Journal of Humanities and Social Sciences
Volume (6), Issue (12) : 30 Oct 2022
P: 185 - 209

ISSN: 2522-3380

مجلة العلوم الإنسانية والاجتماعية
المجلد (6)، العدد (12) : 30 أكتوبر 2022م
ص:185 - 209

Interpretation and Assessment of Islamic Antiquities within the hydraulic Heritage System at Al-Muwaqqar

Rawan Abdallah Al-Naser

Al-Muwaqqar Municipality || Jordan

Abstract: This research focusses on the Islamic antiquities and the related hydraulic system of the Al-Muwaqqar region. The problem of the study is to answer the following questions (1) Which antiquities survive today in Muwaqqar? How can they be described? (2) What kind of conclusions about their original appearance and their functions can be drawn from the existing remnants in combination with earlier reports? (3) What was the system of water collection and transportation? (4) Which is the interrelation between the water system and the dwellings and their environment?

The study follows different methodological approaches to the study of early Islamic architecture. The detailed investigation of the ruins, which the author conducted in Al-Muwaqqar in 2019 and 2020, is followed by their translation into written and drawn documents. On the basis of previous reports and a systematic survey of these surviving original remnants, the present research will give by applied quantitative as well qualitative methods an outline on the architectural structures with reconstruction proposals. It will discuss also how these monuments were related to each other functionally and how the Umayyad architects and engineers solved the problem of the limited water resources in this transitional area with low rainfalls. This creates an overall picture that gives the reader of the study and the future visitor of the place an idea about the place in its actual condition. The study will create awareness by interpretation, which is a precondition for raising the value of these monuments in the awareness of the local community and for visitors. The research recommended that the architectural monuments of Al-Muwaqar be placed within the cultural heritage at great risk of the Kingdom of Jordan.

Keywords: Al-Muwaqqar, Umayyad architecture, hydraulic system, Islamic antiquities.

تفسير وتقييم الآثار الإسلامية ضمن النظام التراثي المائي في الموقر

روان عبد الله الناصر

بلدية الموقر|| وزارة الإدارة المحلية || الأردن

المستخلص: يهدف هذا البحث إلى التعرف على الآثار الإسلامية والنظام الهيدروليكي المرتبط بمنطقة الموقر. تتمثل مشكلة الدراسة في الإجابة عن الأسئلة التالية: (1) ما هي الآثار الباقية اليوم في الموقر؟ كيف يمكن وصفها؟ (2) ما نوع الاستنتاجات المتعلقة بمظهرها الأصلي ووظائفها التي يمكن استخلاصها من البقايا الموجودة جنبًا إلى جنب مع التقارير السابقة؟ (3) ما هو نظام تجميع المياه ونقلها؟ (4) ما هي العلاقة المتبادلة بين نظام المياه والمساكن وبيئتها. اتبعت الدراسة منهجية مختلفة لدراسة العمارة الإسلامية المبكرة. وأعقب التحقيق التفصيلي للآثار التي أجراها المؤلف في الموقر عامي 2019 و2020، وترجمتها إلى وثائق مكتوبة ومرسومة. على أساس المسح المنهجي لهذه البقايا الأصلية الباقية، وضع البحث الحالي من خلال الأساليب الكمية والنوعية التطبيقية مخططاً تفصيلياً للهياكل المعمارية مع مقترحات إعادة الإعمار. وكيفية ارتباط هذه الآثار ببعضها البعض وظيفيًا وكيف حل المعماريون والمهندسون الأمويون مشكلة الموارد المائية المحدودة في هذه المنطقة الانتقالية مع انخفاض هطول الأمطار. يؤدي هذا إلى تكوين صورة شاملة تعطي لقارئ الدراسة والزائر المستقبلي للمكان فكرة عن المكان في حالته الفعلية.

