# THE MONASTIC HERITAGE IN THE SARONIC GULF (GREECE). ARCHITECTURAL AND ENVIRONMENTAL SURVEYS OF THE ARCHITECTURE AND COASTLINE

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**Abstract** – The research itinerary is aimed at getting to know the monastic complexes in the Saronic Gulf (Greece) with operations of an investigative nature, to which are added references on religious and environmental themes which, in relation to architecture, expose the compositional and structural beauty of the Greek coastline. They are readings of structures that refer to the territory with analyses that determine knowledge suitable to be represented and documented in the main dimensions of the research.

The final objective of the research is to promote the development of the territory through the protection and enhancement of the architectural and cultural resources present.

The study presents the survey of some Monasteries in the Saronic Gulf in southern Greece, such as the Monastery of the Spring Fountain on the island of Poros, the Monastery of the Assumption of the Virgin Mary on the island of Hydra and the Monastery of St. Nicholas in Spetses. These architectural structures present a poor graphic and iconographic documentation, therefore the research, through some manual and instrumental surveys, proposes a knowledge of the places through drawing.

The activities of investigation of the religious architectures have foreseen several survey campaigns aimed at the knowledge of the structures and the surrounding territory: the graphic analyses, in fact, have produced a first geometric model subsequently enlarged with architectural details. Adequate photographic documentation was also carried out, in addition to checking the scarce bibliographic, archival and iconographic documentation.

## Introduction

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Figure 1 - The Monastery of the Spring Spring on the island of Poros. View from the west coast.

An adequate photographic documentation has also been carried out, in addition to checking the poor bibliographic, archival and iconographic documentation. In this system of representation, the photographic image, in addition to constituting a database value which can be drawn on even after the survey phase, the possibility of interpolating this static figurative data with dynamic computer elements is evident.

For the knowledge activities, we have taken into account the Ryobi laser instrumentation applied on a portable computer support, both tablet and smartphone, which allows an immediate vision of the relief data on the photographic image taken from the support, transforming it into a dynamic data. The support of this photographic technology becomes the main surveying tool because it contains both the measurement data and the geographical coordinates connected to the device used, as well as information regarding the date and time of the survey campaign.

The Saronic religious complexes are proposed, in this path of knowledge, in their current religious functions and in their configurations rich of interest on the analysis of their respective architectures: community buildings, churches, service structures, cells.

The architectural installations display harmonious lines grafted into the urban complexes or into the natural greenery that envelops them in an aura of contemplative participation that is also testified by recent photographic footage of a useful approach to knowledge of the complexes in the landscape.

Of the Monasteries under examination, the dimensions, the open and closed spaces, the geographical configurations in their specific regularization of the sacred perimeter destined to the hermitage of the community factories and the pertinent church have been noted. Of the three complexes under examination, the knowledge of the current aspects, of their uses, is tackled through manual and instrumental surveys, graphic returns compared to archive drawings that attest to their past function.

## The monastic architecture in the Saronic Gulf

In order to analyse the monastic architecture in the Saronic Gulf, it is essential to analyse the bibliographic and historical sources as well as a brief description of the structures.

The Monastery of the Spring Fountain, located on the island of Poros in a thick pine forest not far from the city centre of the same name, was founded in the 18th century near the only local fresh water spring which, as local legends tell, miraculously healed the Archbishop of Athens in 1720. A mystical place, recognized in 1733 by the Patriarch of Constantinople under his own jurisdiction from which he obtained numerous economic privileges, in 1814 it hosted a group of monks from Mount Athos who contributed to the architectural and spiritual growth of the place. A few years later, within the premises on the ground floor, the first orphanage of the Greek nation was founded for the orphans of the warriors of the War of Independence.

Currently the Monastery consists of a building with a central courtyard in which stands the Church with a dome and a bell tower. The double level hermitage has in the lower part the service rooms such as a refectory, kitchens, storerooms and rooms for the reception of the faithful, and in the upper part the monks' cells, 17 of which are occupied.

