

19 DEFENSIVE ARCHITECTURE OF THE MEDITERRANEAN

Ornella ZERLENGA, Vincenzo CIRILLO (Eds.)



DEFENSIVE ARCHITECTURE OF THE MEDITERRANEAN
Vol. XIX

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Editors
Ornella Zerlenga, Vincenzo Cirillo
Università degli Studi della Campania *Luigi Vanvitelli*



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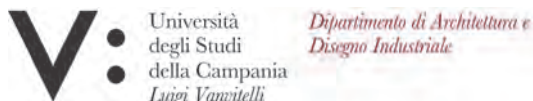
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Preface

After the first edition of the *International Conference FORTMED*, held in 2015 in Valencia and promoted by the President of the *International Scientific Society for Mediterranean Fortifications* (FORTMED), Prof. Pablo Rodríguez-Navarro from the Universitat Politècnica de València, the international event celebrates a decade of activity in 2025, establishing itself as one of the main reference points in Europe for the study, conservation, and enhancement of Mediterranean fortified architecture.

The eighth edition is once again hosted in Italy and is organized by the Università degli Studi della Campania Luigi Vanvitelli, Department of Architecture and Industrial Design (DADI).

In collaboration with various local, national, and international institutions, this eighth edition represents a renewed opportunity to further explore Mediterranean fortifications from a historical-cultural perspective while also reviving the debate on the strategic role of defensive architectures in relation to contemporary realities.

The Mediterranean is a region characterized by an extraordinary diversity of cultures, languages, and traditions, but it is also an area where fortifications have always played a crucial role in the defense of communities and commercial exchanges.

Indeed, fortifications scattered along the Mediterranean coasts and inland territories tell stories of conflicts, cultural exchanges, defense strategies, and technical/technological innovations. The need to understand and protect this heritage is becoming increasingly important, particularly in response to threats such as abandonment, degradation, and transformation of the urban and coastal landscape.

Furthermore, the valorization of this heritage is increasingly essential where strategies for sustainable use can trigger virtuous production processes while respecting both the identity testimonies recognized by local communities and the increasingly multidisciplinary scientific studies involving architects, engineers, archaeologists, historians, geographers, and specialists in conservation and restoration.

The eighth edition of FORTMED 2025 has maintained this interdisciplinary structure, welcoming contributions ranging from historical research to the analysis of construction materials, the use of digital technologies, and the management and promotion of Fortified Heritage.

As in previous editions, all contributions have undergone a rigorous double-blind peer review process to ensure the high scientific quality of the publications collected in the volumes of the “Defensive Architecture of the Mediterranean” series, now reaching its twenty-first volume.

In this edition, particular attention has been dedicated to the evolution of defense techniques over the centuries and the role of fortifications in contemporary times.

Discussions have addressed the influence of new technologies for the documentation and conservation of heritage, as well as the use of digital tools for modeling and structural analysis. Additionally, the pros and cons of the impact of mass tourism on fortified sites, in contrast with sustainable tourism that enhances cultural awareness regarding restoration and management policies, have been examined.

The eighth edition of FORTMED 2025 received numerous contributions. Among them, approximately 195 papers were selected, written by more than 370 authors and subjected to double-blind peer review by the Scientific Committee and field experts. The authors come from various countries, including Italy, Spain, Albania, Algeria, Croatia, France, Germany, Greece, Mexico, Poland, Portugal, Serbia, and Turkey.

As envisioned by the FORTMED Conferences, the participation of authors reflects a diverse community, not only comprising university researchers but also independent scholars, professionals, representatives of cultural heritage protection institutions, volunteers, and members of cultural associations, as well as doctoral candidates and graduate students, who have always represented the future of research.

The broad participation of multiple countries has allowed FORTMED to evolve over the years into an important platform for research and dissemination, fostering dialogue among experts and promoting the spread of innovative knowledge. The aspiration for this edition is that the conference will continue to stimulate new studies and collaborations, significantly contributing to the valorization of Mediterranean Defensive Heritage.

As introduced at the beginning, this edition marks a significant milestone in the history of FORTMED: the tenth anniversary of the conference. Ten years of studies, meetings, and research have expanded the knowledge landscape of Mediterranean fortified architecture, involving an increasing number of experts and scholars from various disciplines. In this sense, the International Conference FORTMED 2025 has also become an opportunity to reflect on past progress while outlining new research perspectives aimed at a greater sharing of knowledge and experiences.

