaeological heritage).
Pomarão	2012, both in study	IPA.0000955	Stage 6: register of elementary pre-inventory, merely indicative, where it is only registered the elements related to the registered object, as the location, designation, and type of usage.

In terms of architectural and urban systematization, the only research (date of this present essay) was about the São Domingos Mines, that as also a municipal Safeguard Plan^[31]. On the other hand, it is recognized the emergence of multidisciplinary research on industrial heritage and on these particular mining sites their value as a system is still to be materialized, despite the references, already mentioned to the territorial potential of these sites. The existing strategies can be synthesized in two approaches: architectural rehabilitation for tourism purposes (the mining site as a museum, similar to the experiences, previously mentioned) and environmental interventions.

The case of Lousal is paradigmatic of both these assessments and therefore will be further dissected.

2 Materials and methods

The proposal of “Cultural Landscape of Alentejo Pyrite” is based on three mining sites (Lousal, Aljustrel and S.Domingos) that include four units – Lousal, Aljustrel, S.Domingos and Pomarão (respectively 1, 2, 3 and 4 in figure 1) – within the Iberian Pyrite Belt (also see figure 1), a geological region that has a length of 250 km and a width between 30 to 60 km approximately, from the north of Grândola, Portugal to nearby Seville, Spain. Despite the existence of this common geological “cord” – which was defined by the research as “non- apparent structured area” related to natural conditioning elements, that as the name indicates are not visible to the naked eye and yet influenced the design, amongst others of different types of territorial proposals as studied, there are other common factors between the mining sites such as their collective memory and identity^[32].

The Cultural Landscape of Alentejo Pyrite research and proposal was structured in three aspects of distinct and general nature:

1) Descriptive: Integrated the elements of general context – mining sites' problematic, a common territorial identity, morphological analysis with the general characterization of the existing administrative/protected areas and geographic delimitations. Particularly, each site was also characterized by the same method previously mentioned. Each case has its own known historic and social framework. A chronological diagram was designed divided into two moments: the period that corresponds to the lifecycle of the mine, that in the case of Aljustrel, including a reopening and the beginning of what was defined as a process of rehabilitation and/or of local revitalization^[33]. It is represents the following elements, common historic events (national and international) with direct or indirect impact on the evolution and function of the mines and the specific chronology of the main events related to each case study. This was relevant to address the following stage of morphological analysis as its statement aided with description. For instance, it was verified that both in Lousal and São Domingos, occurred a similar process of revitalization based on a partnership between municipalities, mining and concessionary companies and the population (although with different levels of successful dialogue between the interested participants. In the case of Aljustrel, there is not an idea of a territory museum, there are dispersed buildings that function as museums; the rehabilitation process occurs on the level of eventual donation of the mining company to the worker's neighborhoods allotment);

2) Interpretative: Constructed a morphological synthesis and the composition of singular elements and common traces between the study cases. The data was obtained from the drawings of the evolutionary framework (existing drawings then transformed to digital graphics content) when possible (as already mentioned related to the incompleteness) state of the

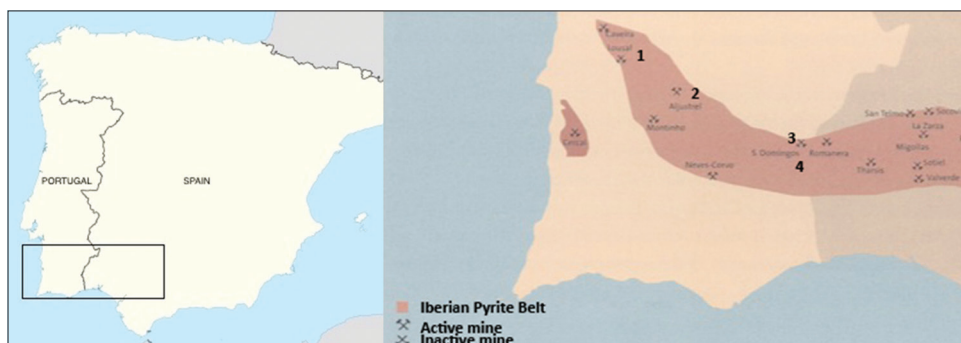


Figure 1. Iberian Peninsula and Iberian Pyrite Belt: location of the all mining sites and the four units of the proposal highlighted (source: Google images and Oliveira, 2015)

