

# Strategies for the Preservation of 20th Century War Landscapes. Memory, Knowledge, and Intervention

## Strategie per la conservazione dei paesaggi delle guerre del XX secolo. Memoria, conoscenza e intervento

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**Are the 20th-century defences, now abandoned, modern architecture? Do these stubborn ruins constitute heritage? Consolidated over time, military architecture proves to be a distinctive mark of the geographical areas and societies that host them. A multidisciplinary investigation, involving the University of Cagliari and the University of Alicante for over a decade, connects two regions of the Mediterranean, drawing a parallel between the territories of Sardinia and the Valencian Community, which share similarities and a common history, through the bunkers and batteries built between the two World Wars and scattered along the coastline. These engineering objects are, at the same time, modern architecture due to their use of regular geometry that defines types and models, their tactical distribution based on principles of observation and control, and the use of reinforced concrete, a resistant and malleable material, in their protective function. The research repositions these defences, stigmatized by the proximity to conflicts, based on their spatial, technical, and material characteristics, acquired through digital surveys, proposing their re-signification as the 'Wall of the Mediterranean,' removed from ideology and viewed as witnesses of material culture, with a proposal for registration, protection, and intervention.**

Le difese del XX secolo, abbandonate, sono architetture moderne? Queste rovine ostinate costituiscono patrimonio? Consolidato nel tempo, l'architettura militare si rivela un segno distintivo delle aree geografiche e delle società che le ospitano. L'indagine multidisciplinare che coinvolge da oltre un decennio le Università di Cagliari e di Alicante collega due regioni del mare Nostrum, mettendo in parallelo i territori della Sardegna e della Comunitat Valenciana, che presentano somiglianze e condividono la storia, attraverso i bunker e le batterie eretti tra le due guerre mondiali e disseminati lungo la linea di costa. Questi oggetti di ingegneria sono, contemporaneamente, architettura moderna per l'uso della geometria regolare che definisce tipi e modelli, per la sua distribuzione tattica basata sui principi di osservazione e controllo, e per l'utilizzo, con funzione protettiva, del cemento armato, un materiale resistente e malleabile.

La ricerca ricolloca queste difese, stigmatizzate dalla vicinanza dei conflitti, in base alle loro caratteristiche, spaziali, tecniche e materiali, acquisite mediante rilievi digitali, per proporre la loro risignificazione, come il 'Muro del Mediterraneo', lontano dalle ideologie e come testimoni della cultura materiale, con una proposta di registrazione, tutela e intervento.

