

**ESTUDOS
DE HIDRÁULICA
MONUMENTAL**

CIRCUITOS E EQUIPAMENTOS DA ÁGUA



Odivelas
CÂMARA MUNICIPAL

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ESTUDOS DE HIDRÁULICA MONUMENTAL: CIRCUITOS E EQUIPAMENTOS DA ÁGUA

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Coordenação

JOANA BALSA DE PINHO, MADALENA COSTA LIMA,
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THE CONSTRUCTION OF A 16TH CENTURY WATER SUPPLY SYSTEM IN THE CONVENT OF VILAR DE FRADES (BARCELOS, PORTUGAL)

A CONSTRUÇÃO DE UM SISTEMA DE ABASTECIMENTO DE ÁGUA DO
SÉCULO XVI NO CONVENTO DE VILAR DE FRADES (BARCELOS, PORTUGAL)

António Pereira¹
Maria do Carmo Ribeiro²

Abstract: The aim of this paper is to analyse the constructive process of one of the hydraulic systems of the Convent of Vilar de Frades, built in the 16th century, whose execution originated a multifunctional route of water use. Through the available sources, it was possible to recover the composition of the entire system, started by the construction of catchment and transport structures in 1595, until the moment it is completed by the placement of a fountain in the 16th century cloister, in 1597. In this process, carried out by the master mason Gonçalo Lopes, it is of particular importance the contract made between the mason and the convent, since it contained all the details about the building process, from the techniques and materials to be used to the obligations of the actors and the work conditions.

Keywords: water resources, hydraulic systems, convents, 16th century, History of Construction.

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Resumo: O presente artigo tem por objetivo analisar o processo construtivo de um dos sistemas hidráulicos do Convento de Vilar de Frades, construído no século XVI, cuja execução originou um percurso multifuncional de utilização da água. Através das fontes disponíveis, foi possível recuperar a composição de todo o sistema, iniciado pela construção das estruturas de captação e transporte, em 1595, até ao momento em que é completado com a colocação de uma fonte no claustro do século XVI, em 1597. Neste processo, levado a cabo pelo mestre pedreiro Gonçalo Lopes, destaca-se o contrato celebrado entre o construtor e o convento, uma vez que continha todos os pormenores sobre o processo construtivo, desde as técnicas e materiais a serem utilizados até às obrigações dos atores e às condições de trabalho.

Palavras-chave: recursos hídricos, sistemas hidráulicos, conventos, século XVI, história da construção.

1. INTRODUCTION



FIG. 1 The location of Vilar de Frades, in the North of Portugal (António Pereira, 2016 – Cartographic base: ESRI, 2013. [Accessed May 2013]. Available on Internet: <URL: <https://www.arcgis.com>>).

The Convent of Vilar de Frades, located in Barcelos (Portugal) (fig. 1), possesses an historical course that encapsulates at least ten centuries of monastic and conventual occupation, where the management of water resources and the investment in hydraulic systems translate different strategies overtime.

Located on the right bank of the Cávado river, in the middle of a rural landscape, the geomorphology of the valley where it settles outlines the shape of an *amphitheatre* facing the river. The complex develops inside a fence that incorporates an area of approximately 9 ha of terrain, organized by the built space in the middle, plain zones of farm to the east and slope zones of forest to the west.

Historically, the known origins of Vilar de Frades are linked to its past as a medieval monastery. The oldest known document to mention the monastery dates from 1059 (FAURE, 2012, p. 21), but it was only in the end of the 11th century that the monastery adopted its first known rule, of St. Benedict (FAURE, 2012, p. 21). With the adoption of the Benedictine rule, the monastery went through a temporary phase of growth, importance and development until a period of instability, by the end of the 14th century, which led to a progressive state of decay, abandonment and, consequently, to a period of vacancy, in the beginning of the 15th century. Almost simultaneously to the extinction of the Benedictine monastery, in 1425, the Archbishop of Braga, D. Fernando da Guerra, offered the space to a group led by João Vicente, physician of the Portuguese Kingdom (PINA, 2011, p. 76-80), who promptly occupied the monastery and transformed it into a convent. Once in Vilar de Frades, the group founded the Congregation of Secular Canons of St. John the Evangelist, popularly known as *Loios*, and began to develop a mission focused on the evangelization and assistance to the population. Their mission only came to be ceased in 1834, with the extinction of religious orders by the Portuguese government and the consequent abandonment of the convent.

At par with the historical events, and, at least, between the 13th and the 19th centuries, the complex went through a constructive evolution which contemplated several constructions and reconstructions inside an almost continuous expansion of the built space (PEREIRA, 2020). Although there isn't any approach exclusively focused on the management of water resources in Vilar de Frades, the general perspective of the evolution of the structures related with water has been accomplished through different studies that partially include the convent's built space (FAURE, 2012; VINHAS, 1998), as well as the surrounding area (MATOS, 2001).