في الوقت الحاضر، وأوصى البحث ان يتم وضع الآثار المعمارية للموقر ضمن التراث الثقافي المعرض للخطر الشديد للمملكة الأردنية، وهذه الحقيقة تتطلب تدخلاً عاجلاً. أيضًا، يصف البحث هذه التهديدات من خلال وصف وتقييم الدمار الحالي والمتدرج الطبيعي والدمار من صنع الإنسان. في الختام يقدم توصيات بشأن الخطوات الأولى للتدخلات من أجل الحفظ للأجيال القادمة.

الكلمات المفتاحية: الموقر، قصر، العمارة الأموية، النظام الهايدروليكي، الآثار الإسلامية.

1- Introduction

Umayyad Architectural Heritage is very rich and important in the Islamic history of Bilad ash Sham. Umayyad settlements of palaces were built in a certain pattern according to an important strategy. These settlements are scattered in a broad strip in the semi-dry and desert land from the south of Jordan to the banks of Euphrates River. Al Muwaqqar had a considerable socio-economic profile and was of high interest for Umayyad political supremacy power, it also occupies a strategic location for the caravan trade, (Najjar and others, 1989). The importance of establishing any settlement depended on the availability of water. The early Islamic palace in Muwaqqar was first recorded by E. Brünnow and A. von Domaszewski (Die Provincia Arabia, Vol. II, Strassburg 1905,: 182-189). They produced the first full description of the ruins of al-Muwaqqar. This early documentation is rather precious because it gives an exact state of these Umayyad and older monuments at the site of the year 1989. At that time, the preservation of these ruins was much better than it is today. After the visit by Brünnow and von Domaszewski al-Muwaqqar palace has suffered serious destruction caused by the re-settlement of the area. Compared with other palaces, al-Muwaqqar was already in the late 19th century one of the less preserved one. Water systems were the most important factors of early Islamic civilizations. Jordan is one of the lacking areas of natural water resources. There are seasonal waterways in valleys during rain. Al-Muwaqqar suffers from semi-desert climate, relatively high temperatures and low rainfalls. This indicates that the area needed water continuously and in sufficient quantities to be chosen as a settlement for the Umayyad state.

1-1 Research problem

The architectural components and structure of the Umayyad residence are still today widely unknown due to a lack of more detailed studies. It is the aim of this study to reveal the physical appearance of these monuments and to investigate their interrelation to each other. The resources that supplied the region with sufficient quantities of water are still obscure. The hydraulic heritage system was neglected in the post-Umayyad period. Most of it is destroyed today. The hydraulic heritage system was never studied and evaluated as a one unit with the existing antiquities. The exploration of these historic contexts as well as their presentation to decision-making authorities may not only add this little known area to scientific knowledge. It might further help to improve the life condition of the present population in reviving old water resources for their own benefit.

1-2 The Research Question

(1) Which antiquities survive today in Muwaqqar? How can they be described?

(2) What kind of conclusions about their original appearance and their functions can be drawn from the existing remnants in combination with earlier reports?

(3) What was the system of water collection and transportation?

(4) Which is the interrelation between the water system and the dwellings and their environment?

1-3 Methods

The proposed methods to achieve the research objectives is more or less qualitative research with interpretive historical methods. In order to have diverse opinions and views, historical findings need to be supplemented with qualitative parameters. Qualitative research methods will be used to gain a deeper understanding of the problem. It is appropriate for investigates the new field of the study and intends to ascertain and theorize prominent issues. Qualitative results and finding will be judged by whether they make sense or they are consistent with the historical collected data. It will also be judged if it is related to existing theories, published or unpublished historical data. This will provide a better understanding of a study. The research will follow multiple method approach through integrating historical analysis with a descriptive approach. These processes can be divided into three main steps summarized in the following:

1-3-1Theoretical approach: To provide background information, the planned study will go into historical depth of the area to understand the region and arrange the evidence for an interpretative framework. It will refer to the studies which discussed the area and its antiquities.The research will go to the archival documents, various publications and other published and non-published reports to compare the state of preservation for antiquities with the previous periods.in addition to collect data and evidence from there. Some similar cases related to the research problem will be discussed. It will be useful in reaching a general perception of the study problem. This will allow to identify and organize these data to evaluate the antiquities in the present situation in comparison with them.