The Monastery of the Assumption of the Virgin Mary located on the island of Hydra, also occupies a dominant position over the port overlooked by the ponderous clock tower. Documentary sources identify a first religious complex already in 1643 consisting of a central church and a nucleus of cloistered cells of the 18 religious women.

The structure was destroyed in 1774 by a violent earthquake and rebuilt in the following years with Venetian architectural influences deriving from the Serenissima domination in the Mediterranean.

The same type of building, named after the Assumption of the Virgin Mary, however, was entrusted to a group of Orthodox monks.

The Cathedral, in Byzantine style, has three naves ending in three semicircular apses with frescoes from the 18th century: the interior preserves numerous icons in gold and silver from the Byzantine period and in the centre of the central dome hangs an imposing gilded chandelier.

In the monastic enclosure there are two bell towers, the first, dating back to 1643 and remodelled in 1806, on three levels is covered in marble and was designed by Venetian and Genoese architects for the previous women's monastery, the second, larger, dating back to 1874.

Figure 2 - The Monastery of the Assumption of the Virgin Mary on the island of Hydra. View of the religious structure and the port.

Currently the side courtyard houses the busts of some of the heroes of the Greek War of Independence of 1821 against the Turkish people, in memory of the transformation of the religious structure into a military quarter: the monastic cells, in fact, were used as chambers for admirals and captains who managed the military attacks against the Near East.

The Monastery of St. Nicholas in Spetses, finally, is located along the northern coastal strip of the island and in 1821 it represented the political, as well as religious, center of the local community. In fact, during the War of Independence, it was the place where battles and military strategies were agreed upon by captains, lords of the island and priests.

The main entrance portal, facing west, is characterized by a ponderous entrance portal surmounted by the bell tower built in 1805 with marble from the island of Tinos.

The entire complex on a double level with a central courtyard and a church with a nave and two aisles is characterized by a floor made of sea pebbles arranged according to a geometric design.

Towards the east the building is characterized by a single floor, the ground floor, while on the first floor there is a panoramic terrace overlooking the surrounding gulf where there is a portico leading to the monks' cells.

Figure 3 - The Monastery of St. Nicholas on the island of Spetses. View to the east from the sea.

## The survey and digital modeling of the Monasteries

The research, based on the disciplinary foundations of architectural drawing, proposes the survey and graphic modeling of the structures under examination.

The study has been carried out through detailed and accurate photographic and iconographic documentation, survey and digital documentation. The present work, therefore, proposes to document and reconstruct graphically, the Monastery of the Spring Fountain on the island of Poros, the Monastery of the Assumption of the Virgin Mary on the island of Hydra and the Monastery of St. Nicholas in Spetses, through a series of digital drawings, but above all through 3D photogrammetric modelling systems. The theme of digital modeling is of great importance, since it allows to face, according to disciplinary assumptions, such as technical-instrumental and theoretical applications, the dynamics of drawing related to both traditional and innovative digital representation.