physical industrial structures, the existing graphics data presents an equal measure of difficulties. Most of the information is forever lost, such as in S.Domingos due to a fire or is still expecting to be cataloged in the case of Lousal. But when possible, it was addressed issues such as: spatial usage and composition, the different existing structures, such as spatial and building use, roads, paths (formal, pavement accesses or designed in the ground by current usage), public spaces and green events (formal, such as gardens, non formal, such as avulse land appropriation to cultivation or shed purposes). This was done in order to provide the overall context for the proposal. It is currently said that the finished research did not include possible satellite sites associated with the mining activity or even the Spanish sites. It was also studied the modular composition of the mining workers dwelling in order to verify possible similarities or differences amongst the sites.

Therefore, the methodology approach was both analytical and synthetic, based on the units, geographic, urban and heritage contexts and their translation into morphologic contents, the language of architectural research, which was both a difficulty and novelty. Relatively to the territorial narrative, as it is possible to remark the theme units are coincidental with the existing mining sites, but this was only possible to achieve due to the data survey. Nevertheless common traced elements were found, each site represents a specific spatial composition, for instance, Lousal is linear and dispersive^[34] (figures 2 and 3).

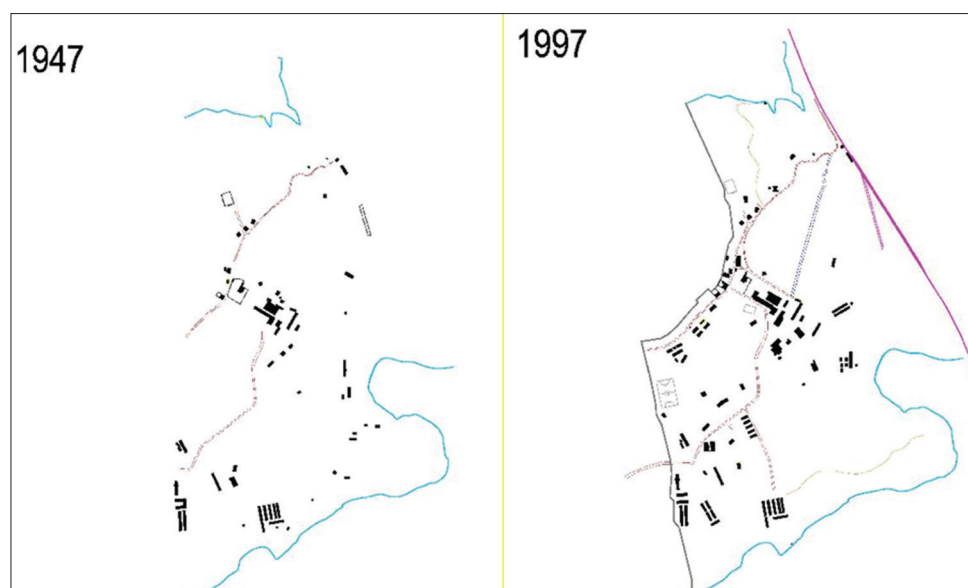
In the case of Lousal, the neighborhoods (figures 4 and 5) created for the various hierarchies of workers

from the mine have a particular research emphasis and systematization, due to their significance within the constitution and evolution of these agglomerates. For certain cases, it was possible to establish specific modifications such as demolitions (figures 6 and 7) or introduction of buildings with a different height (figures 8 and 9) from which the original or more ancient records provide that there were recuperated for and by the research.