1-3-2 Empirical / descriptive approach (Fieldwork studies), at this stage, Information have been obtained based on visual analysis and observation through the field visit. Collect qualitative data help to "study things in their natural settings, attempting to make sense of, or interpret phenomena in terms of the meanings people bring to them"(Groat - Wang, 2013, p. 218). The qualitative method has been used in the form of observations and understanding for the state of preservation for antiquities in its natural environment. This includes detailed investigation for the survival ruins and elements of these facilities compared with previous studies. In addition, interviews with people have been done who can provide a strong and authentic information about the history of the area.

1-3-3 Comparative analytical approach and extracting results, to analyze the data which were collected from the previous stages to develop a result. The results of the previous analysis have been set

into a dialectic context. The research integrated all sources of data and information. Related information and similar cases have been mentioned. Many data translated into written and drawn documents. Through analytical processes on the individual building elements. Hence, it can be possible to build a hypothetical reconstruction of the monuments depending on various evidences in an experimental way with graphic implementations. This research thus conducted reinterpretation and evaluation within the system of hydraulic heritage in Muwaqqar.

1-4 Importance of Study and expected Outcomes

The study addresses the area of Muwaqqar and its geo-physical setting in general. The main focus is directed on the Islamic antiquities and the hydraulic system in Particular. It will deal with the area as a material entity. This will preserve it within the whole cultural heritage. To reach the study goals, the research will examine the issues of the all-preserved antiquities in their actual state of preservation. It will compare them to older documentations to identify them in their relationship with each other and document them. It will result in a documented scientific study on the water system that was used to make the region suitable for settlement during the Umayyad period. This research aims to discuss re-trace the remnants of the early Islamic settlement and to compare their present situation with the first reports published by Brünnow and Domaszewski (II, 1905, 182-189). It will understand and assess the current state of these settlement. Basing on this assessment, the relationships of the antiquities to the hydraulic heritage systems will be documented in order to explain their role in connection with the Islamic power in this region. Moreover, the long-term goal of the research is to construct a comprehensive archaeological map of the main antiquities in the region. It will use the result to conduct a spatial analysis of these antiquities within the hydraulic heritage system and their environment.

1-5 Research outcomes

- An updated archaeological map which explains the antiquities and monuments in the area and the state of preservation of them,
- The water system of that period and the system for collecting and transporting water,
- Assessment for the hydraulic heritage system and its relation to the heritage monuments and their environment,
- To create awareness among people presently living at al-Muwaqqar about the importance of the region.

2- The Site and its Monuments

Al-Muwaqqar is today located along the highway joining the Jordanian capital Amman to Azraq. This region is traditionally from medieval times called “al-Belqa” To the east the settlements are getting

scarce. There are only the Qusur of Mushash and Kharaneh. The settlement of al-Muwaqqar nestles on a plateau rising 922 meters above sea level. In terms of climate, al-Muwaqqar lies in the transitional zone between the arable lands of al-Belqa and the Iraqi desert steppe with average rainfalls of 200 cubic meters per anno. Hence, the settlement area is a semi-desert land with uneven water distribution. There is a lack of springs and water resources must be supplemented by hydraulic installations. The site of al-Muwaqqar is overlooking semi-desert to the east and fertile al-Belqa' plain to the west. It controls the traffic crossroads to Al-Kharranah and Al-Mushash toward the east and to Al-Qastal and Al-Mushatta toward the south.

Al-Muwaqqar achieved decent attention by Arab poets and writers. The area was mentioned fourteen times in twelve poems by seven poets. It was in fact only one of several Umayyad settlements which were built in the lands east of river Jordan. At the site a variety of archaeological remains are preserved, most of them dating to the early Islamic periods. A palace was constructed with the purpose of political control. A large reservoir of square plan adjacent to this residential complex belongs to the same period. A few meters away from the palace there are remains of an unknown building. The building includes remnants of wall foundations and mosaic floors in addition to the remains of a destroyed pond. It is more likely that it is a bathhouse based on its analysis, which will be mentioned later. Al-Muwaqqar avails on many water installations such as ponds and wells in addition to canals and waterways.Even though protecting buffer zones are clearly marked by the Jordanian Authorities, these monuments fell into a miserable state of preservation. Additionally, a number of unregistered antique-ties such as various wells, channels and a large reservoir can be seen at the site. These antiquities were associated with a vast hydraulic system which in origin stems from antiquity (cf. Bartel 2013: 63).