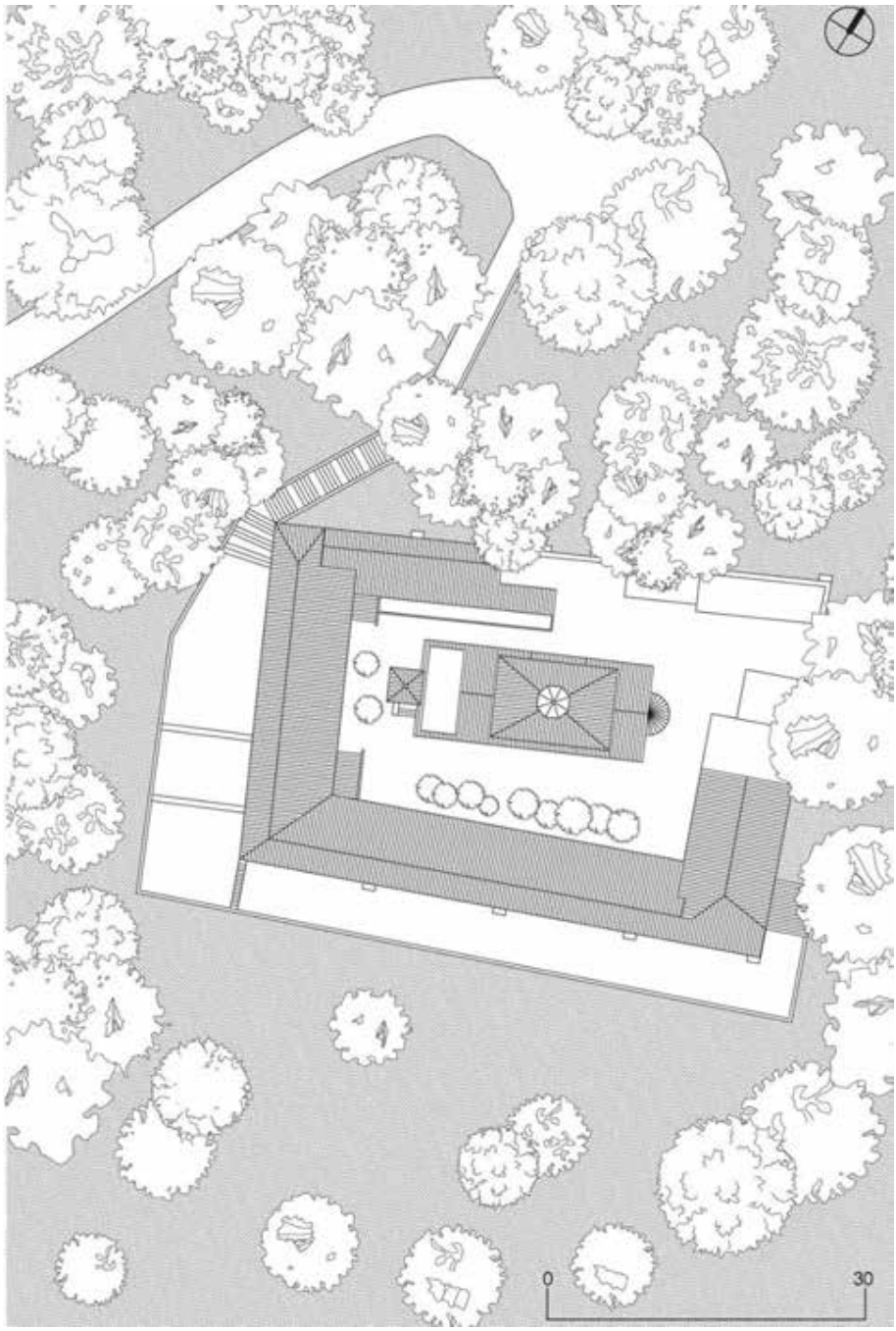

Figure 4 - The Monastery of the Spring Spring on the island of Poros. General plan.