### KEYWORDS:

Bunkers, Batteries, Concrete ruins, Sardinia, Valencian Community

### PAROLE CHIAVE:

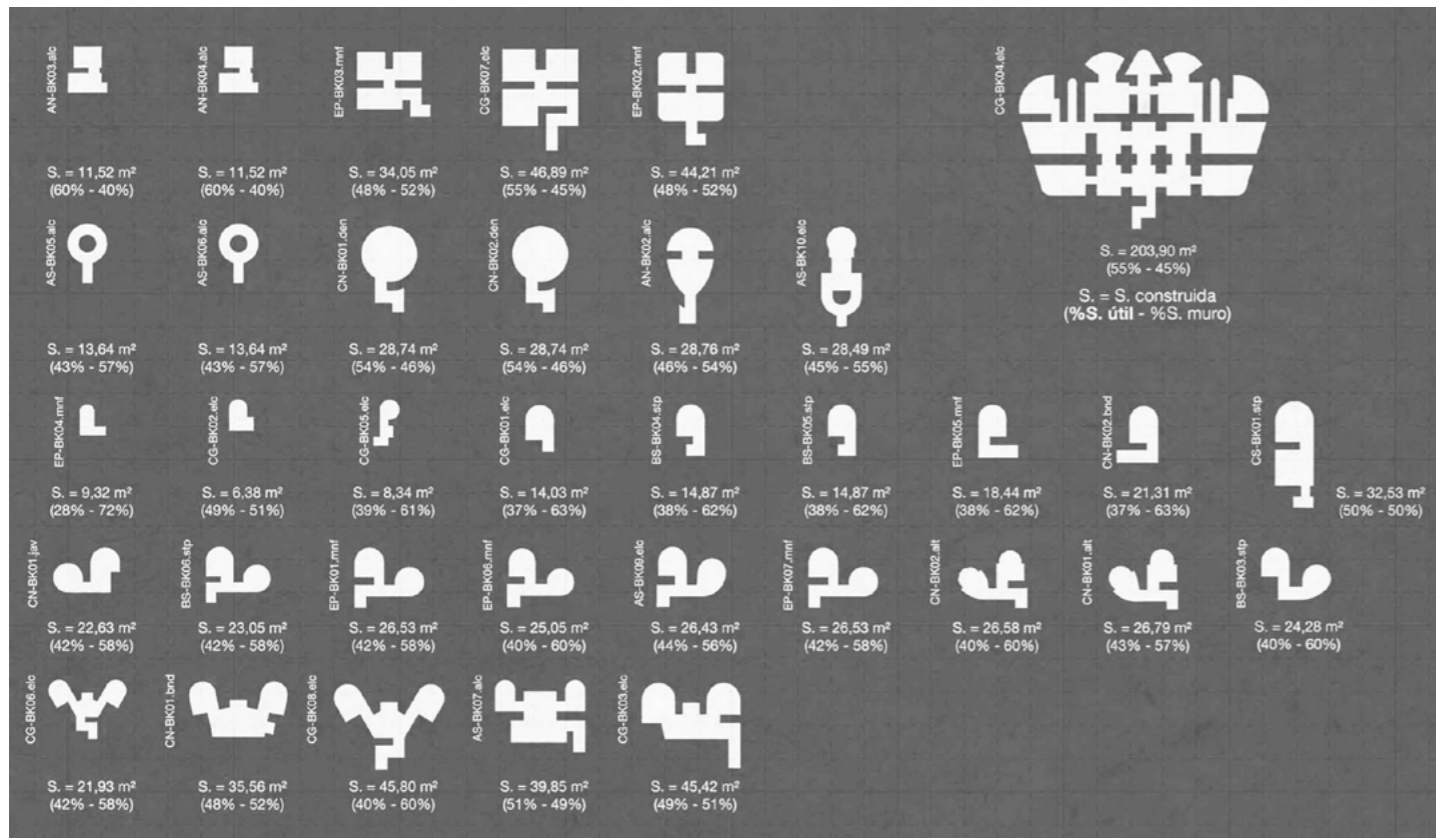
Bunker, Batterie, Rovine di calcestruzzo, Sardegna, Comunità Valenciana



01.

View of a 1940s concrete bunker in the Campo de Gibraltar, Spain.  
(A. Atanasio Guisado, 2016)





02. Types of bunkers from 1936-1939 on the Alicante coast (Spain): available internal space. A. Martínez-Medina, 2016



03. Bunker built between 1936 and 1939, developed on two levels in the centre of the Clot de Galvany lagoon, Spain. A. Martínez-Medina e P.J. Juan Gutiérrez, 2019

"My objective was solely archaeological. I would hunt these gray forms until they would transmit to me a part of their mystery..."  
Paul Virilio, 1975

**INTRODUCTION:  
THE WALL OF THE MEDITERRANEAN AS MEMORY CARVED IN CONCRETE**

The Wall of the Mediterranean, constructed with bunkers along the coasts of the Mediterranean Sea (Fig. 01.), can be read and interpreted as a reflection of the Atlantic Wall, which has been analysed on three distinct levels. In the 1970s, Paul Virilio contemplated these abandoned ruins on the beaches as the remains of a shipwreck and, using black-and-white photographs, he exalted them through a romantic vision (Virilio 1994). In the 1980s and 1990s, Rudi Rolf inventoried and precisely drafted these sophisticated defences, delving into the close relationship between form and function in these military architectures (Rolf 1985). Finally, in the 21st century, Michela Bassanelli and Gennaro Postiglione recognized that this system of architecture, mostly scattered along the Atlantic front, could not constitute a unified monumental complex. Therefore, they proposed, based on the adopted planimetric solution, the category of discontinuous cultural landscape (Bassanelli, Postiglione 2011). These three visions—esthetic, technical, and landscape—of this stigmatized heritage, based on three different graphic techniques—the photograph, the dihedral system, and topographic mapping—are hybridized as the starting point of our study.

