

## RESEARCH ARTICLE

# The Tower of Nisida as centre of 17<sup>th</sup> century fortified naples system



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**Abstract** The paper investigates the territorial layout of the fortified system of Naples that developed during the Spanish Vice Kingdom in the 16th-17th centuries.

Both existing castles and towers, and constructions built for the purpose, were included in the system. The Tower of Nisida is one of the existing ancient towers that became part of the impressive 17th century defense system of Naples.

The study focus is on the strategic importance acquired by Nisida and its Tower in those years, when it became a key location in the fortified system, both evidencing its cruciality through the study of the field of vision that widens from the location and dealing the issue with the point of view landscape and territorial defense, recalling the concept that the defense architecture is part of architectural heritage.

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## 1. Introduction

The paper deals with the most ancient artefact located on the island of Nisida, that bears the traces of a great past,

from the *opus reticulatum* of Roman times to the prison cells for adolescents at the turn of the Second World War.

The study of construction such as the Tower of Nisida, which have also changed many uses, is particularly significant because it helps to understand the evolution of society itself over the centuries through the evolution of architecture, and vice versa.

In particular, military structures were of great importance in the urban morphology of the past, and even if the aspect that specifically concerns the thematic field of Authors is the structural and architectural one, the social role

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-strictly linked to the military pivot role-of the Tower of Nisida, cannot be overlooked.

The work is carried out on two parallel levels, the archive research, and the on-site observations.

By means of archive research, an attempt has been made to put the cartography in order, with the aim of documenting the development of the island's military vocation, pointing out that several times the documents report that it was not born as a military garrison, but became one, thanks to its strategic position. Transformation of use that involves and distorts the entire artefact, both from the structural and morphological point of view. As will be seen in the following pages, the focus of the research is precisely this transformation, which intersects and interfaces with the history of the Tower, the history of the island of Nisida and the history of the city of Naples.

The tower is widely mentioned in literature as Brutus' villa, Piccolomini palace, Bourbon prison, but very few documents deal with Nisida Tower role as a military garrison, even if it is present in the urban design since the late 1700s, as proved in the follow.

Through a ten-year agreement with the IPM (Juvenile Penal Institute) of Nisida and the University of Campania Luigi Vanvitelli, our working group has direct access to the area and therefore some images and surveys are unpublished, and some considerations came out from the direct observation.

The main aim of the work is firstly to bring to light a history that is often forgotten and denied to the territory, since the island of Nisida has been off-limits to the town since the distant years when - precisely - it was turned into a military garrison, and secondly to highlight the relations that the island has with the rest of the coast, mainly with Capri and Posillipo and Baia. These relations to this day are pleonastic, as the island's relations with the city ended abruptly around the second half of the 17th century when the Tower was converted into a Bourbon prison and the entire island was barred to the population.

The ban, on the one hand denied the island to Naples and the Neapolitans, and on the other, it preserved Nisida from the degradation that the surrounding area have suffered for years. Today, even though the juvenile prison (albeit modern and functional) is still active, the island is slowly opening to the city's culture and the Tower, of ancient memory, deserves the attention of in-depth studies that reveal the essential role it has played over the years.

## 2. Historical overview

Between the Middle Ages and the Renaissance, the city of Naples had at least five castles in its defense (Castel dell'Ovo, Castel Capuano, Castel Sant'Elmo, Castel Nuovo, Castello del Carmine) and two fortresses, one to the west (the Tower of Nisida) and the other to the east (Fortino di Vigliena), testifying to the economic and military power to which the city had reached. But the entire city was part of a much more complex system of fortifications: the military citadel on the Pizzofalcone promontory, which acted as a link between Castel Sant'Elmo and Castel dell'Ovo, to which the Ramaglietto was added, constituted a line of

defense capable of crossing the shots on one side with the Carmine, Vigliena and Granatello, and on the other with the Batterie di Sermoneta, Posillipo, the Gajola and Nisida. The castle of Baia and its complex stratification were changed following the introduction of firearms and the capacity for ever greater cannon ranges, which required the construction of the sea tenge and new batteries along the coastline as far as Pozzuoli. Capua, one of the most important military strongholds of the kingdom with important fortifications in the 'modern' style, has been the subject of meticulous investigation because it was there that the *tricerate camps* were experimented, which valuable drawings restore to us in their original articulation (Amirante et al., 2009). Finally, Castellammare with its port and dockyards completed the defense of the coastline by preventing possible enemy landings on that stretch of coast well connected to the capital. The coastline from Castellammare to Punta della Campanella, due to the lack of an adequate road network, was of no concern to the military who still opposed the construction of a road link with Vico Equense in the 1830s. Within the Gulf of Naples, the hamlet of 'Castell'a mare' has always occupied a very important place from the earliest times to the present day. Shipbuilding industry and port activities have been the most prominent components in the economic life and urban history of the Stabiese little town.

