

## Digital Documentation as a tool for enhancing the value of dispersed defensive architecture in the Valencian geography

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How to cite: Sáez Riquelme, B., Cabeza González, M. & Soler Estrella, A. (2024). Digital Documentation as a tool for enhancing the value of dispersed defensive architecture in the Valencian geography. In *International Congress proceedings: International Congress for Heritage Digital Technologies and Tourism Management HEDIT 2024*. June 20<sup>th</sup> - 21<sup>st</sup>, 2024. Valencia, Spain. <https://doi.org/10.4995/HEDIT2024.2024.18100>

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### Abstract

*The small towns in the inland regions of Castellón boast a rich architectural heritage and remarkable natural surroundings. Much of this heritage is scattered throughout the Castellón mountains as a tangible witness to the Spanish Civil War. These are kilometres of trenches, and countless defensive elements traverse this landscape, seamlessly integrated into its history. This architecture has been gradually rescued from oblivion since it was included as part of the historical and cultural heritage in Valencian legislation in 2017. Its constructions hold significant value as part of our historical memory and from the perspective of military architecture. Therefore, their formal and constructive analysis provides indispensable information for their comprehensive understanding, conservation, and transformation into a tourist resource. This paper presents the results of studies conducted in the inland municipalities of Castellón through which the XYZ defensive line runs, traversing the province from east to west. In addition to compiling the necessary documentation of this heritage, the aim is to provide the small towns where it is located with tools to leverage this heritage to boost cultural tourism.*

**Keywords:** XYZ Line, trenches, civil war, Castellón, rural tourism, architectural heritage.

## 1. Introduction

In recent years, there has been a growing emphasis on a 'new' form of tourism linked to recent historical memory, particularly spaces directly associated with armed conflicts. This is evident in the case of the Spanish Civil War, which led to the creation of numerous defensive infrastructures. After over eighty years, remnants of these structures can still be found throughout the country, seamlessly integrated into the landscape.

Architectural heritage is a symbol of history and a potential tourism resource. One of the driving forces behind tourism has always been the knowledge of different cultures, with a particular interest in landscapes and architecture, leading to what is known as cultural tourism. Properly managed, it is an opportunity to enhance the culture and heritage of a community, as well as contribute to local development, and should be considered among the strategies that enable the progress of a territory.

The new interests of visitors allow for the expansion of the tourism offer. One of the emerging trends is the development of tourist routes, which are created by visiting different places connected by a common theme. The heritage of the Civil War, properly located and signposted, can be part of this cultural itinerary. (González et al., 2022)



**Figure 1.** Cultural Tourism, Viver. Source: own work (2019).

In the Valencian Community, these constructions were officially recognised starting from the year 2017, with the approval of the modification of the Valencian Cultural Heritage Law (Law 9/2017, of April 7, of the Generalitat, modifying Law 4/1998 of the Valencian Cultural Heritage), according to which all military constructions built during the conflict became part of the local heritage of Valencian municipalities.

In fact, the approval of Law 16/1985 of June 25 on Spanish Historical Heritage marked the first official protection for historical sites in Spain, defining them as areas with historical, cultural, or natural significance. This law delegated protection responsibilities to municipalities, requiring them to draft special protection plans or other planning instruments.



Thirteen years later, the Valencian Government adopted Law 4/1998, of June 11, on Valencian Cultural Heritage, mirroring the state law emphasising the protection of historical sites and introducing the 'Local Relevance Real Estate' concept. This concept was further expanded by Law 5/2007, of February 9, of the Valencian Government, categorising these assets into monuments, historic gardens, and archaeological protection areas.

To streamline municipal actions, DECREE 62/2011, of May 20, of the Consell, was approved, regulating the declaration and protection of local relevant assets. It defined Historical Sites of local interest as places with significant value for popular memory.

Lastly, Law 9/2017, of April 7, of the Generalitat explicitly recognised civil and military constructions from the Civil War, amending and expanding the categories of architectural elements considered local relevance assets. This law also initiated a specific inventory of these heritage assets, including detailed records of the constructions related to the XYZ Line.