Regarding the hydraulic structures, the different uses of water, known at least from the 16th century, turned into different investments made by the convent. In other words, on one hand, it is distinguishable an action focused on the water supplying of the convent through building infrastructures, like pipeline, taps, washbasins and fountains (VINHAS, 1998, p. 115-116), which have integrated the systems of catchment, transport and distribution and were used for consumption, hygiene and farming. On the other hand, it is also visible a procedure of acquisition and improvement of structures related to fluvial resources, of the Cávado river, on whose banks had long existed buildings designated for fishing and for processing farm products (mills) (MATOS, 2001, p. 149-157).

Inside this timespan, more than providing an overview of the use of water in Vilar de Frades between the 16th and the 19th centuries, the present approach focuses on the construction of a water conduit in the end of the 16th century, whose analysis constitutes an important perspective about the convent's investment on water infrastructures, as well as the technology applied in water management. This way, while engaging a multidisciplinary approach and based on the cross of different historical sources, we proceeded in the analysis and interpretation of the water conduit edified outside the convent on the 16th century, including aspects like its structure, materials, the constructive process, and other aspects related to the construction of hydraulic systems in monastic and conventual houses.

In concordance to its cultural and historical potential, Vilar de Frades also constitutes a privileged place for other research areas that deal with cultural heritage. Being an absolute reference of the legacy of the Portuguese religious orders and a national monument since 1910 (DECRETO-LEI de 16 de junho de 1910. *D. G. I Série.* 136 (1910-06-23), ZONA ESPECIAL DE PROTEÇÃO, PORTARIA n.º 398/2014. *D. R. II Série.* 103 (2014-05-29)), the intention of the present investigation is also to put in perspective the potential generated by historical and archaeological research in this site. The reading and interpretation of Vilar de Frades as a site that expands itself outside the physical area of the convent, that interacts with the landscape and foments of places of collective significance, enable it to be perceived as a potential place for tourism and creative industries.

The importance given to water and the investment in water related structures are a common trace in monastic and conventual houses from both

the medieval and the modern period. The use and management of hydric resources in the religious houses that densely occupied Europe's landscape consisted in an incessant need for water that wasn't always available. When the natural conditions were insufficient or did not permit water catchment inside the area of the monastery or convent through wells, other forms started to arise to get water to the convent's fountains, kitchens, latrines and to irrigate the fields (QUINTELA et al., 1996, p. 352).

At the same time, the exploitation of the driving force generated in courses of water like rivers and other streams led to an increased use of mills and other processing machines that marked the development of hydraulic technology in monasteries (HOLT, 2000, p. 95-97). Because water resources are a fundamental part of a site's habitability, one of the procedures on the study of this subject is through the actions and remains of the structures related to water. However, sometimes these structures can be hard to record or to analyse, because they are not conceived to be visible. Elements like fountains, taps or basins are often the sole visible part of a much more complex system that develops under the ground and inside the walls, making them an analytical challenge through a non-intrusive approach.

Under the referred premise, the conception of a non-intrusive approach required a multidisciplinary methodology able to combine the assumptions of Archaeology of Architecture and History of Construction. From the acknowledgement of historical buildings as an aggregate of human actions over time, the interpretation of each materialized action stratified in the different chronologic and cultural contexts is enabled by the analysis of different types of sources that are related to the evolution of the historical building. The availability of sources such as the material remains of a construction, the written and documental sources or even the graphic information make it possible to mount the strategy most suited for the analysis and studying of an historical structure (AYÀN VILA, BLANCO ROTEÀ e MAÑANA BORRAZÁS, 2003, p. 6-7).

In the case of Vilar de Frades, the necessity of this convergence towards the study of monastic and convent building construction is inserted in the aim that is the analysis of the constructive evolution, through the characterization of the constructive process, the materials used, and the role of the human actors involved. The potential of this type of approach has, until

now, enabled the revaluation of aspects like the constructive process of the church's nave between the 16th and the 17th centuries (PEREIRA e RIBEIRO, 2016), or the analysis of wood materials and beam systems of the 16th century cloister (PEREIRA, 2017).

For the study of water resources in the Convent of Vilar de Frades, the approach contemplated unsystematic archaeological surveys interlaced with documental analysis to interpret the construction of a water conduit in the 16th century. Although centred in the structure as a primary source, in the group of the manuscript sources it is important to emphasize the contract of the 16th century that details the process of construction of the conduit (MAURÍCIO, 2000, I, p. 291-294). Another documental source, the *Epílogo e compendio da origem da Congregação de Sam Joam Evangelista & do nascimento, vida, & morte dos seus três fundadores* (ARQUIVO DISTRITAL DE BRAGA, Fundo monástico-conventual, ms. 924, padre Jorge de São Paulo, *Epílogo e compendio da origem da Congregação de Sam Joam Evangelista & do nascimento, vida, & morte dos seus três fundadores*, 1658), started in 1658 by Father Jorge de São Paulo, constitutes a fundamental chronicle for comprehending most of the construction phases that occurred in the convent and particularly for the comprehension of the conclusion of the system here under analysis.