Fortified systems were a living or active organism that were constantly updated in time. The case of Nisida is representative of the change of status of a fortification which acquired importance centuries after its erection, this is the reason why the paper will do focus on the Tower of Nisida.

### 2.1. The case of Nisida

The island of Nisida (Zerlenga et al., 2016a,b) is in an enchanting natural landscape of rare beauty in Phlegrean coast (Fig. 1). Nisida has an ancient history: geomorphological (eruptive cycle of the Campi Flegrei); mythical (the adventures of Ulysses); archaeological (summer Brutus' residence); defensive (until World War II). The defensive role of Nisida is demonstrated by its presence in the most important maps of the time. In the Angevin period, on top of the island a cylindrical watchtower was built. On its facility, in the sixteenth century, works began with the aim of the construction of ramparts tower, as noble residence of the Piccolomini and maritime surveillance. In Bourbons age, two forts in Porto Paone were built, used until the Second World War. Today, the access to the island of Nisida is prohibited because inside there is a juvenile penitentiary. The current surveys of defensive architecture, recently discovered, are occasion of documentation for the enhancement of the existent.

The Tower of Nisida born as watchtowers. In fact, due to the topographical conditions of the coast, there are several points that are not covered by the view from the Castles. These blind spots can be only compensated with watchtowers along the coastline. By these fortified towers the arrival of an enemy navy could be very soon detected and communicated to the main harbors and castles. The Tower of Nisida became the "hub" of the fortified system of



Fig. 1 Nisida by Google Maps, 2022).

Naples by being the unique point that communicates the two sub-systems of the Gulfs of Baia and Naples (Fig. 2).

The historical events of the Tower of Nisida have ever been an object of study (Cardone, 1992; Cennamo and Zerlenga, 2015; Ferri Missano, 1987a; Zerlenga et al., 2016a,b). The transformations undergone by the Tower are considerable, not only in its original use (from a defensive Tower of the Phlegrean coast, to prison) but above all in its overall configuration (Fig. 3).

In the post-war period, half of the tower was demolished for reasons that are still unclear, so that its current appearance is that in (Fig. 4).

According to certain studies (Ferri Missano, 1987b) the tower was built on the site of one of Brutus's dwellings, which was probably a hunting lodge, without many of the luxuries that characterized the other dwellings along the coast from Baia to Pozzuoli. Presumably, at the time of Viceroy Don Pedro de Toledo (1484–1553), the tower was reinforced to withstand attacks by Turkish pirates who easily took refuge in Porto Paone and it became a military garrison. Later, from 1558 to 1588 it was the site of the Piccolomini residence (Croce, 1894, 1990) and the Duke of Amalfi embellished it with gardens and converted it for residential use.

The transformation of the building into a prison for lifers took place sometime after the island was transferred to the state property, during the Bourbon's era, with the old 16th-century construction being incorporated into the plan of the new building. The prison was suppressed between 1933 and 1934, later becoming a judicial reformatory and finally a re-education home for minors. After the war, the tower

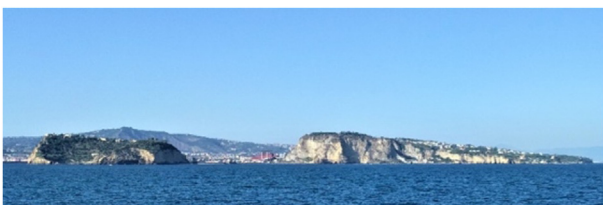


Fig. 2 Nisida and Posillipo, relationship between the Island and the City, view from the sea.

was permanently removed from any destination of use, practically remaining abandoned.

Over the years, the morphology of the Tower changed, mainly due to its 19th-century use as a prison and its partial demolition in the 20th century (Figs. 5 and 6).

The current entrance is a spiral staircase, located inside the scarp, and dated at the end of the 19th century, which leads to the only surviving room on the upper floor (Fig. 7a). From this space, a single ramp stairway goes down to the lower floor in the scarp's volume. At this floor, surveying activities have highlighted the existence of twelve internal spaces, configured following a radial structure (Cardone, 1992; Cennamo and Zerlenga, 2015; Zerlenga et al., 2016a,b). The first two rooms are the only ones to present a planimetric development with a semi-circular course such as to assume an original use as a casemate for pieces of artillery. On the perimetral walls, there are traces of the penalty cells with ventilation to the inner courtyard and windows to the outside (Fig. 7b). The next room (which contains the spiral staircase envelope) allows access to the remaining nine rooms, connected by an annular corridor.