Another part of the research was about the mining dwelling's composition. In order to understand the scale, spatial organization, and therefore evaluates its modular composition (figure 10 and 11). This is an integrant part of the systematization that provided for the context of the "Cultural Landscape of the Alentejo Pyrite".

It was also defined the referential elements and of interpretative reading, significant for the territorial comprehension of the particular site and as a part of the valorisation of a more extensive territorial reading. In the specific case of Lousal, local initiatives such as RELOUSAL (a rehabilitation project for the site's dwellings) maintain their essence alive or the "Ciência Viva" center, although its geological essence can provide the infrastructure to an additional input regarding these mining agglomerates. For this reason and despite the fact that chronologically it is the more recent as an active mine, Lousal constitutes the beginning of the proposed narrative. This is an important phase of the proposal, as it will function as a door^[35] for its territorial understanding.

3) Propositional: Expressing the proposal's essence with operative intents (regional, national and Iberian).



Figures 2 and 3. Lousal's evolution: 1947 and 1997 (source: Marta Duarte Oliveira from the graphic data consulted at the SAPEC Archives)

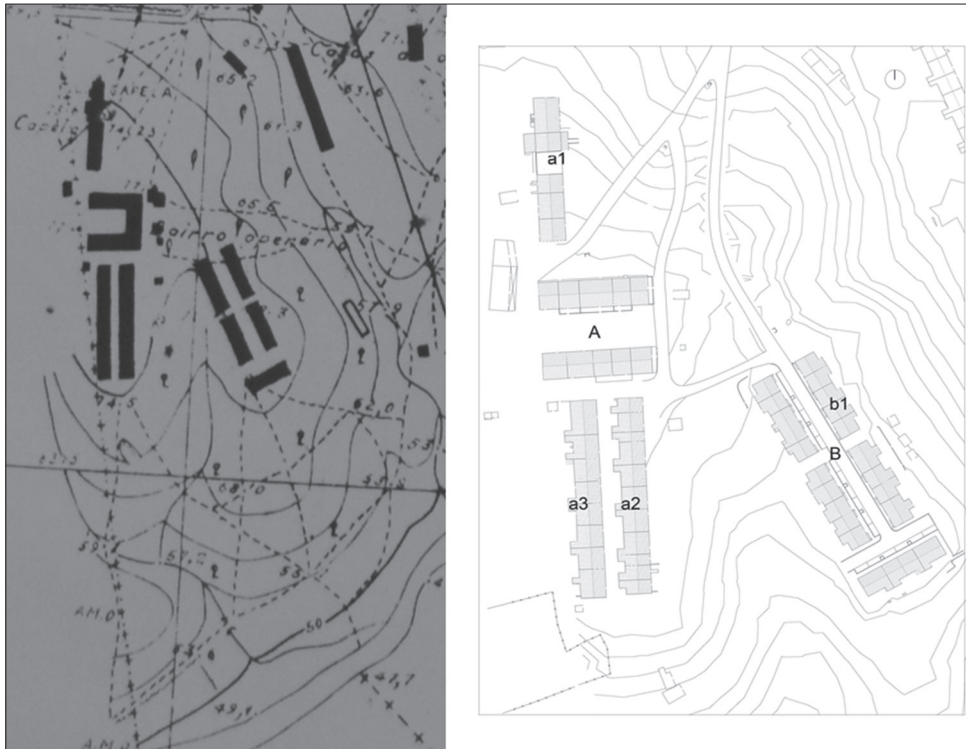


Figure 4 and 5. Direção (A) and Santiago (B) neighborhoods plan (past and actual, both without date) (source: from digital base, granted by GTG and SAPEC archive)



Figure 6 and 7. In the 1950s, a former church/chapel located between two residential buildings and nowadays it is inexistent. (source: respectively, Américo Ribeiro photographic archive^[8] and Marta Duarte Oliveira 2013)



Figure 8 and 9. In the 1950s, a former church/chapel located between two residential buildings and nowadays it is inexistent. (source: respectively, Américo Ribeiro photographic archive^[8] and Marta Duarte Oliveira 2013)



Figure 10. Buildings labelled as a3 in figure 5 (Source: Marta Duarte Oliveira, from SAPEC Archives)

From the established elements, the idea for the region is to create a brand as well as a plan for the region. Presently, it is being designed the proposal “Industrial Heritage & Memory: the Heritage Park of Iberian Pyrite” that encloses all these possibilities and consequently the cooperation with Spain.