2. THE CONSTRUCTION OF A WATER SUPPLY SYSTEM IN THE 16TH CENTURY

In the beginning of the 16th century, started in Vilar de Frades a constructive period that went through a quite extended part of the century. The constructive renewal covered the construction of the main buildings of the convent, constituted by the church and the cloister, under the architectural movement of the Portuguese Late Gothic *Manuelino*.

By the end of the 16th century a water system was implemented in the convent's south cloister, whose contract (ARQUIVO DISTRITAL DE BRAGA, Fundo monástico-conventual, São Salvador de Vilar de Frades, liv. 20, fls. 194-198 (transcription in MAURÍCIO, 2000, II, p. 291-294)) is preserved in the district's archive of Braga. This agreement, established between the rector of Vilar de Frades, Father Baltazar de Cristo Sodré, and the master mason Gonçalo Lopes de Guimarães, despite its value for the hermeneutics

of the law of the 16th century, appears to us as an important source to include in the analysis of several aspects concerning the water system.

In terms of the structure, the contract covers different aspects related to the construction of this conduit. In first place, while beginning to start describing the conduit, it is very specific about the location of the sources used for the water supply. In the text of the document, it is stated first that the conduit would logically begin in the source location, a place identified as “bareyros” and located in the old parish of “S. João d’areas” (ARQUIVO DISTRI TAL DE BRAGA, Fundo monástico-conventual, São Salvador de Vilar de Frades, liv. 20, fl. 194 (transcription in MAURÍCIO, 2000, II, p. 291-294)). Crossing this information with the present toponymy of Areias de Vilar, the location of the water spring should be in a place now identified as Barreiro or Barreiros, that in fact overlaps part of the area of the old parish of São João de Areias (figs. 2 and 3).

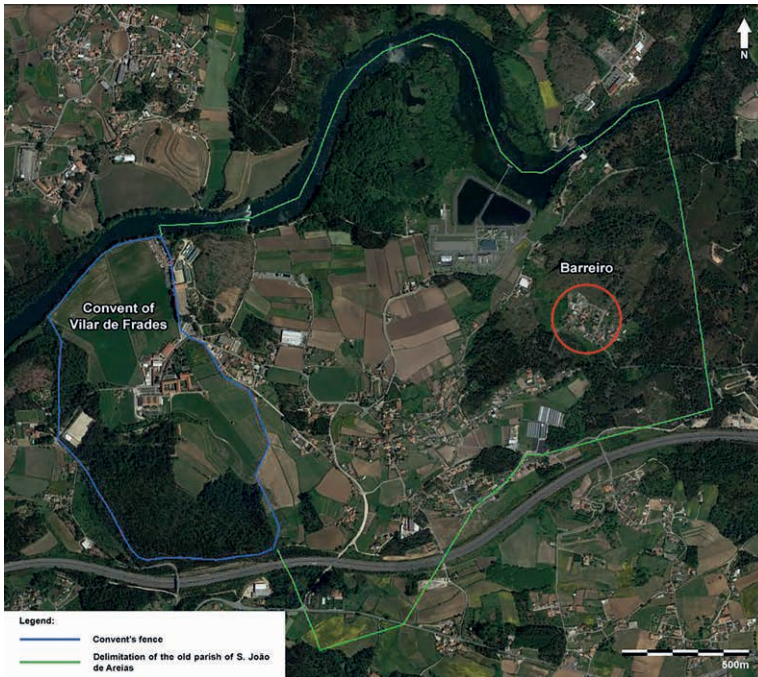


FIG. 2 Location of the place of Barreiro in relation to the convent (António Pereira, 2016 – Cartographic base: Google Earth 7.1, 2016. Areias de Vilar. 3D buildings data layer. [Accessed May 2016]. Available on Internet: <URL: <https://www.google.com/intl/pt-PT/earth/versions/>>.



FIG. 3 View of the urbanized focus in the place of Barreiro from the west side (António Pereira, 2016).