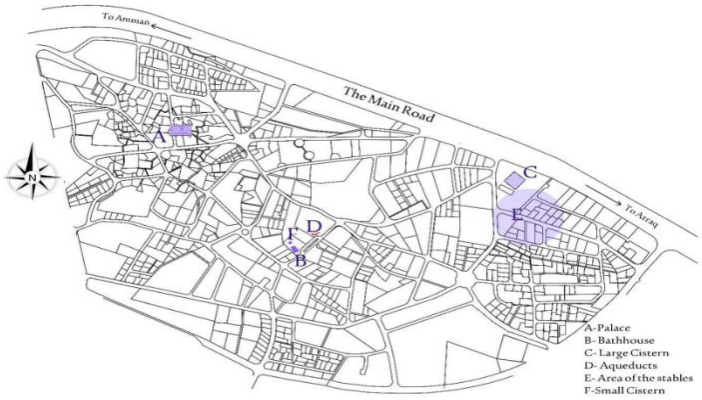

Figure (1) Al-Muwaqqar Plan of present land cataster with location of the Monuments (Municipality of Muwaqqar, Author, 2020)

2-1 The palace

According to the literature, a brief description of each monument will be presented starting from its oldest documentation by Ernst Brünnow and Alfred von Domaszewski and Alois Musil, in order to get a

preliminary imagination of the architectural monuments. This method of perusing early scholarly descriptions through the time in relation with the actual condition will facilitate a complete the intended visualization of the monuments. the capitals of Muwaqqar were first presented in the fundamental study by Hamilton (1948b) . They belonged to columns as well as to half-columns. Surprisingly, several of the capitals treated by Hamilton were still recently re-found in Muwaqqar and other places. They were previously considered lost in research. For this reason, the study presented here can provide new information on the architectural arrangement of the Umayyad Palace complex.

The palace is an outstanding example of an Umayyad desert establishment which reflects the architectural skills and arts of early Islamic engineers, architects, masons and sculptors (Talgram 2004: 34). Functionally, it relates to the administrative strategy and to the cultural supremacy of the Umayyad civilization. This desert residence was built in the 7th century A.D during the Umayyad Period. Similar to the Qasr al-Hallabat, the palace was built on the summit of a mount in Muwaqqar, which is 910 meters high, in order to form a landmark far visible for travelers arriving from the desert. Its position is in the line-of-sight with Qastal and Mushatta to the west and Kharraneh to the east. The ruins are located about 2 km north of the modern highway which assumingly follows more or less precisely the traditional caravan route.

2-1-1 Historical Description

description of the Palace according Brünnow –von Domaszewski and Musil. In their first detailed record Ernst Rudolf Brünnow and Alfred von Domaszewski (1904:182-189), basing on a site visit on April 16th 1896, described the general layout of the palace area as structure of a rectangular ground plan with 38m x 35 m dimensions. The long sites oriented in east-west and the short sides in north-south direction. In the center of the W wall Brünnow and von Domaszewski observed a projecting tower of rectangular plan. The thickness of the exterior enclosure walls was 1.12m constructed of massive limestone ashlars. The wall in the north and south are resting on the virgin soil while the interior terrace had been inserted between them. The remains of frame blocks of a reddish flint stone made them to suggest the presence of the main entrance at the N side. At this point, Brünnow and von Domaszewski observed a staircase at the interior side of the north wall which allowed to ascend to a second-floor level. Due to the sloping terrain, the eastern front of the palace raised on a substructure out of ten-barrel vaulted rooms of unequal widths which were fully opened to the West.