One of the fundamental objectives of FORTMED 2025 has been the inclusion of new perspectives and innovative approaches in the study of Mediterranean fortifications.

In addition to historical-architectural studies, the conference has provided space for research analyzing the social and economic impact of fortifications when integrated into contemporary urban regeneration plans, assessing the costs and benefits of their rehabilitation and enhancement. Similarly, great interest has been shown in the topic of advanced digital technologies (such as 3D modeling and augmented reality), whose applications offer new possibilities for documenting and remotely experiencing defensive heritage, which is often inaccessible.

Another central aspect of the conference has been sustainability in conservation actions for fortified heritage. These architectures, often located in environmentally sensitive areas and in an advanced state of degradation, require management strategies that consider the balance between preservation, accessibility, and contribution to local development, as well as the maintenance of the site itself.

This is why integrating fortifications into cultural-tourism circuits represents a significant challenge, and FORTMED 2025 has provided a valuable opportunity to discuss best practices and innovative strategies in this field. We firmly believe that this eighth edition of FORTMED 2025 in Caserta has once again confirmed its success, bringing together a scientific and cultural community united by a vision in which the valorization of these historical testimonies embodies an ethical principle: transitioning from war to peace as an expression of harmony and empathy among people.

In conclusion, as chairs of this 2025 edition, we wish to express our gratitude to all those who made the organization of this event possible.

A special thanks goes to the Scientific Committee, which ensured the high-quality standards of the presented research; to the Topic Chairs, who coordinated the seven thematic areas of the conference: Danila Jacazzi (Historical Research), Ornella Zerlenga (Theoretical Concepts), Giuseppe Pignatelli Spinazzola (Research on Built Heritage), Raffaella Aversa (Characterization of Geomaterials), Vincenzo Cirillo (Digital Heritage), Fabiana Forte (Culture and Management), and Manuela Piscitelli (Miscellany); and to the Organizing Committee for its constant dedication to the successful realization of the conference.

We also extend our thanks to the academic institutions, local authorities, and scientific associations that sponsored this edition of FORTMED 2025, as well as to the sponsors who placed their trust in the event and supported its organization.

Finally, our heartfelt gratitude goes to the authors and participants, whose contributions have been essential to the success of the initiative.

We are confident that FORTMED 2025 will offer new study perspectives and further strengthen the international research network on Mediterranean defensive architecture.

Ornella Zerlenga, Vincenzo Cirillo
FORTMED 2025 Chairs

Contributions

Theoretical concepts

Fortified Heritage of Comino Valley (Latium, Italy)

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Abstract

The cultural landscape of the Comino Valley includes historical routes, towers and fortifications, creating a unique ensemble of great complexity and charm. Situated along once-strategic roadways, between Rome and Naples, it was a valley highly contested by many Landlords who, during the encastellation period, used its heights for the control of the territory by creating fortified centres. From an historical-territorial analysis of the geographical area, with a mapping of the fortifications, the study proceeds to the examination of these architectures through a chronological and typological classification. The reconnaissance of defensive architectures is an integral part of a process aimed at the enhancement of the monument and the revitalization of the urban context. Three categories are recognized: castles that are still easily identifiable, castles incorporated into the urban fabric of historic centres, and towers, symbolic and representative elements. Through the analysis of the state of conservation and use, those that require conservation interventions and those that have already received such attention are taken into consideration. Aim of this contribution is to raise awareness about the importance of preserving and redeveloping these medieval testimonies, so that their beauty can continue to be fully appreciated. The recovery action can promote individual cultural elements but also organize coherent itineraries among the various thematic components of the territory. Particularly, by interpreting the fortified landscape in relation to the built environment and the surrounding area, conservation and enhancement can be united. This approach can have a positive cascading effect, contributing also to the recovery and regeneration of small historical centres of the area.

Keywords: fortified heritage, cultural landscape, defensive architectures, conservation.

1. Introduction

1.1 Defensive Architecture of the Comino Valley

The defensive architecture of the Comino Valley represents a significant part of the historical and cultural heritage of this region. Situated along once-strategic routes, between Rome and Naples, it was in fact a valley highly contested by the seignories and landlords who wanted to exploit its heights to control the surrounding territories during the so-called encastellation period. For this reason, even in pre-Roman times, several settlements were established to control roads and

routes of vital importance for both military strategy and commerce. The valley was a true road junction (Fig. 1).