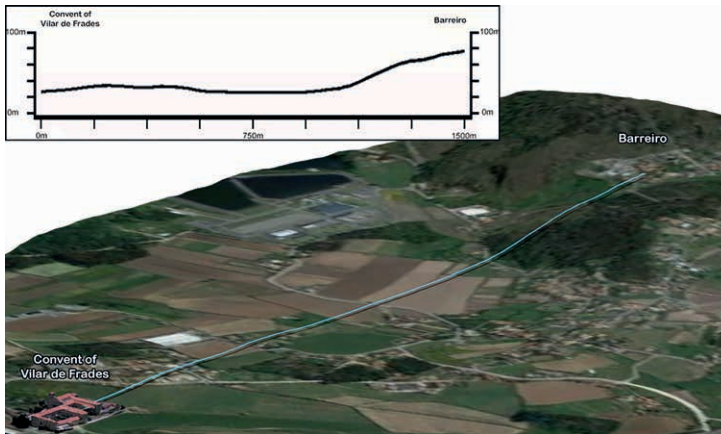


FIG. 4 The proposed route for the conduit and its height graph (António Pereira, 2016 – Cartographic base: Google Earth 7.1, 2016. Areias de Vilar. 3D buildings data layer. [Accessed May 2016]. Available on Internet: <URL: <https://www.google.com/intl/pt-PT/earth/versions/>> [Accessed May 2016]).

Beyond the geographical coincidence, it is important to highlight that the marked area distances approximately 1,5 km from the south cloister of the convent, being possible to assume that the conduit length would be be-

tween 1,5 km and 2 km. Also, the proximity of this area to the mount Penide shows that the outline of the relief between the mount and the convent was topographically suited for the implantation of a water conduit. The outline displays the place of caption at a height proximal to the 80 m mark, and then a little prominent descent, providing the necessary inclination towards the convent, placed at the approximately height of 24 m (fig. 4).

As for the identification of remains from the 16th century water system, near the place of Barreiro there are evident traces of a subterranean water system, perceivable by the presence of a community water tank and the nearby Fountain of Loureiro. However, due to the fact this place of Barreiro has been densely urbanized and strongly impacted by contemporary constructions, the result of the survey made was inconclusive in identifying a water source specifically called Barreiro or Barreiros, as well as other remains undeniably related to the conduit.



FIG. 5 A view of the agricultural impact on the valley bottom (António Pereira, 2016).

Between the catchment site and the convent, the contract suggests that the conduit would have to pass through farming areas and cultivated fields, portraying a landscape of intensive farming that is still present (fig. 5). In fact, the proposed location for the conduit increases the probabilities that the remains of the conduit have been subjected to actions of removal, reuse or even dislocation. However, the trace seems coherent with a written memory that states that during the 20th century, when the primary school

was under construction, clay pipes were found and identified as a part of the convent's conduit (MATOS, 2001, p. 155-156).

The contract is also very detailed about the composition of this conduit, being possible to divide three distinct parts or functions: catchment, adduction, and distribution, a system which was on a par with the layout of the medieval monasteries (JORGE, 2020, p. 13-14)³. The first part of the system built in Vilar de Frades was related to collecting the water in Barreiro. Specifically, to collect the water it should have been built "huã arqua" (an ark) made of stone, over the spring, destined to protect the catchment site (ARQUIVO DISTRITAL DE BRAGA, Fundo monástico-conventual, São Salvador de Vilar de Frades, liv. 20, fl. 194 (transcription in MAURÍCIO, 2000, II, p. 291-294)). The "casa das águas" (house of waters) of the Convent of Capuchos (Sintra) (JOSÉ, 2013, p. 33) or the structure of the Monastery of São Dinis e São Bernardo, in Casal Ventoso (Odivelas) (JORGE, 2018, p. 38), are structures possibly similar to the ark referred in the contract of Vilar de Frades. Also, in the city of Braga we find references of a "caixa geral das águas" (general waters box) made of stone, integrated into an urban house. This stone water ark had a large stone arch inside, through which the water entered. Water from different places flowed into this box, and from it the water was redistributed to the urban centre, namely to some convents that existed in the city in the Modern Age (RIBEIRO e MARTINS, 2012).

In Vilar de Frades, once inside the ark, water would be collected onto a basin through a "dalla", a term used to designate a chute found in ships conceived to drain water, and from there would reach the pipes connected to the convent (ARQUIVO DISTRITAL DE BRAGA, Fundo monástico-conventual, São Salvador de Vilar de Frades, liv. 20, fl. 194v. (transcription in MAURÍCIO, 2000, II, p. 291-294)). In terms of construction, the ark would have strong walls, good ashlar and be well mortared and grouted, except in the first line of ashlar adjacent to the veins, which should be dry and without any lime or clay, to avoid any obstruction or contamination of the water. The plant of the ark would be round and display a height able to lodge a standing

³ The work of Virgolino Ferreira Jorge has been an essential contribution for the study of the management, structures, and uses of water in medieval and modern monasteries in the Portuguese territory, with emphasis on Cistercian monasteries.

man. The top would be covered and well mortared to avoid any rubble to come inside. As for the entrance, it would be made a portal with its height and width being determined by the convent's rector (ARQUIVO DISTRITAL DE BRAGA, Fundo monástico-conventual, São Salvador de Vilar de Frades, liv. 20, fl. 194v. (transcription in MAURÍCIO, 2000, II, p. 291-294)).