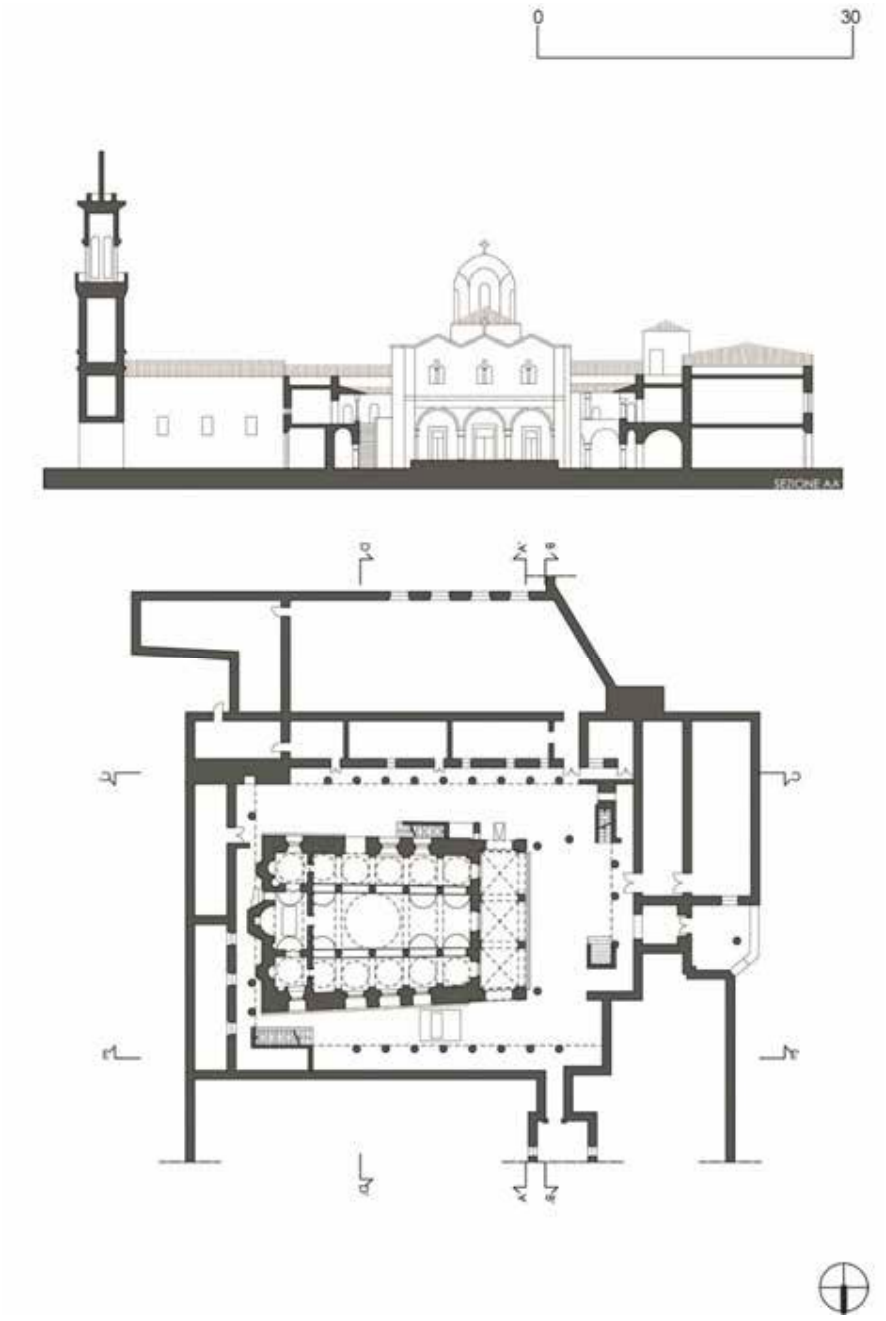


Figure 5 - The Monastery of the Assumption of the Virgin Mary on the island of Hydra. Ground floor plan and transversal section.