Unlike the Atlantic Wall, the Wall of the Mediterranean, a concept established a decade ago (Martínez-Medina, Sanjust, 2013), does not respond to a unified project and was built over a longer period, roughly from 1925 to 1975, because each country—Italy, Spain, France, Albania, Greece, Libya—implemented its own defences as needed. These coastal fortifications display a wide variety of bunker types (Fig. 02.), yet each follows a custom design, as if it were an industrial object, typical of the machine age. The bunkers necessarily establish a dialogue with the avant-garde architecture of the interwar period, even anticipating the Brutalism that would peak in Europe between the 1960s and 1980s. Perhaps they are the first reinforced concrete ruins of modern architecture. Among the most distinctive features of these bunkers—apart from spatial, functional, technical, and material aspects—are the strategies related to their positioning: the panoramic control of the territory achieved by hiding and often blending into the terrain using cladding materials, to safeguard the lives of the soldiers. These are armoured architectures: not offensive, but defensive, even shelters. They are memories of wars carved in concrete.

**RESEARCH METHODOLOGY:  
ARCHIVAL WORK, FIELDWORK, AND SURVEYING**

A research project covering such a vast territory—all the coasts of the Mediterranean Sea—cannot be considered in its entirety from the outset but requires geographical delimitations. As a first step, the regions of Sardinia (Italy) and the Valencian Community (Spain) will be addressed (Martínez-Medina 2016) (Fig. 03.), which will allow for the establishment of cross-referenced relationships. The methodology begins with the creation of an inventory of defences: from archives, military maps, and through the survey of all the structures, especially when plans are lacking, using both traditional and digital methods for surveying and representing the results. The study will proceed with the creation of a database that

04. PP. 66, 67  
Bunker controlling communication routes within the Molentargius-Saline Regional Nature Park in Cagliari. Andrea Pirinu, 2018









05.

Bunker located along the coastline of Cagliari.  
Andrea Pirinu, 2018



06.

Bunker controlling the SS129bis highway leading to Bosa  
on the western coast of Sardinia.  
Andrea Pirinu, 2019

includes the different typological genealogies, their state of preservation, their camouflage with the landscape, and their landscape component. Following a certain logic, to obtain more comprehensive studies, by limiting the geographical areas and focusing on more specific and sectorial aspects, the development of doctoral theses will be encouraged. Finally, the collected data will serve to open two new paths for the future: the creation of heritage itineraries and the possibilities for its restoration.