Once passed the ark, the water would be adducted through a pipe made of modules in clay⁴. The pipe would run inside two walls measuring 1,5 to 2 palms and probably be mortared with lime or clay, as to be determined by the convent's rector (ARQUIVO DISTRITAL DE BRAGA, Fundo monástico-conventual, São Salvador de Vilar de Frades, liv. 20, fl. 195 (transcription in MAURÍCIO, 2000, II, p. 291-294)). The inside, besides the pipe, would also be filled and mortared with clay, except in the parts where the rector would want them in lime. The conduit would then be sealed with stone slabs along the top to cover and protect the clay pipes (ARQUIVO DISTRITAL DE BRAGA, Fundo monástico-conventual, São Salvador de Vilar de Frades, liv. 20, fl. 195 (transcription in MAURÍCIO, 2000, II, p. 291-294)) (fig. 6).

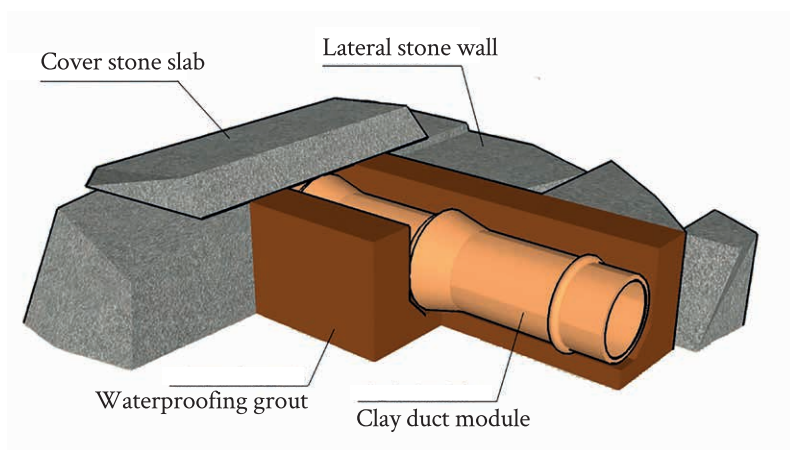


FIG. 6 Reconstitution of the conduit structure outside the convent with clay pipes (António Pereira, 2016).

⁴ Pipes in clay have also been documented, for example, in the Convent of Nossa Senhora da Esperança, in Ponta Delgada (ARAÚJO e OLIVEIRA, 2020, p. 2039).

Due to the extension of the conduit, it was also contemplated in the contract the execution of a maintenance system consisting in the placement of small pits with stone arks at every 20 palms. Exceptionally, when crossing farms or other fields, the distance between the maintenance arks would increase to 50 palms. Each ark would fill a pit with 1,5 palms deep and 2 palms in its inner space (ARQUIVO DISTRITAL DE BRAGA, Fundo monástico-conventual, São Salvador de Vilar de Frades, liv. 20, fl. 195 (transcription in MAURÍCIO, 2000, II, p. 291-294)). Once the conduit reached the convent's wall, its constructive characteristics would change. Just inside the convent's area, adjacent to the fence's wall would be constructed another maintenance structure to distribute water and drain the conduit when needed. Like the first one, this second ark would be a full structure, covered and with a lock on its door. On the inside, it would contain a spirt to drain the conduit (ARQUIVO DISTRITAL DE BRAGA, Fundo monástico-conventual, São Salvador de Vilar de Frades, liv. 20, fl. 195v. (transcription in MAURÍCIO, 2000, II, p. 291-294)).

The ark of the convent's fence also established a transition in the type of conduit, since from there the water would go through a stone pipe instead of the clay pipe, with the individual modules being described as "alcatruzes de pedra [...] furados por dentro" (stone buckets [...] drilled inside) (ARQUIVO DISTRITAL DE BRAGA, Fundo monástico-conventual, São Salvador de Vilar de Frades, liv. 20, fls. 195-195v. (transcription in MAURÍCIO, 2000, II, p. 291-294)). The destination of the conduit was the garden of the south cloister. Once it reached its final stage, it would be distributed by a spirt into a sink where it could be collected. The remaining water was given to waste or as lost (ARQUIVO DISTRITAL DE BRAGA, Fundo monástico-conventual, São Salvador de Vilar de Frades, liv. 20, fl. 195v. (transcription in MAURÍCIO, 2000, II, p. 291-294))⁵ (fig. 7).

⁵ The expression "tora dos synos" is possibly a previous derived form of the popular saying "dar para a corda dos sinos" (giving to the bell's rope), meaning something that was given and/or wasted.