The surveys conducted on the Tower include the inspection of the remains of the old inner courtyard with the traces found to date (cisterns, tunnels, wall textures of various dates, and some parts in *opus reticulatum*) on which many dating hypothesis have been carried out. To investigate the multiple specificities and to define the process of knowledge of the ruins of the cylindrical Tower, both the analysis of the spatial configuration of surviving spaces and the inspection of the constructive features have played a crucial role. On this basis, the research team has performed a project of architectural survey divided into several phases: analysis of iconographic sources (maps, views, photographs), comparison with previous architectural surveys, inspections, architectural and structural survey of existing spaces (Fig. 6) (Cennamo et al., 2021), obtaining a quite complete photography of situation belong the centuries.

### 3. Systematic fortification of the coasts: the Tower of Nisida and its environment

A fortification never works alone: usually, it belongs to a system of fortifications through which the territory is controlled and defended by the visual communications and/or the artillery range. The Naples kingdom's great defensive system was developed in the 16th century, mainly by the vice king Pedro de Toledo. It consists of castles and fortress' emplacement that protect the bays and harbors and a web of watchtowers along the coastline. The construction of these Towers was methodical, rising Towers in capes on promontories at a distance amongst them that allowed the visual communication and the vigilance of several kilometers of the horizon. The defensive system often took advantage of the medieval fortifications, rebuilding and modernizing them to the firing artillery.

This global system can be divided into subsystems for each bay or harbor: the forts functioned together; they crossed the fires and protected enemy ships' entrance. For example, the prominent Gulf of Naples, closed by Ischia,



Fig. 3 a) The Tower in '50s (Ferri Missano, 1987a); b) Bourbon's prison, kindly granted by the archives of the IPM (Juvenile Penal Institute) of Nisida.



Fig. 4 The current state of the Tower (from Zerlenga et al., 2016b).

Procida and Capri, can be subdivided into several subsystems: the bay of Baia, the bay of Naples, the coast near the Vesuvius and the Sorrento coast, at last, the Amalfi Coast towards Salerno. However, the subsystems of Baia and Naples have not visual connection. This is the reason why Nisida can be considered the key between these subsystems, and it was promptly incorporated to the coast defenses.

The kingdom of Aragon conquered the south of Italy in 1442 where already found a web of castles erected by the precedent dynasties: the Hohenstaufen from Swabia,

during the 12th and 13th centuries, and the Angevin from Anjou. The Aragonian developed a fortified system in which the improvements in artillery were taken strongly into account. They built new castles and reinforced the existing Swabian-Angevin (Santoro, 1992). In 1504, the Spanish Vice Kingdom was established under Charles V, the Emperor, and stopped in 1707 after the Succession War.

Along the 16th century, invasion risks from foreign regions (Venetia, Ottoman Empire, France ...) forced to update and reinforce the defenses, especially the coast

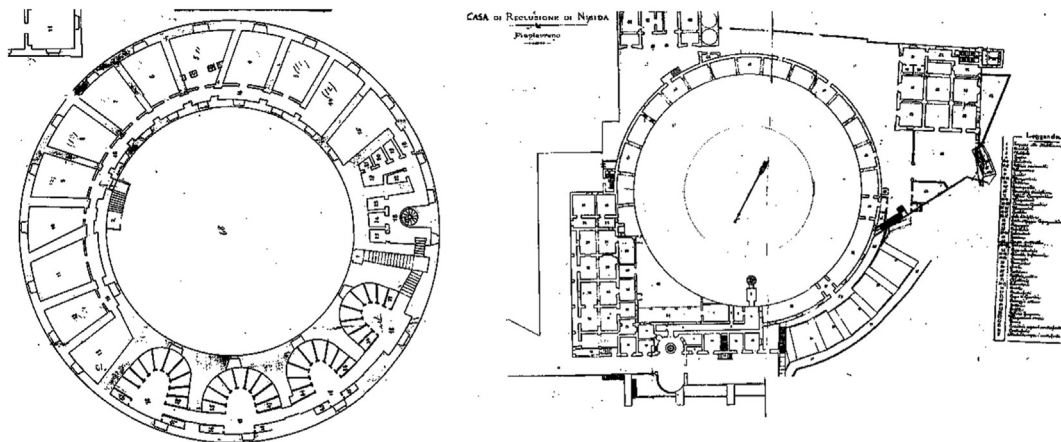


Fig. 5 The tower around 1935, kindly granted by the archives of the IPM (Juvenile Penal Institute) of Nisida.