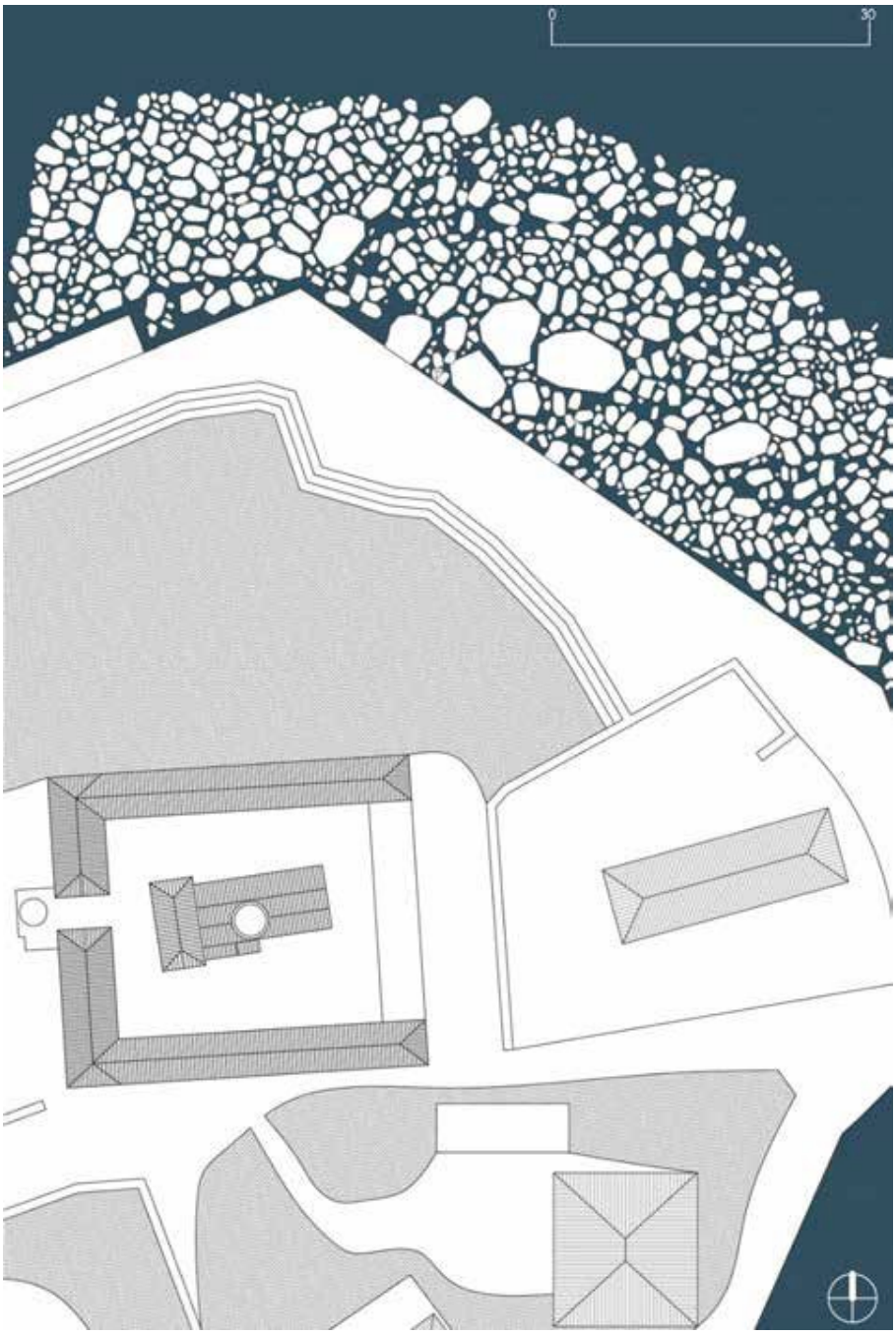

Figure 6 - The Monastery of St. Nicholas on the island of Spetses. General plan of the roofs.

With this science the aspect concerning the visualization is determined, a fundamental element for the communication of the object examined, through which it is possible to define the final graphic rendering compatible with the purpose of the relevant activity, both relative to the knowledge of the existing and indicative for the protection and enhancement of the asset.

Three-dimensional modeling of cultural heritage starting from digital images at different scales and acquisitions with low-cost tools has recently gained attention from the scientific community for the realization of innovative research and advanced digital modeling processes, due also to the availability of new technologies for the recording, processing, management and visualization of 3D data. [Amoruso, Apollonio, Remondino, 2010].

In order to elaborate 3D digital models it is useful to clarify the scientific dynamics that regulate the relationship between architecture and graphic representation. The critical description of architecture, starting from the graphic reading of the typological imprints of the constructions of the past and the morphological configurations, with reference to the discipline of drawing, makes explicit the awareness of the scientific and cultural foundations of representation methods aimed at understanding architecture.