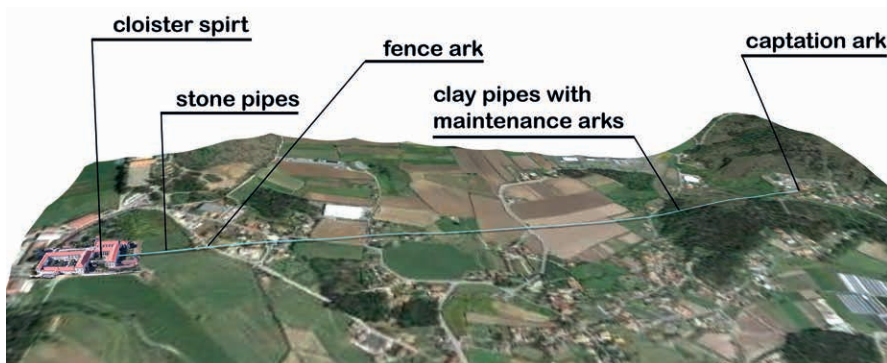


FIG. 7 Reconstitution of the water system based on the information of the contract (António Pereira, 2016 – Cartographic base: Google Earth 7.1, 2016. Areias de Vilar. 3D buildings data layer. [Accessed May 2016]. Available on Internet: <URL: <https://www.google.com/intl/pt-PT/earth/versions/>>.

Being the contract a legal instrument, it was important to include guarantees and obligations for both parts. Representing the convent, the rector of Vilar de Frades was contracting a service, and the builder, represented by himself, was providing the construction of a water conduit through means of a payment. However, as it may be seen, the linearity of this agreement was filled with several nuances and obligations, which in the present time resemble the clauses found on any contract.

On the side of the convent's obligations, the rector of Vilar de Frades engaged the convent in an active participation in the constructive process by providing manual and undifferentiated work. The convent would provide men to open ditches with hoes and transport materials, supply lime, olive oil⁶ and flax waste⁷ to make bitumen⁸ to caulk the conduit and suppress other needs for the construction to be executed (ARQUIVO DISTRITAL

⁶ In 1583, under the administration of the rector, Father Álvaro de Santa Maria, were built the “casas da procuração, do azeite e os celeiros” (houses of the procuration, of the olive oil, and the barns) (VINHAS, 1998, p. 116).

⁷ Upon the extinction of the Portuguese religious orders, in 1834, the Convent of Vilar de Frades owned two flax cleaning machines by the Cávado river (MATOS, 2001, p. 151).

⁸ The fibres of flax, when in contact with water, would absorb it and seal the possible leaks of the conduit.

DE BRAGA, Fundo monástico-conventual, São Salvador de Vilar de Frades, liv. 20, fl. 197v. (transcription in MAURÍCIO, 2000, II, p. 291-294)). About the form of payment, the full amount for the conduit was of 350.000 “reis”, being 8000 reis given upfront. From this initial payment, 4000 reis were to ensure the builder’s commitment with the construction, and the other 4000 reis to the potter that would make the clay pipes. After that, the payment would be done as a salary until the end of the construction (ARQUIVO DISTRICTAL DE BRAGA, Fundo monástico-conventual, São Salvador de Vilar de Frades, liv. 20, fl. 196. (transcription in MAURÍCIO, 2000, II, p. 291-294)). On every holyday, meaning in a weekly basis, the contract terms stipulated that the two parts had to agree if the payment would occur on Saturday or Sunday (ARQUIVO DISTRICTAL DE BRAGA, Fundo monástico-conventual, São Salvador de Vilar de Frades, liv. 20, fl. 196v. (transcription in MAURÍCIO, 2000, II, p. 291-294)).

On the side of the builder’s obligations, the contract required the daily presence of at least 15 official masons on the construction site (ARQUIVO DISTRICTAL DE BRAGA, Fundo monástico-conventual, São Salvador de Vilar de Frades, liv. 20, fl. 196 (transcription in MAURÍCIO, 2000, II, p. 291-294)). Whereas the deadline for the construction would be the first day of Easter in the year of 1596, the construction had to be done according to a list of items composed by the convent’s vice-rector, Father Jeronymo dos Anjos (ARQUIVO DISTRICTAL DE BRAGA, Fundo monástico-conventual, São Salvador de Vilar de Frades, liv. 20, fl. 196v. (transcription in MAURÍCIO, 2000, II, p. 291-294)). As already said, the supply of the clay pipes was a responsibility and an expense of the master mason Gonçalo Lopes de Guimarães, but for the stone conduit the builder oversaw the extraction of the stone, and the convent oversaw its transportation to the construction site (ARQUIVO DISTRICTAL DE BRAGA, Fundo monástico-conventual, São Salvador de Vilar de Frades, liv. 20, fl. 197v. (transcription in MAURÍCIO, 2000, II, p. 291-294)).