3 Results and discussion

The collaboration with Lousal’s Ciência Viva and the GTG (the local office regarding architecture and Urban Planning in Grândola) allowed the recovery of graphic elements, their translation on a digital basis and their interpretation. Similar to this research, this in itself does not represent a methodological novelty. However, in the case of this specific work, the treatment performed was unheard of both in Lousal (as well as in Aljustrel). The reasons are due to the fact that the graphic material was not easily available (the SAPEC file archive in Lousal

was and is in full organization) as well as to substantiate the disciplinary perspective of architecture and urbanism, when others have played a more prominent role in mining landscapes research.

It should be noted that industrial heritage has voice out, acknowledge these other disciplinary areas. However, since it is also a matter of built heritage, it was intended to fill this vacant research space in order to participate in the interdisciplinary debate associated with mining landscapes. The participation of the research findings (the single one provided by an architect) in a colloquium organized by industrial archeologists in 2015, discussed the issues very well ^[36]. In the same colloquium, the conclusions are still valid and coincidental with the current work to address the Portuguese industrial heritage issues today (desirably, interdisciplinary approaches), associations, management and society^[37].

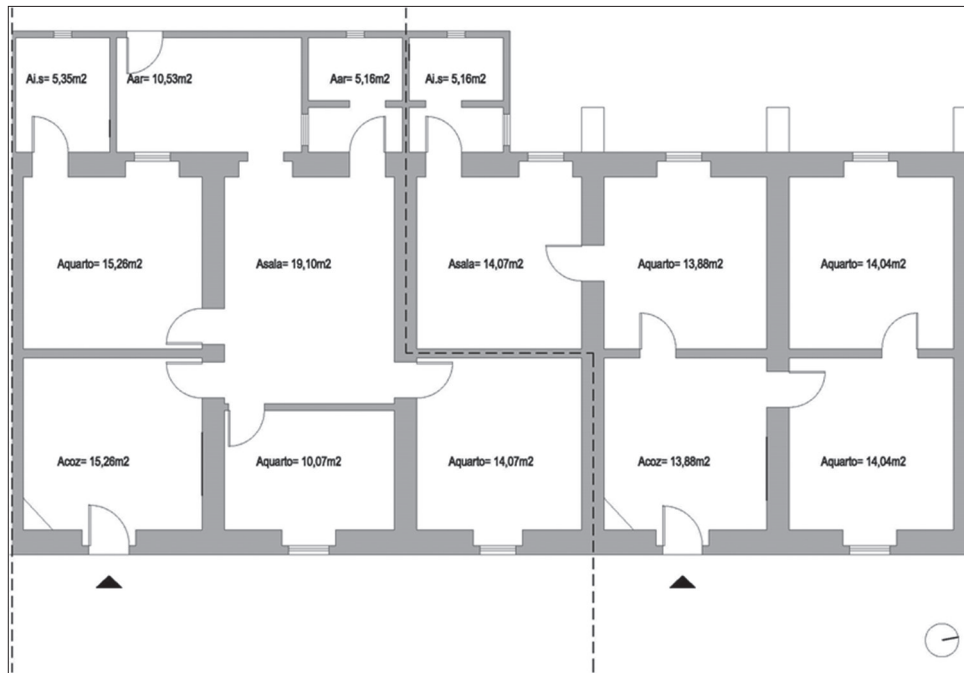


Figure 11. Buildings labelled as a3 in figure 5, as they currently are. (source: Marta Duarte Oliveira from digital base granted by GTG-CMG, 2013)

4 Conclusion

As in international projects of industrial landscapes revalorization, Academia plays a key role. One of the objectives of this research is to provide a stepping-stone for the awareness and its execution in this field.