#### ANALYSIS:

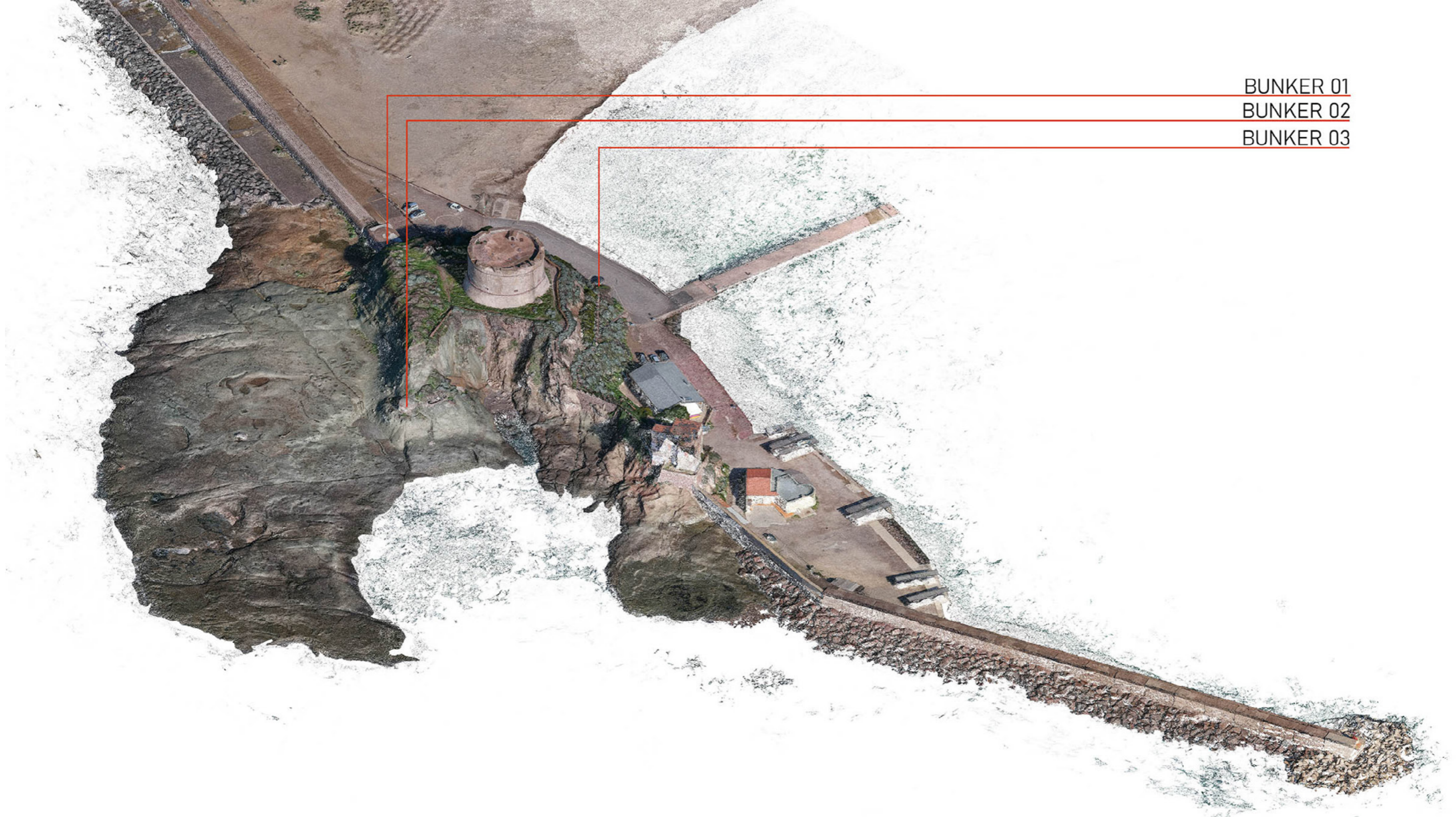
##### ORIGIN AND DISSEMINATION OF 20TH CENTURY WAR HERITAGE

An anticipated imminent Allied landing along the coasts of Sardinia led, in the early 1940s, during World War II, to intense reconnaissance, design, and implementation activities of a defence system by the Italian military engineers. This activity was carried out in a very short time and along the entire perimeter of the island. The results of this transformation of the landscape, however, are characterized by a modest landscape impact, also due to the small size of the bunkers that constitute most of the structures built. These bunkers are part of an anti-invasion defensive system implemented in 1942-1943 in Sicily, Sardinia, Elba, Pantelleria, and Lampedusa. After the war, the structures built on the mainland were demolished; however, in Sicily and Sardinia, a series of factors allowed their survival, eventually reaching a level of protection established by national and regional regulations, but in a general way, without a detailed inventory or in-depth studies of each individual case and military outpost of this architectural and landscape heritage, which remains somewhat stigmatized.

Often grouped into small settlements, these structures were positioned to defend infrastructures, communication routes, landing points, and access to cities (Figs. 04.–06.)