It is also remarkable that the builder Gonçalo Lopes, to declare his commitment, had to assure that he would not miss the deadline or abandon the construction unfinished, or all his belongings would go to the convent. Additionally, as if the guarantee of the builder’s belongings wasn’t enough, in case of the builder breaking the agreement and leaving the construction unfinished, the convent had the legitimacy to call another builder and

his associates to finish the construction of the conduit at the expenses of Gonçalo Lopes. In counterpart, if the convent would have failed its obligations towards the master mason, then he would be reimbursed with the convent's rents (ARQUIVO DISTRITAL DE BRAGA, Fundo monástico-conventual, São Salvador de Vilar de Frades, liv. 20, fl. 197 (transcription in MAURÍCIO, 2000, II, p. 291-294)).

In the year of 1596, the rector of Vilar de Frades, Father Baltazar Cristo de Sodré, decided that the cloister was better suited with a fountain whose construction he ordered to the same builder of the conduit, the master mason Gonçalo Lopes (ARQUIVO DISTRITAL DE BRAGA, Fundo monástico-conventual, ms. 924, padre Jorge de São Paulo, *Epílogo e compendio da origem da Congregação de Sam Joam Evangelista & do nascimento, vida, & morte dos seus três fundadores*, 1658, fl. 361). The fountain was finished and placed on the cloister's garden by the Easter of 1597. All that remains from this fountain is the written description provided by Friar Jorge de São Paulo that characterizes it with a square basin in the base, settled on a pedestal of "pedra vermelha" [red stone] in the shape of pillowed diamonds and two bowls with four spouts, each one displaying a frown (ARQUIVO DISTRITAL DE BRAGA, Fundo monástico-conventual, ms. 924, padre Jorge de São Paulo, *Epílogo e compendio da origem da Congregação de Sam Joam Evangelista & do nascimento, vida, & morte dos seus três fundadores*, 1658, fl. 361).

However, the construction of this fountain in the cloister also seems to have been fundamental in the conclusion of the hydraulic system previously constructed. This assumption relies on the description provided by Friar Jorge de São Paulo, when he states that the water for the fountain came from the conduit made of stone that was connected to the ark adjacent to the inside part of the fence (ARQUIVO DISTRITAL DE BRAGA, Fundo monástico-conventual, ms. 924, padre Jorge de São Paulo, *Epílogo e compendio da origem da Congregação de Sam Joam Evangelista & do nascimento, vida, & morte dos seus três fundadores*, 1658, fl. 361). Thus, where the previous system seemed to end there was now a fountain and, from there, two distinct conduits. The water that was not consumed or used in the fountain was divided, and a part followed through a stone conduit towards the kitchen for cleaning purposes (ARQUIVO DISTRITAL DE BRAGA, Fundo monástico-conventual, ms. 924, padre Jorge de São Paulo, *Epílogo e compendio da origem da Congregação de Sam*

Joam Evangelista & do nascimento, vida, & morte dos seus três fundadores, 1658, fl. 361). Another conduit would carry the water to a reservoir located in the yard, called “terreiro dos cabedais”, where it was used for watering the vegetable’s garden (ARQUIVO DISTRITAL DE BRAGA, Fundo monástico-conventual, ms. 924, padre Jorge de São Paulo, *Epílogo e compendio da origem da Congregação de Sam Joam Evangelista & do nascimento, vida, & morte dos seus três fundadores*, 1658, fl. 361).

3. FINAL REMARKS

The management of water resources in Vilar de Frades seems to translate an increasing necessity of water due to the growth and expansion that occurs in the 16th century. The construction of a new domestic space with utilities compartments and dormitories demanded a water system that could provide enough water for subsistence and for the operation of the dependencies. It is under this context of utility that this conduit was thought and built. At the same time, the context of renewal and growth through which the convent has undergone between the 16th and 19th centuries leads us to also consider a corresponding increase in the number of occupants. This possibility could explain the investment made in both supplying the convent with fresh water as well as in infrastructures in the river to retrieve mechanical energy and food.

In another way, the management of water resources also seems to translate a recurring necessity of more water volume over specific periods. The construction phase of the 16th century required a system to replace the water supply of the medieval monastery, in the same manner that the construction of the southwest cloister, between the 17th and the 18th centuries, caused the replacement of the conduit of the 16th century by the aqueduct built on the 18th century (MATOS, 2001, p. 155-157).

The water conduit of the 16th century here in analysis contemplates a very small part of the constructive actions present in Vilar de Frades, when inserted in the general scope of the built space. However, there are certain aspects that are important to highlight and retain from the study of this system. The first one involves the contribution to the comprehension of the planning and construction of water systems in monastic and conventual

houses. Besides the structure itself and the purpose of its use, also relevant are characteristics like the logic of sustainability and the technology applied.