In the particular case of mining landscapes, to provide and convey a territorial narrative and context supported by morphology analysis, beyond the existing contributes of other disciplinary scopes.

Given the congregation of the elements mentioned above, the perspectives of future work and consequent opportunities are as followed:

The promotion of participative debate regarding Cultural Landscape with the different participants, locally, regionally and even nationally. It has broader implications making possible to considerate the concept and the consequent proposals, their elaboration, and respective institutional framework. In the particular case of the proposal of Cultural Landscape of Alentejo Pyrite, it facilitates its divulgation through a body of work and foresees its affirmation through the participation of the considered municipalities and mining companies as well as the local population for its real concretization. It is an opportunity for the local populations and participant entities to work as “grassroots” for the potential investment and respective economic return. The relation with the Centro de Ciência Viva do Lousal, strategically seizes its existence establishing this mining site as the

one to frame and make the introduction to the creation of the territorial narrative;

This research concerns morphological analysis, due to the disciplinary field in which it occurs, so the methodological proposal should not be read as a finished task. It provides for the basis of an eventual inter-municipality plan (the existing planning tool compatible with what is intended). The local communities, the interested municipalities and concessionary companies of each site, constitute a value system provided by the common cord of understanding, through a proposal’s conceptualization and methodology and fieldwork contacts. It also could be, articulated with this inter-municipality plan and respective management plan, the existing Municipal Plans of the involved municipalities; and in the case of S. Domingos/Pomarão incorporate the Safeguard Plan in this strategy. In the case of Aljustrel, this vision considers the fact that it is still an active mining site;

The opportunity to establish a network with other mining sites (nationally and internationally) through a deeper insight of the survey and analysis of the neighbourhood mining and dwellings. According to the work done related to the primary four mining sites that enclose the proposal, study the existing space of eventual satellite sites in the region and eventual mining sites, from an Iberian understanding of the territory, with the narrative’s common cord originated

physically by the Iberian Pyrite Belt, grounded by the systematization and classification premises provided by the present research.

Therefore, the present proposal “Industrial Heritage & Memory: The Heritage Park of Iberian Pyrite” will continue the systematization work already done aiming for an international scope while creating a logo and a territorial brand, and respective design plans.

Despite the availability of each and one of the contacted entities to access their archives, the existing data state reveals an obstacle that could not be surpassed by the fulfilment of this research’s main objective. The scarceness of information due to several reasons or to the lack of adequate listing was a transversal reality for all the mining sites. This includes the fact that mining dwellings and buildings plans are still not considered as of significance, and if this does not change or is rapidly addressed, many of the data will be lost forever. This research study enables rescuing some of these elements from obscurity, given that many of these data were incognito or unknown, not just to the public. Considering the analysis scope followed by this research, it is confirmed the potential use of these data in the intervention within the mining landscapes, on areas beyond the strictly environmental or as mere testimonies. Furthermore, it is needed to reclaim this legacy to the disciplinary domains of architecture and urban planning in the search and definition of contexts through design, essential for territories museum or still functional and active mining sites. The proposal’s context was only possible by the morphological support and its comprehension arose from the inventory of the graphical information existing and its possibility for inclusion in the research.

This enunciated research gives some direction point of the achievable paths for short/medium-term and does not intend to be exhaustive or to fully drain the theme to its core. There are surely more contributes that can be effectively translated in the territorial proposal of these mining sites and consequently, in the improvement of the Portuguese Territorial planning and organization. Above all, the research is based on the fact that industrial heritage is a valid territorial and strategic resource, whether latent or manifest.

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