It had considerable significance as a communication channel between the southern territories (Campania-Molise), the central Apennine region of Abruzzo and the Adriatic coast. It is natural that fortified settlements were placed to control these key communication routes. Castles, for instance, were often built on high ground to provide a panoramic view and a

tactical advantage in case of attack. Watchtowers, scattered throughout the valley and along the mountain passes, were used to signal the

approach of potential enemies, creating a visual communication network between the various fortified points.

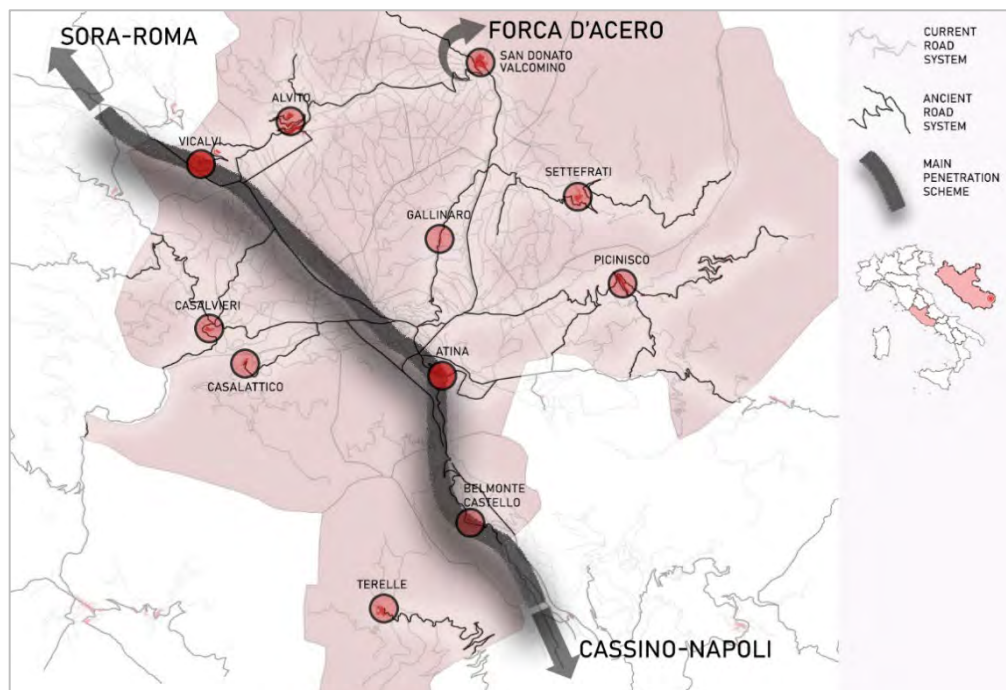


Fig. 1- Current and historical road systems between the main centres of the Comino Valley (Laura Lucarelli, 2024).

The need for protection against raids and local conflicts led to the development of these defensive structures. They were places of refuge and defense, but also centres of political and administrative power (Mancini, 2004). Meaningful examples include the castles of Alvito and Vicalvi, which controlled the road routes that crossed the territory of Sora. The fortified heigh of Atina closed the passage to Cassino through the fortified ‘Cancello Pass’. This fortified pass, which also had a custom function, represented an important defensive bulwark in ancient times. Its medieval fortifications were placed to defend the territory between the Land of San Benedetto and the State of Alvito, thus controlling the southern entrance to the village.

Today, these surviving structures provide fascinating testimonies of the construction techniques and military strategies of a bygone era. They offer a vision of how local communities

lived, defended themselves and interacted with the surrounding landscape.

Studying the defensive architecture of the Comino Valley gives a unique opportunity to better understand the military, social and economic history of the region, as well as the evolution of fortification techniques within the broader Italian context.

The fortifications of southern Lazio can be divided into three strategic-functional models: the “homogeneous castra”, consisting of fortified villages with no significant defensive elements; the “residential castra”, with more articulated structures and residential characteristics developed around elevated towers; and the “castra with enclosure and tower”, typically with few residential structures within them. But another relevant category in the Terra di San Benedetto area, which partly coincided with the Comino Valley, is that of the “populating castra”