Since then, various municipal initiatives have emerged to recover and enhance this type of heritage. On the one hand, it aids in understanding a unique historical moment. On the other hand, it increases cultural offerings and the possibility of visits and activities in lesser-known and often sparsely populated areas. In the context of the province of Castellón, 89 out of its 135 municipalities have fewer than 1,000 inhabitants, 115 have fewer than 5,000, and in 43 municipalities, the population density is below ten inhabitants/km<sup>2</sup> (INE, 2019), with many facing significant depopulation challenges.



**Figure 2.** Bunker, Viver. Source: own work (2019).

## **2. Aims and objectives**

The objective falls within the realm of architectural heritage studies. In this case, it aims to enhance the value of poorly studied military construction remnants scattered in a mountainous environment. Starting from historical studies, documentation is generated, primarily of a graphic and constructive nature, as a contribution to their understanding.

### **3. Methodology**

The methodology follows a sequence of steps, beginning with the search for existing information, locating existing military remnants, and determining those to be studied in depth. Conversely, data collection 'in situ' is carried out for subsequent graphic representation and constructive study.

#### **3.1. The historical context. The XYZ or Matallana defensive line**

The Battle of Levante was crucial in developing the Spanish Civil War. Unlike other fronts, the Republican faction conceived the Levante front as a defensive strategy to halt the advance of the rebel troops towards Valencia, the then-capital of the Republic and the main supply port for Madrid.

This was achieved by constructing a defensive network of three lines deployed along the Castellón mountain range. Among them, the XYZ Line, also known as the Matallana Line in honour of the Republican Colonel Manuel Matallana Gómez, stands out for its extent and strategic value during the war.

After the Aragon offensive in March 1938, with which the rebel army managed to reach the Mediterranean and to prevent the rebel troops from breaking through this defensive line, as had happened on other fronts, 14 Resistance Centers were established as key points, distributed throughout the province of Castellón, from the mountains north of Almenara to Santa Cruz de Moya in the province of Cuenca. (Military General Archive of Ávila)

In addition to these main centres, secondary support points were constructed to ensure defensive continuity, supporting the main centres and allowing the withdrawal of troops in case of enemy penetration. The new defensive structure had a depth design, with resistance points at the forefront and rear of the main line, separated by 2 to 6 km. (Galdón, 2011)

As the conflict continued, the defensive system was expanded with new resistance centres built by the rebel faction. In total, these fortifications occupied a swath of land 10 to 15 km wide in the areas of greatest combat, extending along 150 km with trenches, bunkers, and various structures, constituting the largest fortified line in the history of Spain. In total, the XYZ Line passes through 46 municipalities, of which 40 are located in three regions of the province of Castellón: 3 in Alto Mijares, 14 in Plana Baixa, and 23 in Alto Palancia. (De Manuel & Gil, 2018).

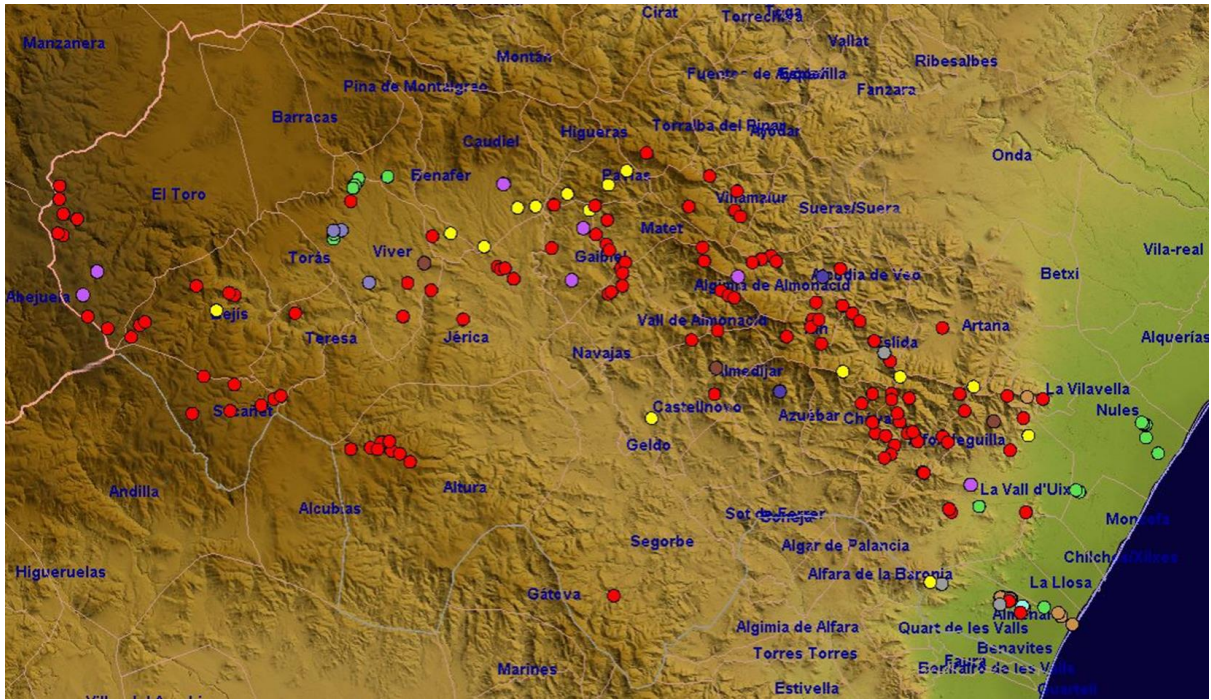
#### **3.2. List and location of elements**