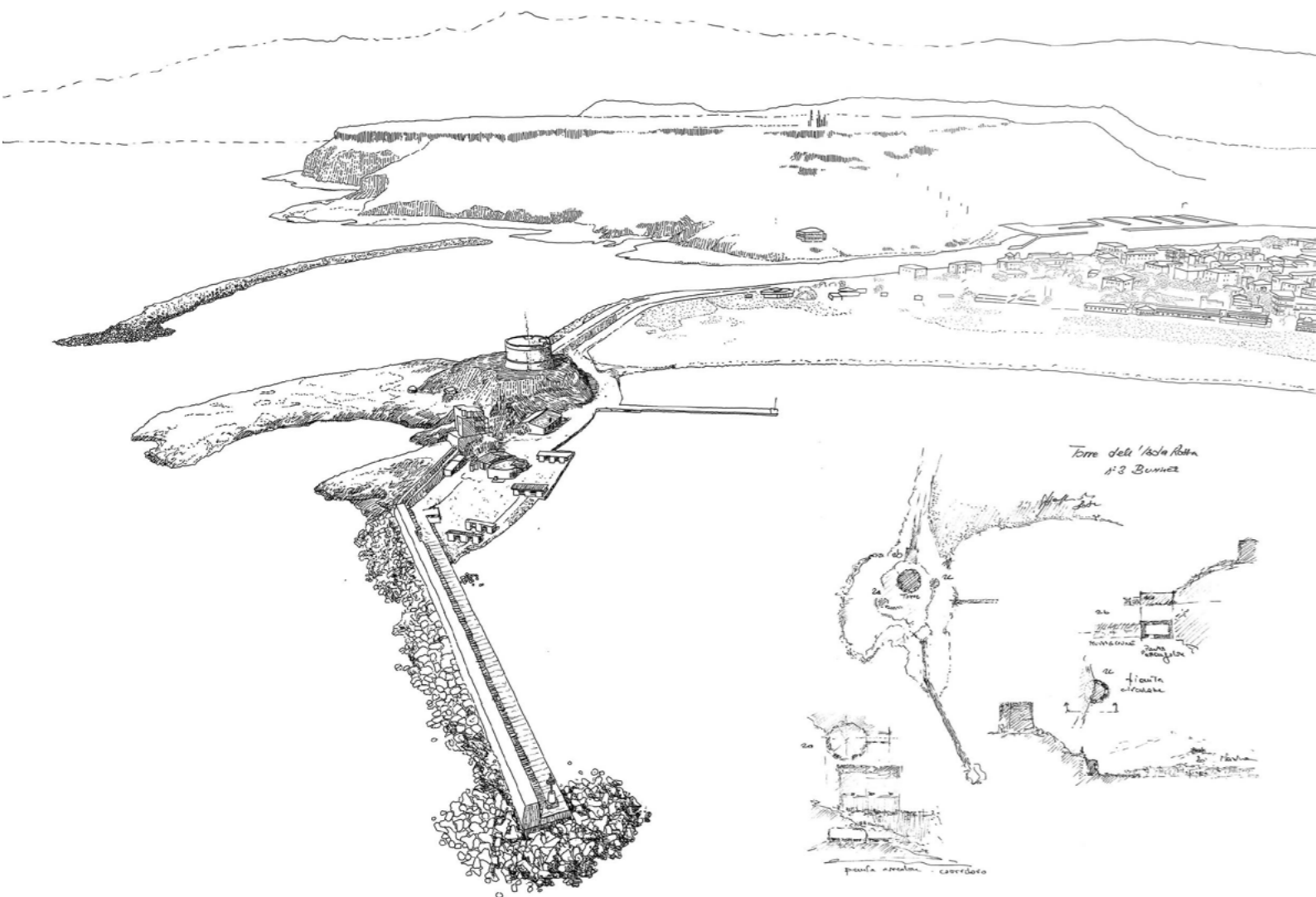


BUNKER 01  
BUNKER 02  
BUNKER 03



07.  
Digital model of Isola Rossa in Bosa.  
Nicola Paba in Pirinu e al. 2021





08.

Graphic analysis of the defensive system of Isola Rossa in Bosa.  
Giancarlo Sanna, 2023 ed Andrea Pirinu 2018

according to military strategies described in archival documents stored at the Documentary Archive of the 14th Department of Army Infrastructure in Cagliari and the Historical Office of the Army General Staff (AUSSME) in Rome. These documents illustrate their distribution across the territory based on IGM (Military Geographic Institute) maps and describe the planned design models, as well as the armament provided to each bunker based on the task assigned. Partial studies on Sardinia have already been conducted (Carro, Grioni 2014; Pirinu, Martínez-Medina 2019; Pirinu, Argiolas, Paba 2021; Rassa 2022). Based on these sources, it has been possible to start the process of cataloguing the existing structures, also with the aim of relating Sardinia's heritage to that of Spain, which, during the Spanish Civil War (1936–1939),

implemented a similar system, continued by Franco in the 1940s. In the case of Spain, the lack of many projects prevents a reconnaissance guided by maps, and thus adds further value to field research, aimed at surveying the existing structures and creating a knowledge database.

#### DISCUSSION: CHROMATIC RECOGNITION OF MILITARY LANDSCAPES

The knowledge of this significant cultural heritage deserves a preliminary reflection concerning the memory to which all industrial artifacts refer. These are primarily ruins that testify to various wartime activities, and the relationship with their context should never be underestimated. In fact, the place where the artifacts are situated often helps to understand the strategic reasons for their location and can also reveal the motivations behind the design choices, both in terms of placement within the territory and in relation to the morphological features of the landscape (Docci, Chiavoni 2017). It is always essential to conduct a thorough analysis of this uncomfortable, unique, sometimes sad heritage, through a careful examination of the material aspects, with the primary goal of recognizing its state of preservation.