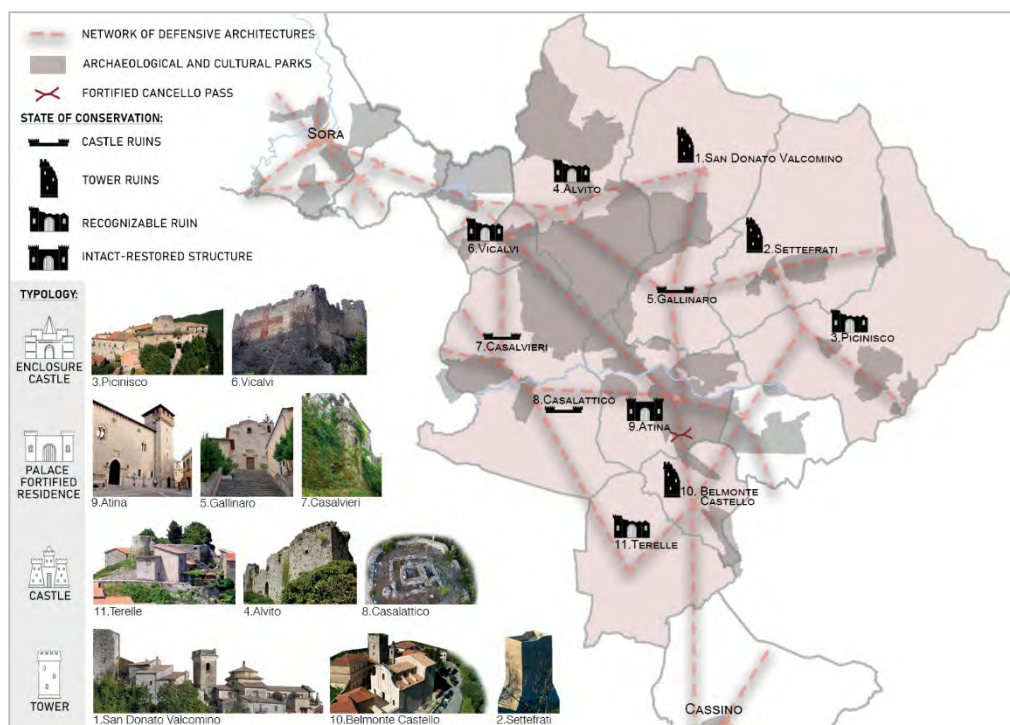


Fig. 2- Network of defensive architectures with their state of conservation. Archaeological parks recognised by the Regional Landscape Plan of Lazio (P.T.P.R.) (Laura Lucarelli, 2024).

(Toubert, 1997). These fortifications promoted repopulation after depopulation due to the Saracen invasions. The clusters formed the centres of local economies, recomposing the territorial organisation devastated by the Saracens in the 9th century.

With the rise of Frederick II to the throne, the defensive system of lower Lazio was subjected to significant transformations. The first years of his reign saw the destruction and deterioration of the existing fortifications. But after the peace treaty between the papacy and the empire, these architectures became the object of a vast reconstruction plan (Cigola & Gallozzi, 1998).

The phenomenon of the encastellation of the Valley's centres developed mainly in the early Middle Ages, between the 9th and 11th centuries. The structures, located on strategic heights and of various sizes and types, represented one of the most distinctive elements of the territory at that time (Lucarelli, 2023). Numerous fortresses were built corresponding to today's towns such as Atina, Terelle, Belmonte Castello, Picinisco, Settefrati, San Donato Val di Comino, Gallinaro,

Alvito, Vicalvi, Casalvieri and Casalattico. From the 12th century, the Comino Valley followed the political events of southern Italy, becoming part of the Kingdom of Sicily, Naples, and the Two Sicilies after 1815.

Nevertheless, the management of the territory was mainly in the hands of powerful local feudal families, among whom the Cantelmo and Gallio stand out, who left still visible traces in the castles, towers and ducal palaces scattered throughout the valley.

Medieval fortifications, harmoniously integrated into the landscape, are often located on strategic heights, at altitudes ranging from 430 to 830 metres above sea level.

These architectures constitute a distinctive feature that persists to the present day in a different state of preservation (Fig. 2). Among the most recognisable are the castles of Alvito, Picinisco, Terelle and Vicalvi, together with the elegant ducal palace of Atina.

The towers of Belmonte Castello, San Donato Val di Comino and Settefrati, also still stand as historical landmarks in the Comino Valley landscape. Instead, other structures, such as those

of Casalvieri, Casalattico and Gallinaro, are less identifiable as they are incorporated into the urban fabric.



Fig. 3- From the latest project for the Cantelmo Castle in Alvito (Capuano G., D'Ermo O., D'Avino E., 2023).