Concerning the barrel-vaulted subtraction along the eastern front, we owe him the information that the rooms ran longer than the enclosure walls described by Brünnow and Domaszewski, The upper eastern border of the surmounting terrace preserved the bases of triple half-columns of T-shaped section. Musil's elevation drawing shows a total of four of these This general rectangular plan layout is confirmed by Alois Musil who visited al-Muwaqqar independently only six weeks later than Brünnow and von

Domaszewski on June 4th, 1998 (Musil 1907: 190-195). He observed that the enclosure wall extends on both the southern and north sides further to the west merging into two corner towers ¾ circle plan. With this extension to the West, he determined the entire ground area of the palace with a total of 65 m (east.west direction) to 39 m (north-south direction). Musil confirmed the presence of the barrel-vaulted rooms along the western front. The interior space was divided by the wall in north-southern direction (which Brünnow and von Domaszewski considered as the western limitation) in two un-equal rectangular compartments. Musil speaks about two entrance doors in the northern and southern enclosure walls of the smaller compartment with a width of 1.5 m (Musil 1907: 191).

bases, which were obviously still in situ at the time of his visit. Their bays lie exactly in the vertical axis to the v-shaped imposts of the barrel vaults supported by pillars. It is quite conceivable that to the north one and to the south two more intercolumnia followed, which would suggest an open balustrade with a frontal pergola. The triple semi-columns corresponded probably to the full columns in the interior of the hall. Thus, the smaller part of the palace of al-Muwaqqar could have served as a kind of open representation hall for official receptions. On such occasions its eastern front offered a panoramic view of the steppe desert and the caravan roads arriving from there through the open pergola.Analogous artificial terracing on an alignment of barrel-vaulted units is well known from the Decapolis cities of Gadara/Umm Qais and Capitolias/Bait Ras. In Umm Qais, the barrel-vaults support the western terrace border of the western basilica terrace with galleries and the vaulted rooms served as shops (tabernae) in the adjacent subordinated cardo minor (WeberKaryotakis 2002, fig. 67,73) In contrast to al-Muwaqqar, these shops were closed by facades out of smooth basalt masonry with elaborate doors. This arrangement has been dated by the excavators to the Byzantine period, when this terrace has been converted in to a martyr's church complex with atrium.

At Capitolias / Bait Ras a similar arrangement of barrel-vaulted rooms can be found along the main street, immediately adjacent to the Ayyubid-Mamluk mosque. This area had been cleared and partly excavated in the later 1980s. The excavators proposed a date of this structure to the early Islamic period. In this regard, the barrel vaulted arrangement in the eastern terrace of the al-Muwaqqar palace had Byzantine and Roman prototypes in the wider environment which certainly inspired the architects and engineers who were put in charge with the construction.

According to Brünnow and von Domaszweski the levelled floor surface of the terrace was, at least in parts, paved with limestone slabs. Portions of this pavement have been excavated in 1989 and are still preserved today. They are rather carefully cut and smoothed at their surfaces. Their arrangement is rather precise. Brünnow and von Domaszewski assumed that the interior arrangement of the building was apparently organized in the plan of a hypostyle basilica. The author of this research did not observe traces of column bases on the remains of the pavement during her survey. Most probably such traces can be observed after a proper cleaning of this area in future.

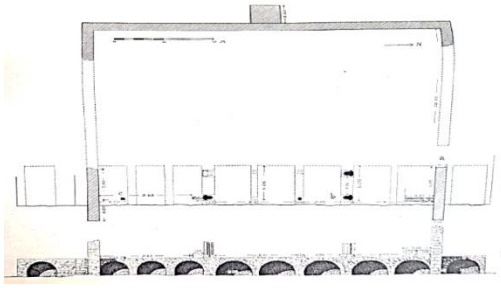

Figure (2) Ground plan with elevation of the eastern front of al-Muwaqqar palace according to Brünnow-von Domaszewski (1904, 183 fig. 757)