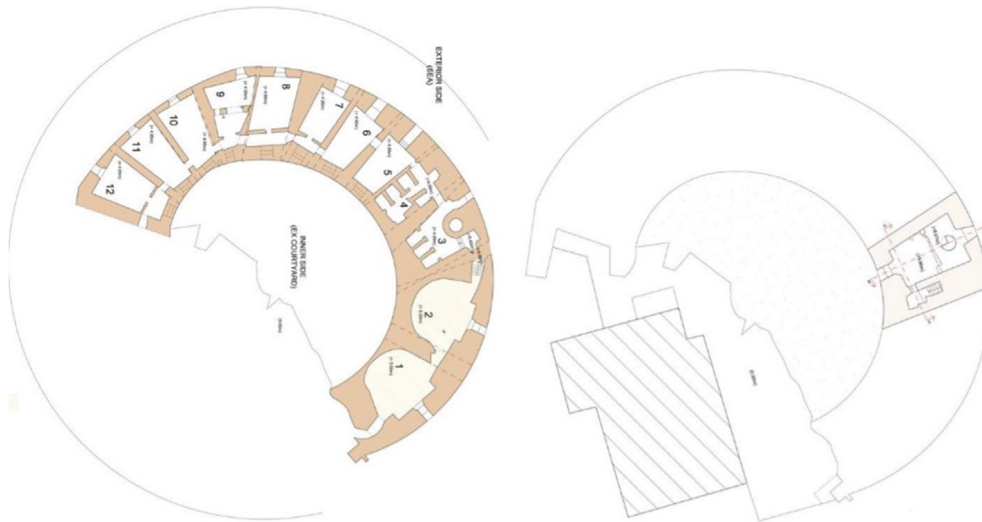


Fig. 6 Surveyed plans of the Tower: the actual state (Zerlenga et al., 2016b).



Fig. 7 a) spiral stair of the Tower; b) interior of one of the cells, in where transformations in the wall can be seen.



Fig. 8 The defenses of the Gulf of Baia: Nisida and Capo Posillipo from Pozzuoli, Pozzuoli from the sea, the Aragonian Castle of Baia and the Tower of Capo Miseno from the sea.

due to the increases in attacks by sea. Around 1535, Francis I of France and the Ottoman emperor Suleiman the Magnificent signed an agreement against Charles V (De Rosa, 2001). Simultaneously, the Vice King Pedro de Toledo conceived a preventive fortification plan (Crova, 2016) that start-up between 1536 and 1560 (Starace, 2006). The naval attacks and city sieges were frequent and for these reasons they had, first, to fortify the cities of the Vice Kingdom (Sánchez García, 2016) and, second, to control the coasts to avoid any surprise attack (Ministerio de Defensa, 2013). This plan was designed and built in the middle 16th century but was developed and spread along the following centuries until its loss of functionality (Russo, 2009). But the coast defense is not only guaranteed by the construction of fortifications: the population was also involved in the “active” defense, as several documents reveal (Mauro, 1998).

The bay of Baia was defended by the castles of Ischia and Baia and the fort of Pozzuoli (Amirante and Pessolano, 2008). In the Phlegrean Fields there were several watch-towers which function where also the defense of the inland: Torre Ranieri, Torre Cervati, Torre Sannazzaro, Torre Bassa, Torre Alta di Capo Miseno, Torre Fumo, Torre Gaveta and Torre Patria (Buccaro, 2008) (Fig. 8). The Tower of Nisida is part of this scheme, even if its entrance in the system occurred in late, being born as private Tower.

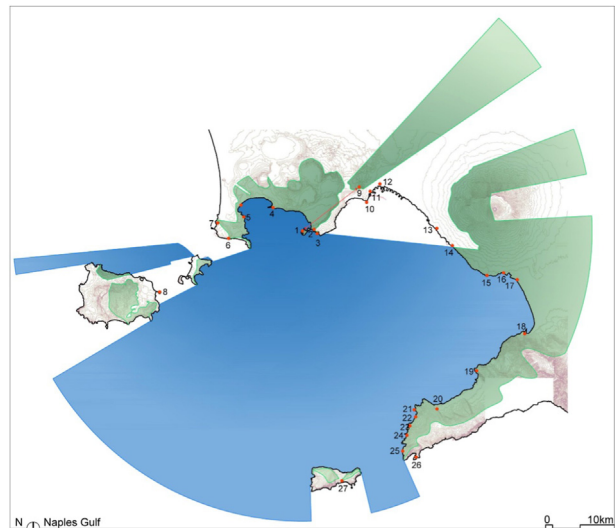
The bay of Naples had a complex system of fortifications. The city was defended by the ancient medieval and Aragonian castles of Ovo, Maschio Angioino (Castel Nuovo), Carmen (in the coastline) and Sant’Elmo (on the top of Vomero hill). The city was surrounded by walls, Aragonian at the origin (Galdieri, 1953), and then demolished in part, enlarged and reinforced by the Pedro de Toledo in the 16th century. The coast defense was completed with watchtowers (in the coast of Torre del Greco, Torre Annunziata ...), castles (Castellammare di Stabia) and city walls, like those of Sorrento. In the hinterland, several cities functioned as a fortified cincture, as Nola and Capua. All these defensive architectures can be understood as part of fortified subsystems that complete the global defense of the coast of the Vice Kingdom of Naples.