This temporal graphic monitoring can be carried out through life drawing, which helps to investigate both the objective and concrete aspects, related to the structures, spatiality, forms, and different types, as well as the more intangible values, sometimes underlying, that the military sites and architecture convey. The key role is played by light, which, during the day, illuminates the structures, envelops them, and allows the colour of the material to be appreciated in its continuous variability. It is precisely an emotional and sensitive representation that helps to develop an awareness of the particularities of each artifact and can provide a conscious graphic foundation for future maintenance, regeneration, and restoration projects. These fieldworks complement the use of digital surveying, representation, and awareness methods. Life drawing and direct surveying have completed and integrated the instrumental and photogrammetric surveys with UAVs (Fig. 07.), with the aim of contributing to the creation of interoperable models of the highest precision and communicative capacity (Fig. 08.), which are an integral part of a stylistic, constructive, and landscape inventory of 20th-century war heritage.

In fact, the scientific method used is that of sighted surveying, which is carried out through life drawing, starting with perspective sketches to approach the site to understand its integration into the broader context, and then proceeding with the creation of proportionate field sketches for various parts of the architecture, ultimately reaching the detailed elements, such as openings, roofs, and walls. This efficient and direct approach, aimed at gaining a deep understanding of cultural heritage, leverages the spatial suggestions and emotions that the atmosphere of the site evokes. Given its multisensory involvement, it actively and dynamically expands the critical interpretations of each scholar (Hernández 2018).

Mutability is always a characteristic of these landscapes and structures; time reshapes them and continuously alters their state of preservation (Chiavoni 2017). The analogue graphic representation, made using watercolour or coloured pencils, allows for the nearly "objective" recording of this dimension: the corroded material, gaps or damage in the structures, patinas, and vegetation. The series of drawings that results is a graphic collection of information that, together, helps express the image of the site: from large to small scale, from the whole to the detail, making the characteristics of the place recognizable and unique (Figs. 09.–10.). These critical readings, both material and immaterial, combined with the graphic surveying work derived from the acquisition of numerous data through digital technologies, form an integrated body of knowledge, an indispensable foundation for any project.



## RESULTS:

### THE RECOVERY OF MODERN WAR ARCHITECTURAL HERITAGE

These stubborn ruins, which withstand the test of time, the first in history made of reinforced concrete, can therefore be included in a recovery project, even within itineraries that, inevitably, expand due to the richness of the layered historical heritage, including numerous other examples of military architecture. The potential valorisation work requires, in addition to a significant deepening of knowledge, the dissemination of results in such a way as to increase the sharing of the values of both material and immaterial heritage.

However, the issue now is not only the vast fieldwork, surveying, and inventory process, but also calibrating the possibilities for the reuse of this uncomfortable heritage, which may not evoke the same mystical feelings that motivated Paul Virilio. Today, we see the remnants of the Mediterranean Wall as components of a new layer superimposed on the landscape, inseparable from it. Among the various options, depending on the urban or rural context, it is worth highlighting their role as points of information (museums and cultural centres), their re-signification through artistic interventions, and their transformation into environmental observers for public use. A new life will allow these architectures, regardless of ideologies and political regimes, to be recognized as witnesses of the technical culture of the mid-20th century.

Note 1| Although the text is the result of a joint effort by the authors, sections 1. Introduction, 2. Research Methodology, and 5. Results are attributed to Andres Martínez-Medina, sections 3. Analysis and 5. Results are attributed to Andrea Pirinu, and section 4. Discussion is attributed to Emanuela Chiavoni.

Note 2| The research group also includes the architects Nicola Paba, Giancarlo Sanna, and Raffaele Argiolas from the DICAAR of the University of Cagliari, and Professor Pablo Jeremías Juan Gutiérrez from the DEGCP of the University of Alicante.

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09.



10.

09.

Bunker controlling the channels within the Molentargius lagoon in Cagliari.  
Emanuela Chiavoni, 2024

10.

Bunker camouflaged as a tank for controlling the channels and roadways within the Molentargius lagoon in Cagliari.  
Emanuela Chiavoni, 2024