After the Spanish Civil War ended, many of the defensive infrastructures were forgotten and, over time, disappeared. However, the resilient materials used in their construction have allowed numerous remnants to be preserved more than 80 years after their creation, becoming part of the landscape and blending with it.

The valuable information collected in the regional inventories, organised by municipalities and regions, is complemented and updated with data provided by the localities themselves in their dissemination efforts and by numerous associations dedicated to preserving this historical heritage. Many of these associations have been active since before the approval of Law 9/2017 and have played a crucial role in locating and preserving this historical legacy.

The result is a list of the 40 municipalities in Castellón through which the XYZ Line runs. This list includes the elements inventoried by the Valencian Government, those catalogued by local municipalities, and additional information provided by nonprofit associations, thus enriching the overall understanding of the ensemble.





**Figure 3.** Location of local interest assets along the XYZ Line inventoried by the Valencian Government  
Source: Based on the Cartographic Viewer of the Valencian Government (2020).

The research has allowed the identification of a variety of elements, such as trenches, parapets, shelters (both anti-aircraft and natural), fortified positions, machine gun nests, observation posts, bunkers, forts, sniper posts, fortified warehouses, command posts, airfields, funerary monuments, and national camps, among other military constructions. These elements are distributed across 33 municipalities in the province, primarily concentrated in the regions of Plana Baixa and Alto Palancia, although they are also found in Alto Mijares. (Cabeza et al., 2020).

### 3.3. Data collection and preparation of graphic documentation

To accurately document the state of these constructions, it is essential to perform on-site data collection. In planning the work, it was necessary to consider the difficulty of accessing many elements to be studied.

With the previously gathered information, we could expedite the location of various remnants, prepare the necessary equipment, and establish routes to optimise fieldwork. We used traditional direct measurement systems supplemented by photogrammetry techniques for on-site data collection.

In cases where the simplicity of the forms and the accessibility of the element allowed it, measurements and data collection were conducted directly on-site, supplementing the information with detailed photographs. In situations where the irregular shape of the element hindered precise data collection, photogrammetry allowed for accurate dimensions and shapes of the most complex surfaces to be obtained, such as in the case of elements excavated in the terrain and, in addition, to enable the creation of a high-resolution virtual model which provide not only geometric data but also surface details. This data enhances the elevations with orthographic images and facilitates the creation of virtual reconstructions and interactive tours of the shelter interiors.

This data collection has enabled the preparation of graphic documentation through its plans and sections, which provide insight into its configuration and dimensions. Furthermore, georeferencing has been carried out, and in the case of urban shelters, this data can be exported for integration into broader Geographic Information Systems, such as the one provided at the regional level by the Institut Cartogràfic Valencià of the Generalitat Valenciana (Cabeza et al., 2023).