## 4. Visibility and defense: the Tower of Nisida as keystone of the fortified system

### 4.1. Distant and combined visibility of Nisida

The primary function of the watchtowers was the vigilance of the coast. Due to their high over the sea level, the garrison could see an enemy boat several miles in the sea and communicate the possible attack to the main fortresses and cities. Also, they protected the small capes and harbors from avoiding that an enemy ship could be hidden there.

The Tower of Nisida is placed in the top of the island, at 105 m over the sea level. Although Naples’ harbor cannot be seen due to Posillipo cape, the visibility from Nisida raises the whole coast of Naples Gulf, the Sorrento Peninsula, Capri and, especially, the Baia bay, Ischia and Procida, and the Phlegrean Fields with Pozzuoli in first term. To



**Fig. 9** Visibility field from Nisida, emphasizing the visual communication with Sant’Elmo castle. 1. Nisida; 2. Posillipo; 3. Gaiola; 4. Pozzuoli; 5. Baia; 6. Torre Capo Miseno; 7. Torre del Fumo; 8. Castle of Ischia; 9. Castel Sant’Elmo; 10. Castel dell’Ovo; 11. Maschio Angioino; 12. Castel del Carmine; 13. Torre del Greco; 14. Torre di Ripastrezza; 15. Torre del Oncino; 16. Torre della Annunziata; 17. Torre di Rovigliano; 18. Castellammare; 19. Vico; 20. Sorrento; 21. Torre dei Molini; 22. Torre della Marina; 23. Torre di San Lorenzo; 24. Torre di Vacola; 25. torre di Papa; 26. Torre del Capo di Minerva; 27. Castello di Capri.

calculate the visibility from the Tower can be interesting to understand its relevance: the maximum distance viewed from an elevated point until its horizon (in a clear day) can be calculated

$$d(\text{km}) = \sqrt{2hR + h^2}, \quad (1)$$

being  $R$  the medium radius of the Earth (6371 km) and  $h$  the high of the point from the sea level. The (1) can be written also<sup>1</sup>

$$d(\text{km}) = 3.85\sqrt{h(\text{m})}, \quad (2)$$

Developing, the result is that the visibility from Nisida is more of 42 km. In the 16-17th centuries, a Spanish galleon could reach 7 knots as maximum speed; that is 13 km/h. Henceforth, from Nisida, a ship could be sighted more than 3 h before arriving (Fig. 9) (Fino, 2011). The longitude of the visual field can be increased thanks to the synchronization of the whole system of Towers and castle: when a hazard was detected, a visual sign was quickly sent (a fire in the night, smoke signals in the night, bells, cannon shots ...) and communicate to the coastal Towers in the same time.

As the visibility map of Fig. 9 and the photographs of Fig. 10 show, from Nisida the whole Baia Gulf can be seen and controlled (Towers and castles of Posillipo, Gaiola,

<sup>1</sup> The maximum range, that is, with a 45° shoot, could reach longer distances, but without shooting ability. The half colubrine could reach 3.600 steps (5.000 m) and the sacre, 5.000 steps (6.965 m).



**Fig. 10** Visual field of Nisida Tower: a. the bay of Baia; b. Cape Miseno, Procida and Ischia; c. the castle of Baia; d. Pozzuoli.

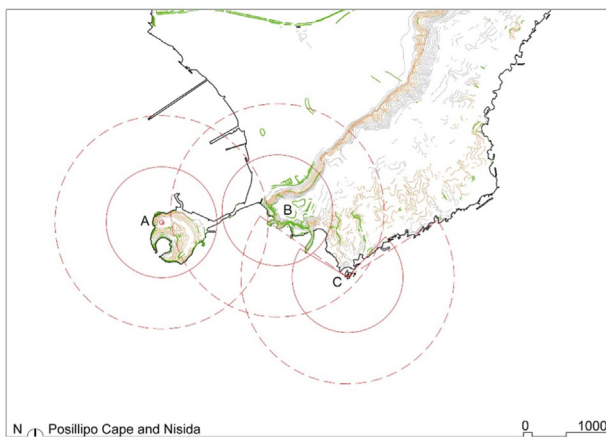
Pozzuoli, Baia, Torre Capo Miseno and Torre del Fumo), and also the East coast of Procida, the North face of Capri and its castle, and the North-West coast of the Sorrento Peninsula between Torre di Ripastrezza and Torre di Papa). However, Posillipo Cape hides the internal part of the Naples Gulf. Being the group of Towers and castles part of a whole fortified system, the fact is that the gulfs of Baia and Naples has not visual communication except through

between Nisida and Sant'Elmo. And this is the point that marks the importance of the Tower of Nisida, that acts as a keystone between these two sub-systems of fortifications in the Gulf of Naples and its islands.