## The photogrammetric image of the Monasteries

For the digital restitution of the Monastery of the Spring Fountain on the island of Poros, the Monastery of the Assumption of the Virgin Mary on the island of Hydra and the Monastery of St. Nicholas in Spetses, photogrammetry plays a role of considerable interest, as the images taken from digital cameras contain the information for the realization of models, the campaign is quick and reduced to the shooting of photographic images often at low cost. As is well known, photogrammetry is the science that allows to obtain accurate measurements from photographs by transforming two-dimensional information into three-dimensional measurements [Manfredini, Remondino, 2010].

Photogrammetry, therefore, in the context of this applied research, has the task of establishing a graphic and geometric relationship between the images taken on site and the object of survey in a photographic shot. The photogrammetric technique allows, therefore, to determine technical information to make metric measurements on the size, shape and position of the object starting from measurements taken on images taken from both fixed and mobile supports.

It is useful, for this research, to mention the field of passive optical sensors, as instruments such as cameras that are used to capture the reflection of natural light on the surface of the object to be detected and, if at least two images with two different points of view are used, they trigger a stereoscopic vision of a surveying object similarly to what happens in human vision.

## Conclusion

The contribution, through manual and instrumental surveys, outlines the architectural features of the Monastery of the Spring Fountain on the island of Poros, the Monastery of the Assumption of the Virgin Mary on the island of Hydra and the Monastery

of St. Nicholas in Spetses. These structures were erected between the mid-seventeenth century and the second half of the following century, of which few documents remain of their original spatial configuration in the context of the places, proposing, today, interesting perceptions, research and analysis. Even the urban or natural environment that surrounds them remains full of charm, with visions of the city and the sea from the chosen settlement in an emerging position with respect to the cities.

The progress of the research can be identified in the methodologies used and in the experimentation among the various instruments in possession. The use of interactive software for graphic restitution, digital representation and 3D modeling has allowed the knowledge of the current aspects, of the uses that attest their past function. The determination of a scientific procedure, usable on other architectural artefacts, has determined a further element of the research.

## References


[1] AA.VV. (2004) - *Spetses*. Atene: Micheal Toubis Publication.

[2] AA.VV. (2014) - *Holy Monastery of the life - Giving Spring*. Poros: Monastery press.

[3] Amoruso, G., Apollonio, F., I., Remondino, F. (2010) - *Caratterizzazione strumentale di sensori attivi a tempo di volo e a triangolazione. Utilizzo di laser scanner su superfici marmoree di epoca romana*, Scuola Normale di Pisa.

[4] Apollonio, F., I. (2010) - *La modellazione digitale*, Bologna, Clueb.

[5] Barba, S., Cardone, V. (2013) - *Modelli grafici dell'architettura e del territorio*, Santarcangelo di Romagna, Maggioli.

[6] Bertocci S. & Bini M. (2012) - *Manuale di rilievo architettonico urbano*. Torino: Città studi edizioni.

[7] Bianchini, C. (2011) - *Rilievo Modellazione e Studio Geometrico delle Cupole*, Roma, Edizioni PreProgetti.

[8] Brusaporci, S. (2007) - *Modelli interpretativi dell'architettura me*dievale, L'Aquila, Arkhè.

[9] Capone M. (2012) - *Geometria per l'Architettura*. Napoli: Giannini Editore.

[10] Corniello, L. (2019) - *3D surveying and 3D reconstruction of architecture of the Royal Park of Tirana*. The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, XLII-4/W18, 241–246, 2019

[11] Guter, J. (2008) - *I monasteri cristiani*. Roma: Edizioni Arkeios.

[12] Loudon M. (2018) - *Hydra. An Island and its architecture*. Vienna: Phoibos Verlag.

[13] Manfredini, A., M., Remondino, F. (2010) - *Modellazione 3D da immagini. Pipeline fotogrammetrica*, Scuola Normale di Pisa.

[14] Messina B. (2012) - *The domes of the Amalfi Coast: survey and digital representation of complex shapes*. Firenze: Nardini Editore.