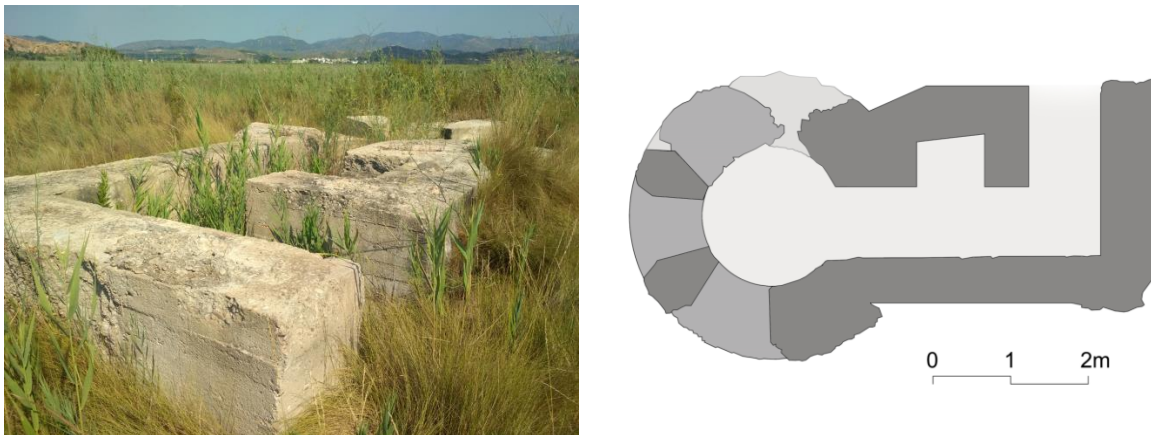
#### 4. Results

From the procedure described above, we have gained insight into a significant sample of these defensive architectures, whose execution was determined by their location, sometimes to take advantage of the terrain and other times to obtain the material to build these structures.

To illustrate the work, below is a series of military constructions corresponding to Resistance Center Number 1 of the XYZ defensive line, Almenara-La Llosa (Cabeza et al., 2021). Through the preparation of scale drawings, the architecture has been defined.

The graphic representation of the studied elements was carried out by directly transferring the obtained information and elaborating on the corresponding orthographic views. Due to the poor condition of most of the remains, the focus has been on developing plans, and in the case of better-preserved elements, sections are provided. Given the irregularity of the study models, shading has been used as a graphic resource to intuitively express the depth of the different planes on which the element surfaces are located. The result can be appreciated in the four models presented below, selected as a representative sample of the different typologies studied.

An example is these two pillboxes located on a marsh near the coast, built on an approximately circular concrete platform of about 300 m<sup>2</sup>. Both pillboxes have similar characteristics and are in the same state of preservation, with only the lower part of the concrete walls that originally supported the roof. The plan has a keyhole shape, with the casemate located at the circular end featuring three embrasures, accessed indirectly from the other end through an L-shaped passage. Between the two ends, near the entrance, there is a hole in one of the walls used as a storage area. With a total length of just over 6.5 meters and a maximum width of 3.7 meters, the thickness of the walls varies from 60 cm at the entrance to over 100 cm at the embrasures.



**Figure 4 - 5.** Located on a marsh near the coast. Source: own work (2020).

An opposite case is this other pillbox, called a mine type. Partially excavated in the terrain itself, externally, it appears as just another rocky mound in the mountain, barely recognisable by the openings that form its four embrasures, one of them sealed. The irregularity of the large interior space follows a curved guideline along which the embrasures are serially arranged, distinguishing two areas, one on each side of the entrance, with the one oriented to the east being larger. Its access is through the top, vertically through a rectangular hole measuring 60 x 80 cm. At its bottom, this prior space communicates laterally with the eastern end of the main cavity. The rest of the sides are formed by the terrain itself and a concrete wall supporting the roof. The free height inside the main cavity reaches 180 cm in certain areas, although, in most areas, it does not exceed 160 cm.