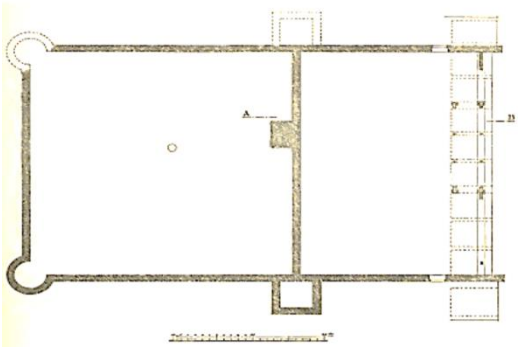

Figure (3) Ground plan of the al-Muwaqqar palace according to A. Musil (1907, 192 fig. 74)

The Jordanian Excavations from 1989 to 1992

In the years between 1989 and 1992, archaeological excavations were conducted by the Department of Antiquities in al-Muwaqqar. These investigations were directed by Dr. Mohammad al-Najjar (Azar – Najjar – Qussus 1989) and Dr. Mohammed al-Waheeb (1992). Their results, published in 1989 and 1993 in preliminary reports, clarified the description of the early travelers by providing unambiguous evidence of some important structural architectural elements. The work of the Jordanian archaeologists focused on the palace. Najjar and Waheeb divided the palace terrain as documented by Alois Musil into the two schematic areas I-II. The excavations were limited to probe trenches, which revealed not only architectural remains and finds of the Umayyad period, but also a considerable number of Abbasid pottery. This proves that there was a significant continuity of settlement in al-Muwaqqar after the fall of the Umayyad dynasty. Apparently, this continuation is further attested by the Arabic inscription citing the famous throne sura "Ayat al-Kursi" from the Holy Quran. Unfortunately, this important document was never unpublished in detail and is lost today. According to M. Waheeb, it gives the date in 137 Hijri (754 AD) which marks the assumption on rule by Abu Ja'far Abdallah ibn Muhammad al-Mansur (715-758 AD), the founder of the Abbassid Dynasty, who held the caliphate in the Medina as-Salam of

Baghdad, which he founded in 762, until his death on 6th Dhu al-Hijja 158 AH/775 AD. Not all the excavated remains of the wall-sectors allow conclusions about the original architectural design of the palace. Of particular importance, however, were the features in the squares (Azar – Najjar-Qussus 1989-area I /A2-B-2-C-2, 1993-I/D4, and 1993-II / A 11-12). All of them confirmed and complemented A. Musil's observation of the almost square larger western structure with round towers at the corners.

The sounding in square (Azar – Najjar-Qussus 1989-I /A2-B-2-C-2) revealed a north-south running wall constructed of carefully cut massive limestone blocks. In two sectors this wall is disturbed by a later installation of unhewn smaller stones. From its position in the 5 x 5 m quadrilateral excavation grid, it can be concluded that this wall was part of the interior construction of the square complex. It is significant that the older wall corresponds to a ground horizon that was covered with flag stones. M Najjar dated this wall according to the pottery to the first Umayyad construction phase of the complex. The examination trench (Waheeb 1993-I/D4) performed by M. Waheeb in 1993 led to the clarification of the two adjacent complexes described by Musil. The trench was dug exactly at the assumed junction between the two complexes along the northern perimeter wall. Here the north-south partition wall came to light, which in itself merges orthogonally into the westeast enclosure wall. On the outside of this T-shaped wall junction (i.e., adjacent to the north), the stone foundations of a tower, ¾-circular in plan, were revealed. With a diameter of 4 meters, this structure corresponds well to the south-western corner tower of the square complex as documented by A. Musil.