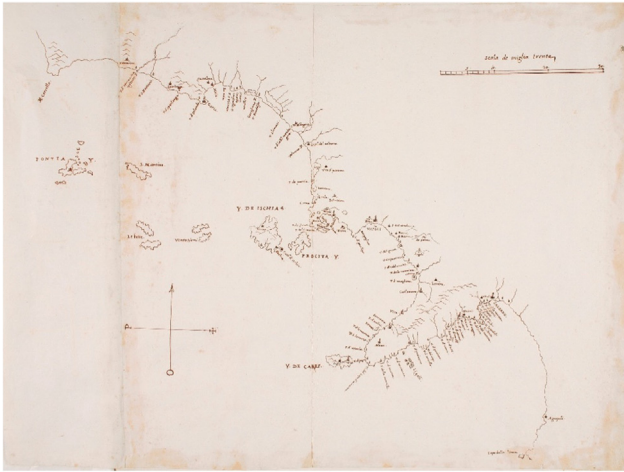
#### 4.2. Artillery and defense

The artillery that could be placed in each Tower was small and only allowed to defend the Tower's soldiers themselves. The main forces, horsemen and wards, were not placed in the Towers and castles, but in barracks. For example, in the castle of Baia, in 1584, the garrison was formed by 55 men; in 1586 by 69; in 1610 by 61 soldiers (Mazzella, 1586). In the watchtowers the garrison was very small: a sergeant and three soldiers, commonly, in the 18th century (Mauro, 1998).

When in 1546 the Tower of Nisida is remodeled by Pietro de Orsanque, the idea was that "the minimum necessary for the defense of the Tower is an artillery munition of 15 cantara for long shot and to beat the coast of Bagnoli" (Rivas Albaladejo, 2015). Two cannons only formed the artillery of Nisida in 1615: half colubrine of 12 pounds and a *sacre* (cannone da campo) of 8 pounds. For understanding the range of these cannons, one can refer to the contemporary treatises (Parrino, 1725). The half colubrine could reach about 470 steps and the *sacre*, 900; that is 650 m and 1250 m of maximum range (1 step = 1.393 m). From which follows that the original defensive function of these Towers is not the artillery but the visibility. However, in 1633 the forts of Posillipo and Nisida were reinforced with new cannons, to the point of this appeared exaggerated to the ambassador of Venice in Naples. In fact, the project of 1635 reports that the cannons of Nisida "shoot far". Only with royal artillery (more than 25 pounds), a



**Fig. 11** Defensive analysis of Nisida Tower (A) in the 16th and 17th centuries. The small radius is the range of half colubrine (470 steps, 650 m) and the bigger radius is the range of a *sacre* cannon (900 steps, 1250 m). The shots of Nisida could be crossed with those of Posillipo Cape fort or battery (B), placed in the promontory and cited by historical sources. Finally, the fort of Gaiola (C), which was afterwards built, completed the defense of this part of the coast.



**Fig. 12** Map of the coastal defenses of the Tyrrhenian Sea in 1613 (Biblioteca Nazionale di Napoli Vittorio Emanuele III. BNN, ms.XII.D.1).

longer distance could be reached in the beginnings of the 17th century. But this kind of cannons was generally placed in the main castles, not in small Towers as Nisida one: for this reason, Nisida had become an important defensive point and the defense of the island became part of the preoccupations of the governors.

Fig. 11 shows the defensive analysis of Nisida Tower. The “ranges” of the 16–17th centuries are calculated from the batteries of Nisida, Posillipo and Gaiola. The small radius is the range of half colubrine (470 steps, 650 m) and the bigger radius is the range of a sacre cannon (900 steps, 1250 m). The shots of Nisida (point A) could be crossed with those of Posillipo Cape fort or battery (point B), placed in the promontory and cited by historical sources. Finally, the fort of Gaiola (point C), which was afterwards built, completed the defense of this part of the coast.

## 5. The new of Nisida in the seventeen century

In the first catalogues of castles and Towers for the territory defense and control, the island of Nisida was not included. For example, in the *Descrittione del Regno di Napoli*, the author offers a list of the castles and Towers which from earth and sea protected the province of Terra di Lavoro (Mazzella, 1586) without mentioning Nisida. This means that, in origin, Nisida is not understood as part of the system built by the Vice Kingdom. However, the island was crucial to avoid disembarkation in Bagnoli, Posillipo or Mergellina. For this reason, in the 17th century the fort was reinforced with artillery by the vice King, the Count de Monterrey. The National Library of Naples (Biblioteca Nazionale di Napoli) keeps a map dated in 1613 with all the Towers and castles along the coast from the cape of Circeo to Agropoli (Fig. 12). In this map, Nisida is already included. In fact, in the seventeenth century, Nisida became an important and strategic point. In 1635 a faro project over the Tower of Nisida was done by Bartolomeo Picchiatti, Mayor Engineer of the Kingdom (Buccaro, 2017). According to this project, the fortifications of the island were also

enlarged with a new fort over the East port. The fact of the vice king developed the fortifications in that of which in the past was a private Tower, demonstrates the importance acquired within the defensive system.