**Figure 6 - 7.** Pillbox mine-type. Source: own work (2020).

Halfway between the previous ones, the next bunker has characteristics similar to the first but in mountainous terrain. It is better preserved and shows part of the roof, corresponding to the access corridor to the casemate with a free height of less than 180 centimeters. It is a vaulted roof finished on the outside with local stones dropped, aiming to camouflage the presence of the bunker from the sky. In this case, the casemate is semicircular with a radius of 2 meters inside and has four embrasures. The access to it also occurs through an L-shaped corridor, which in this case is slightly sloped towards the casemate and is approximately half the length of the previous bunker. The thickness of the walls also varies from one end to the other, showing the same dimensions as the previous example, 60 cm at the entrance and over 100 cm in the curved wall enclosing the casemate.



**Figure 8 - 9.** Bunker in mountainous terrain. Source: own work (2020).

The last drawing corresponds to an observatory at the top of a hill. It is built with stone walls reinforced with cement mortar, using remnants of the fortification that runs along this hill's southern slope and is embedded in the old wall. It is a buried rectangular enclosure without any covering, approximately 2 meters long, 1 meter wide, and 1.2 meters high. The access is through the usual L-shaped passage. Its north front is topped with a large embrasure, while the side wall to the east has a storage area embedded within the wall itself.

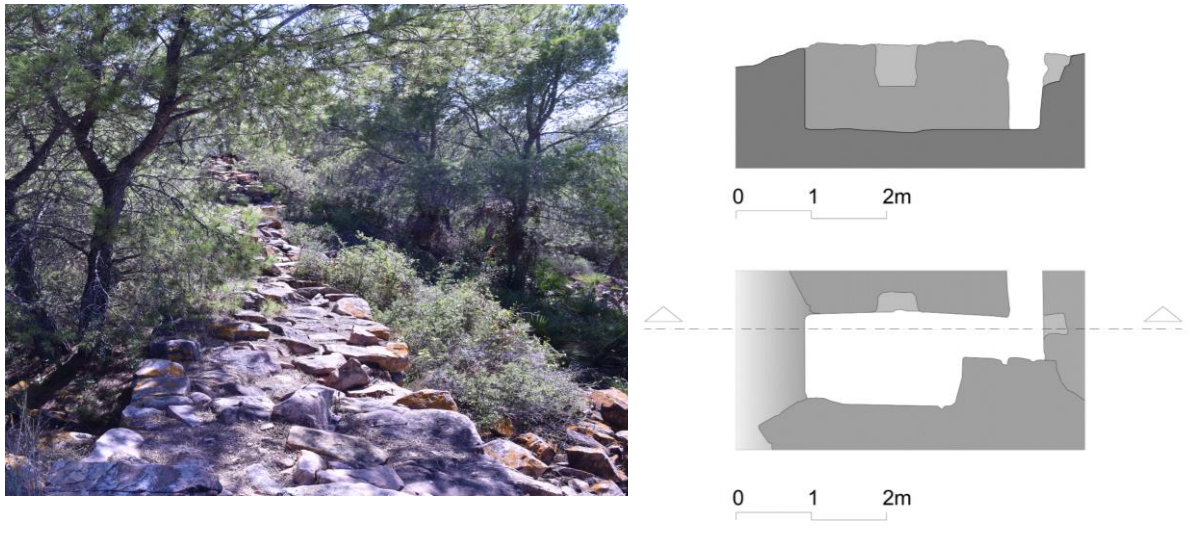


Figure 10 - 11. Observatory. Source: own work (2020).

## 5. Conclusions

The cases studied correspond to remains of military constructions that emerged during the Spanish Civil War, which are testimonies of great historical interest. Their dissemination contributes to increasing the knowledge of our past and enhancing the cultural tourism offerings. In this sense, their location, cataloguing, and study of their architecture and construction are shown as indispensable tools for this purpose. For example, a methodology of graphic study has been illustrated, allowing architectural descriptions to be made through scaled plans and enabling detailed understanding. It is a contribution, through graphic surveys, to the knowledge of a little-studied heritage, with the possibility of being incorporated into cultural tourism routes in municipalities in territorial contexts of abandonment and depopulation, which can promote revitalisation and local development.

## 6. Funding

This work has been carried out thanks to Jaume I University through the UJI-A2017-I3 Project "Formal and Constructive Analysis of Civil War Defensive Architectures in the Regions of Castellón" Scientific Research and Technological Development Projects.

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