Second important evidence was gained by the remains of buildings on the left and right (i.e., west and east) of the partition wall. To the east of it, the carefully laid limestone pavement became visible, which was already mentioned above. It may be concluded from this that this paving extended across the floor of the smaller rectangular complex over its full width onto the partition wall. On the other, i.e. from the western side of the partition wall, there run walls at right angles east to west, which also surround the same Umayyad flint floor. As in the case of the western side of the probe square (Waheeb 1993- I/ D 4), these must be remnants of the internal buildings of the larger square complex. It is an alignment of rectangular rooms connected to the perimeter wall, whose doors presumably opened to a central open courtyard to the west. This assumption is supported by a circular cistern opening in the center of the square complex, which can still be seen in the field today. Another important evidence was uncovered in the (Waheeb 1993-II / A 11-12) sondage. The excavator Mohammed Waheeb prudently chose the place for the trench in the assumed middle of the western enclosure wall of the larger square complex. In fact, this wall was found in a northsouth direction. Its thickness of 1.20m corresponds well to Musil's specifications. On its western external side, the semicircular foundation of a tower with a diameter of nearly 4 m (Waheeb 1993/Area I, Sq. D 4) is adjacent to the wall. This corresponds in its shape and dimensions to the round towers at the corners of the building mentioned by Musil and proved in the sondage (Waheeb 1993/D4) The outer appearance of Qasr alMuwaqqar therefore corresponded exactly

to that of Qasr Kharaneh in the desert further east : A square, probably two-storey building with a square ground plan, whose perimeter walls were reinforced outwards by four massive round towers at the corners and additional, likewise massive, semi-cylindrical towers halfway along. However, this is the rule for preliminary publications. Fortunately, Waheeb published an overall plan of the architectural find contexts, which, after the completion of the excavations, brings together all features, including those not described by him in detail.

However, this general plan is very difficult to interpret. For this reason, the author prepared a simplified, schematized general plan (figure.4) based on the documentation of Brünnowvon Domaszewski and Musil, in which the excavation features of 1987 and 1993 were mapped. The walls revealed by the excavations are distinguished from the older sketches of the travelers by a light grey color. In addition, the schematic sketch also shows those remains of buildings that are missing from Waheeb's overall plan but are clearly visible today. Thus, on the terrace, a row of foundations slightly above the level of the pavement stretches in a straight line from north to south, on which the Attic-Ionic bases of the columns stand in the site. This is the southern section of the stylobate of the western colonnade of the basilica nave of the Basilica.

2-1-2 Proposal Reconstruction

Visitors to the palace area of al-Muwaqqar find it difficult to get an impression of the original appearance of the complex. However, together with the documents of Brünnow - von Domaszewski and Musil with the results of the excavations presented above, some statements in this regard are yet possible. Below, the hypothetical plan of the palace showing the traces described by Brünnow-von Damaszeski and Musil (black) as well as the walls excavated in 1989 and 2002 (grey), (Figure.4). Added are also all elements which can clearly be observed today in the field. The bases of the T-shaped pilasters and the columns (hatched in blue) are shown in a hypothetical reconstruction. The palace at al-Muwaqqar was two-part complex, extending in a large rectangle (67*39 m according to A. Musil; cf. Barsanti 2007, 437) from east to west. The two distinguishable main parts of the palace are:

A. building of square ground plan in close analogy to Qasr Kharaneh with four massive round corner towers and each a semi-cylindrical tower along the perimeter walls. The question where the entrance to this building was located cannot be answered without further excavations. The building had internal structure of adjoining rectangular rooms aligned along the perimeter walled, opened to a central courtyard. This suggests the existence of a cistern in the center of the open square, the opening of which can still be seen. It is not known whether the interior of the building had two floors as the Qasr Kharaneh.
B. Along the eastern perimeter wall, a second smaller building complex extends over the full width of the eastern perimeter wall of Qasr and is directly adjacent to it. This building has a rectangular