The project of the faro was never built. In the plan kept in Simancas General Archive (Spain), we can read that the faro and the little fort near the harbor “have to be built” (Fig. 13) (Archivo General de Simancas, 1635). This plan is essential because it provides valuable information about the importance of the Tower of Nisida around this date. It became part of the coastal fortified system, and the promontory of Posillipo in front of the island, where there was a small fort. In the mentioned project of 1635, it is drawn a small square and two-story Tower, with scarp and the legend of *Monte di Posillippo che cobina alla sinistra dell'ysola* (i.e. Posillipo that combines crosses fires at the left of the island of Nisida). In the *Nuova Guida ... di Napoli* (Parrino, 1725) we can read that the promontory in front of Nisida, called Coroglio, *si suole munire in occasione di Guerra* (i.e. in case of war, Coroglio was armed whit artillery).

The defensive function of Nisida and Posillipo became fully operational a few years later. On 16–23 September 1640, the French navy tried to disembark by surprise hoping to provoke a popular revolt. The first attack was avoided by the decapitation of the Prince of Sanza, who was accused of intriguing (Russo, 1989). These attacks obliged to the kings to fortify the marine and the islands. The role of Nisida was important because, without the presence of fortification, the island can be easily used as a secure harbor to be hidden after a surprise attack in Naples.

The French navy tried to hide behind the island to attack Naples, but the castello di sopra, as the Tower of Nisida was called in that years, was well defended and avoided the attack. This happening is important, because the strategic relevance of Nisida lies not only with the visibility but also on the fact that if the island were not well defended, it would be a weak point in where an enemy could attack by surprise the city of Naples, both by sea and by land, after a disembark. Military history teaches how important it is to have protection in the coasts around of a great city, because attacks against a strategic harbor or coastal city rarely came from sea: most of the time it is done from land part after a disembark in a closer point.

The artillery of Nisida was increased and employed during the attacks and riots of 1648, when the vice king was the Count of Oñate, as the documentary sources tell: “(French navy) appeared the following morning in the Cape of Posillipo, and from the Mount of this name, as from the Castle of the Ovo, and from the Islet of Nisida the artillery fulminated against it” (Mauro, 1998).

As already seen, the Tower of Nisida was not built, at first, as part of the system. Perhaps, due to this visibility capacity, it was quickly considered and employed as an essential part of the system.

### 5.1. The control of the city

The visibility from Nisida and Posillipo to the sea and inland, i.e. towards Vomero hill where Castel Sant’Elmo is placed, allows controlling of the city.



Fig. 13 The project of a faro and a new fort in Nisida in 1635 (Simancas General Archive, Spain. AGS, MPD-07-069).

In this sense, the analysis of the historical maps and drawings lets valuable information. We know that in the middle of the 17th century there was a way from Posillipo cape and Sant’Elmo castle. There are several views and plans of that years where Nisida can be seen (De Seta, 1969). For example, in the drawing of 1648 made by Petrus Miotte, under the number 52, there is signed the *Fortino tenuto*

*dal’popolo al capo di Posilipo á di qui vi scorrono per il monte sino á vomero et al.l’altra parte della città*, i.e. “little fortress taken by the population (in the riots of 1647–1648), from here they are helped across the mount towards Vomero and the other part of the city” (Fig. 14a).

Consequently, this is the way by which Nisida Tower is the keystone between two defensive subsystems: Baia and

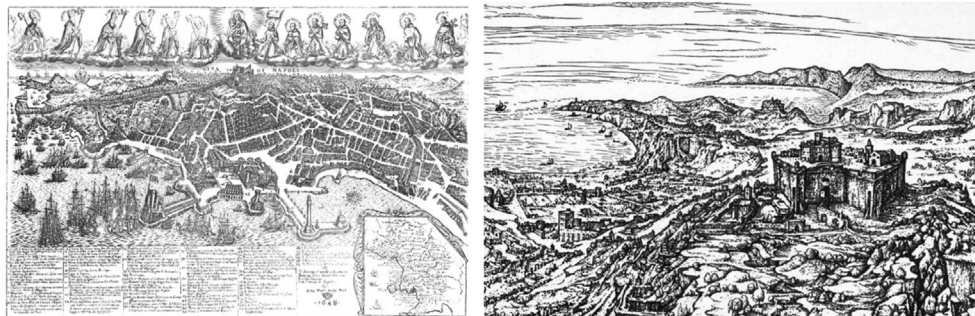


Fig. 14 a) Petrus Miotte, 1648. Detail of the view of Naples with the way from Posillipo Cape in front of Nisida towards the castle of Sant’Elmo, over the Vomero hill; b) detail of the view of Naples by Jan van Stinemolen, dated approximately 1582, with focus on the relationship between Nisida and Sant’Elmo.