2. Some cases of recovery

Conservation and reuse of historic defensive structures require special attention, considering several factors such as the current condition of the building, the needs of the local community, potential uses and accessibility conditions. To achieve the goal of raising the awareness of the community towards virtuous interventions, the involvement of experts, cultural associations and citizens in the decision-making process is also crucial. By following this approach, it is possible to enhance not only the monument, but also to revitalise the urban context in which it is located in a sustainable way.

2.1. Alvito

An emblematic example of architecture with great potential for reuse is the Cantelmo Castle in Alvito. Owned by the municipality since the 1990, the castle is the subject of a recovery process aimed at restoring the ruined parts and consolidating those still intact, with the objective of hosting cultural meetings and social events (Fig. 3).

The first interventions date back to 1994 with a restoration that used original stones to recompose parts of the towers, battlements and main entrances together with the cleaning of the access point and the restoration of the vaults.

The enjoyment of the castle would make it possible to create a functional link between the fortified complex and the nearby historic village, which are currently architecturally and urbanistically separated. An in-depth analysis of the structure, conducted with the help of drones, 3D models and laser scanning surveys, allowed

the identification of elements that make accessibility of the castle and its 'Square of Arms' difficult, such as the presence of architectural barriers. The construction of ramped paths would guarantee full accessibility, making the castle fully suitable for public use.

2.2. Atina

Another significant example of reuse as a cultural space is the Palazzo Ducale Cantelmo in Atina, the most recent renovation of which, dates back to 2009 (Fig. 4). Already in the 18th and 20th centuries, it underwent various interventions: first it became a theatre, then a cinema and in 1870 a municipal seat. Later, it was used as a Mandamental Prison and was subjected to further major alterations before being damaged in the earthquake of 1915.

During World War II, the upper parts of the building, the roof and the interior were severely damaged, but were restored according to the design of architect and engineer Cherubino Malpeli (1898-1976).

From 1978 to 1993, the eastern part of the palace housed the Civic Archaeological Museum and the Municipal Library.

Today, the noble floor contains a Palatine Chapel dedicated to St. Onofrio, a large reception hall and a recent multimedia room that interactively tells the history of the territory. The Palazzo Ducale partly hosts private residences, municipal offices and a café on the ground floor, but continues to be an active cultural centre, allowing exhibitions, conferences, theatrical events and cultural manifestations of various types.



Fig. 4- Palazzo Ducale Cantelmo in Atina. 1. The facade in 1952 (Luciano Caira archive); 2. Point cloud from laser scanner survey, HeGo project (Cigola M., Della Corte T., Gallozzi A., Quattrini R., Senatore L.J., Strollo R.M.); 3. Restoration work in 1993 (Luciano Caira archive); 4. The roof during the 1992 restoration work (Luciano Caira archive).

2.3. Vivalvi

The Longobard Castle of Vivalvi, owned by the municipal administration since 1985, is one of the most enchanting medieval attractions in the Comino Valley, so much so that it was used as a film set in 2022. Although it is accessible upon request, including through guided tours, the castle remains one of the most neglected and least valued structures in the area. Its state of degradation is the result of a long history of abandonment and improper use, primarily due to the economic difficulties of local administrations, which have been unable to afford the high costs necessary for a proper restoration.

However, the castle has great potential for tourism and accommodation. The ruins of the ancient dwellings that surrounded it (Fig. 5) suggest the possibility of a transformation into a widespread hotel, a solution that could bring vitality and activity back to this important historical testimony. Since 2004, the site has been the subject of various restoration projects, with partial interventions such as the reconstruction of some walls and the removal of infesting vegetation, but these efforts have not been sufficient to completely redevelop the complex.

3. Conclusions

The defensive structures briefly described are a fundamental aspect of the cultural identity of local communities (Fig. 6). Despite their diverse

types and varying states of conservation, all of them require a specific path of protection and restoration. The current situation reflects that of many historic centers in inland areas, often neglected and abandoned, yet rich in cultural value and surrounded by intact, precious and natural landscapes. If properly restored, these locations could host accommodation facilities, services, and tourist residences, thus revitalizing the region. When a cultural site is in a state of decay and its value is underappreciated, it risks being of interest only to a few. However, if restored and promoted with appropriate tools for visitation and effective promotion, it can attract significant tourist flows, bringing economic and reputational benefits to local communities.