From the perspective of sustainability, only clarified in 1597, with the conclusion of the system, it is an aspect transversal to other religious houses and incorporates the logic of the time in question. As for the hydraulic technology applied, we are facing a simple system mostly underground that took advantage of the features of the relief, while having a very little impact on the landscape.

In the end, the study of a site like Vilar de Frades, and particularly of an element like this conduit, it is also expected to support the emergence of its heritage and cultural value. On the one hand, it is another element that helps us comprehending the heritage left by the Congregation on Secular Cannons of St. John the Evangelist in Vilar de Frades. But, on another hand, the water conduit being outside the convent area constitutes, among other remains, evidence of the interaction between the convent and the landscape.

Monuments like Vilar de Frades have over the last centuries suffered from the current idea of a static monument full of artistic pieces that only proliferate within the building. So, the aim of a multidisciplinary approach is also to detach the idea of a static monument, towards the one of a site that over time has been constantly interacting with the exterior and establishing places of collective significance (PEREIRA e REBELO, 2015, p. 141-142) (fig. 8). Nonetheless, the contribution in this investigation resides on identifying remains and interpreting them in their different contexts, providing a reading of the landscape as whole. However, because information is not *per se* interpretation (TILDEN, 1977, p. 9), it is important to observe the different remains identified in the landscape in their chrono-cultural contexts. Under this perspective, the investigation provided by Archaeology and History can also serve as an enhancer for other activities and provide a social economic output that can be channelled to tourism, creative industries and local businesses.

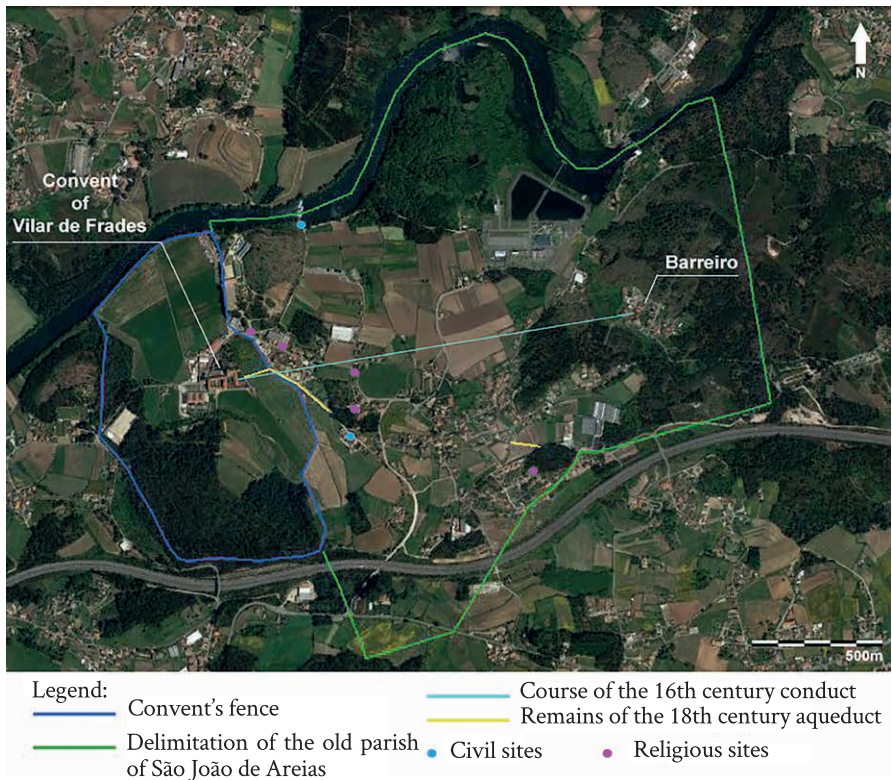



FIG. 8 Location of sites of collective significance in the old parish of São João de Areias related to the Convent of Vilar de Frades (António Pereira, 2016 – Cartographic base: Google Earth 7.1, 2016. Areias de Vilar. 3D buildings data layer. [Accessed May 2016]. Available on Internet: <URL: <https://www.google.com/intl/pt-PT/earth/versions/>>.

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Na última década, o tema da hidráulica, enquanto elemento integrante da arquitetura monumental (religiosa e civil), foi alvo de renovado interesse por parte de investigadores de distintas vertentes do conhecimento científico. Os estudos entretanto produzidos abrangem uma enorme heterogeneidade de temáticas, desde as de natureza técnica, até às de cariz artístico e iconográfico.

Esta realidade, que é transversal a diferentes países europeus, vem demonstrar como a hidráulica é um campo eminentemente pluridisciplinar, exigindo uma análise constituída por técnicos de Arquitetura, Engenharia, Arqueologia, Conservação e História da Arte, concorrendo para o conhecimento global dos sistemas hidráulicos na sua articulação com o património edificado e o seu entorno paisagístico.