Fig. 15 Views from Nisida towards Sant'Elmo and vice-versa.

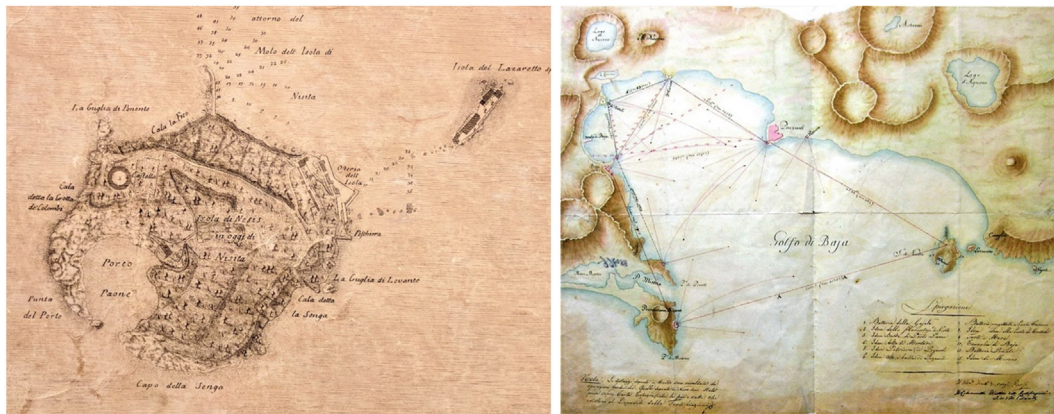


Fig. 16 a) Topographic map of 1769 (Niccolò Carletti, Mappa topografica di Napoli) that shows the plan of the Tower, the path and the external stairs to enter the castle; b) Military map of the bay of Baia in 1813 (Naples National Library).

Napoli. Geographically, the island is included in the bay of Baia. The Posillipo promontory blinds the two subsystems: there is no connection amongst the bay of Baia with that of Naples better than the visual communication between Nisida and Sant'Elmo (Fig. 15). The historical cartography of Naples several times shows this visual relationship, as in the drawing of 1582 that represents a view of Naples by Jan van Stinemolen (Fig. 14b), stored at the Albertina Museum of Vienna.

At last, Nisida was reinforced several times more, during the 18th and 19th centuries. The island defenses were completed with the batteries of Porto Paone and another battery was built in Gajola to combine fires with Nisida (Russo, 1989) (Fig. 16a). However, after the Napoleonic govern, the Tower lost his function, perhaps due to a decrease in sea attacks or pirate raids, and it was reconverted into prison, and deeply transformed in the morphology. Fig. 15b represents a military map of 1813 in where the ranges of the cannons are drawn from the castles of Pozzuoli and Baia and the new projected coast batteries, but not from Nisida: at this time, in fact, Nisida has lost its artillery importance, even if it maintains a little relevance as observatory and, several years after, the Tower was destined as prison. Finally, in the 20th century, half of the Tower was demolished to build new rationalist buildings for the prison.

## 6. Conclusions

As it is known, the defensive systems born and developed as an organic entity: they can be increased, reinforced, or even cancelled along the time depending on the circumstances, the politic, the external hazards and the technological development of the warfare. The paper tells the way in which a Tower, which was initially not part of a designed fortified plan, was included in it as fundamental hub, in a few years.

The primitive Tower of Nisida was considered a fortified recreational palace, but it was placed on a strategical point, whose position could improve Naples city's defenses. For this reason, along the 17th century, the Tower was reinforced with artillery and new projects of forts were developed. On urban scale, its visual range is very long, while on local scale, Nisida could protect the coasts near Posillipo Cape and could quickly communicate by visual signs with Sant'Elmo castle. The war episodes lived in the surrounding area of the Tower and the historical sources corroborate this assertion that the island functioned as a key piece between the fortified subsystems of Baia and Naples.

When Spanish governors of Naples kingdom defined and developed the city defense, they used previous fortifications and built another new one, updating the defense

system. The Swabian-Angevin and Aragonian castles were reinforced and remodeled to the new artillery necessities, acting as the main fortresses of the whole system. Many new watchtowers were emplaced along the coastline. The case of Nisida straddles the gap between these situations: it was an old private Tower that, in the first stages of the Naples fortification was hardly considered, beyond its use as sighting tower. However, due to its position and its possibilities to become a guard outpost and not just a sighting outpost, it was highly reinforced with the most powerful artillery (artillery that a standard watchtower did not usually have) and its status changed, defining an important updating of the fortified system of Naples.

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## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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