The described cultural sites, with their historical features and territorial distribution, represent a potential driving force for the regeneration of abandoned areas. However, maintenance has often been insufficient due to a lack of appreciation and promotion of their historical value. Poor interventions and inadequate management, also due to the marginalization of these areas, have led to significant alterations in heritage. A renewed social and institutional awareness of these territorial resources could support a recovery that not only preserves the structures but also reuses and promotes them within a cultural tourism context, as already occurs in other regions. The theme of recovery should not be limited to architectural or economic



Fig. 5- Longobard Castle in Vicalvi (Laura Lucarelli, 2022).

aspects but should embrace a broader vision of the role these centers can play in the life of the region (Crova, 2013). In other words, it is necessary to move from a culture of “recovery” to one of “reuse”.

In the Comino Valley, the cultural heritage consists of strategic locations, historic routes, mountainous agricultural landscapes, towers, fortifications, and lookout posts, which together create a unique and fascinating complex. The restoration of these resources, through

coordinated action, can enhance individual elements and structure coherent itineraries that connect the various components of the territory. Integrating these points of interest into a multimodal network is crucial for effectively promoting the cultural system, thereby contributing to the recovery of small historic centers (Bonamico & Tamburini, 1996).

This approach can generate a positive ripple effect, encouraging the overall regeneration of the area.



Fig. 6- Defensive Architecture of the Comino Valley. 1. The Longobard Castle of Vicalvi; 2. Cantelmo Castle in Alvito; 3. The Tower of San Donato Val di Comino; 4. The Tower of Belmonte Castello; 5. The Castle in Picinisco; 6. The Castle of Terelle; 7. The Ducal Palace in Atina.

Defensive architectures still recognizable and potentially recoverable			
	municipality	architecture	state of conservation
1	ALVITO	Castello Cantelmo - Built at the end of 11th century as a military citadel with 13 access gates - Trapezoidal shape with two concentric walls and corner towers	- RUIN POTENTIALLY RECOVERABLE: although some parts have been partially consolidated through recent works, it is not adequately enhanced. - RARELY USED: only for some summer music events - PARTIALLY VISITABLE
2	ATINA	Palazzo Cantelmo - Built in 1350 - Gothic style with a quadrangular plan and two remaining square corner towers	- INTACT but altered from its original shape and volume (renovated in 1786, 1912, and 2009). - CURRENTLY USED: it hosts municipal offices, exhibitions, conferences, and events - PARTIALLY VISITABLE, some rooms are not accessible
3	PICINISCO	Medieval Castle - Built in 1054 - Residence castle with cylindrical tower, corner towers, moat, and drawbridge	- RUIN POTENTIALLY RECOVERABLE: only restored in the 13th century by the Cantelmo family. Today it is private property - RARELY USED: hosts festivals and events in its courtyards - VISITABLE
4	TERELLE	Castle - Built in 1000 - Of the castle are two towers well visible	- RUIN POTENTIALLY RECOVERABLE but privately owned. NOT USED - NOT VISITABLE
5	VICALVI	Castello Longobardo - Built in 11th century - Polygonal plan, almost intact double wall, cylindrical and quadrangular perimeter towers	- RUIN POTENTIALLY RECOVERABLE: Transformed into a field hospital during World War II. - RARELY USED: last use as a film set location in 2022 - VISITABLE upon request

Table 1- Recognizable defensive architectures.

Defensive architectures integrated into the urban context			
	municipality	architecture	state of conservation
6	CASALVIERI	Castle - Built in 1046 - Surrounded by a defensive wall. Previously towered and crenellated around the perimeter.	REMAINS poorly recognizable: it was transformed since the 1500s and incorporated into the urban fabric maintaining all the defensive elements.
7	GALLINARO	Castle - Built in 1010 - On the site of the castle is the church of Santi Giovanni Battista and Evangelista	REMAINS poorly recognizable: a church was built on its remains

Table 2- Defensive architectures no longer recognizable.

Remains of towers			
	municipality	architecture	state of conservation
8	BELMONTE CASTELLO	Castle - Built in the 12th century - DESTROYED by bombings during World War II	REMAINS: only the towering stone columns of the entrance and the tower are still standing
9	S.DONATOV.C.	Castle - Built in 1260 - It must have been structured as a military citadel.	REMAINS of tower and 5 access gates. The tower is 12 meters high and oriented like a compass, indicating cardinal points, the abbey, and the position of the Sun on equinoxes and solstices
10	SETTEFRATI	Castle - Built in 10th century - The village is dominated by a semi-detroyed tower	REMAINS of towers and walls

Table 3- Tower ruins.

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