ground plan of about 39 x 18 m. Due to the sloping terrain, the area of this building was extended to the east by a series of barrel-vaulted rooms as a partially artificial terrace. The interior was divided by two colonnades as a basilica. Between the stylobates the remains of a carefully laid limestone pavement have been preserved. The colonnades each consisted of seven columns with Attic-Ionic capital bases: Among the capitals published by R.W. Hamilton, at least 13 can be considered as round and therefore assigned to full columns. Three of the bases still sit on the stylobate in situ inside the hall. According to the dimensions of the individual parts obtained, the total height of a column can be determined to ± 2.80 m: Base: ± 0.54 m + shaft ±1.74m + capital. ± 0. 52 m = ± 2.80 m. If the room is thought to be covered with barrel vaults that bear on arcade arches with transoms on the columns, a clear room height of up to 5 m should be expected, with a flat ceiling on horizontal architraves correspondingly less (ca. 3.5-4.00 m). It can be assumed that the height of the half-columns and the tripartite T-shaped pilasters corresponded to the heights of the full columns. However, since not all of the workpieces have been preserved in examples, this cannot be proven. Of the pilasters, the elevation sketches by Brünnow-von Domaszewski and A. Musil show two (four in Musil) preserved their lower parts on relatively high stepped bricked-up bases. The pier shafts were not monolithic but, like their bases, consisted of superimposed individual parts substructures of the basement (Figure 5) in latitudinal axial correspondence with the full columns in the hall. The Hypothetical elevation of the eastern front of the hall shows an open balustrade and triple barrel-vault ceiling in the upper storey (red), in the background elevation of the Qasr according Musil 1907, fig. 74.

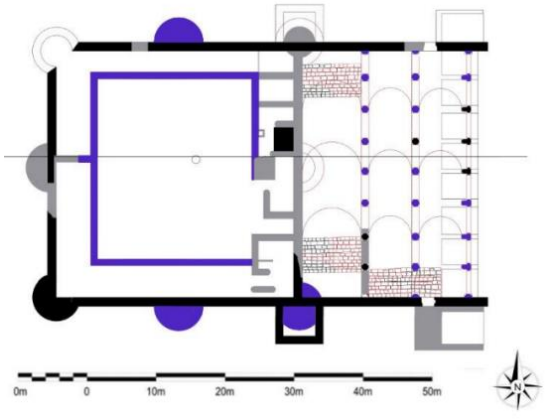

Figure (4) Sketch plan of the palace of al-Muwaqqar showing the hypothetical reconstruction with red color. (Drawing by the author under supervision of Th.M. Weber-Karyotakis, 2020)

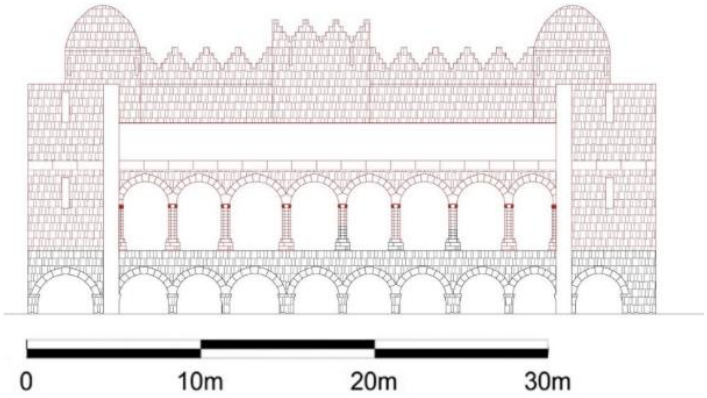

Figure (5) Hypothetical elevation from the east (drawing by the author, 2020).

Basilica hypostyle plans occur quite frequently in Umayyad architecture as an adaptation of Byzantine three-aisled churches which are abundantly attested in Jordan (Kakish 2007). Predominantly, such tripartite colonnaded halls were used for mosques, only rarely for audience rooms such as in Mschatta and Qusayr 'Amra. The direction of the colonnaded halls was transformed by early Muslim architects for mosques according to the liturgical needs of Islam by orienting the act of worship by praying toward Mekka (qibla). Many examples have been assembled in IHSJ (2020: pp. XXVII-XIX), and in most cases in Bilad al-Sham the praying orientation is directed to the south and / or southeast. If the colonnades are longitudinally running in north-south direction, the prayer room is frequently extended by additional naves to the east and west to form a board rectangular ground plan. Examples are: The Umayyad mosques, for instance, at 'Amman downtown or (IHSJ p. 42 no. 30 fig. 30.1) or Hubras (IHSJ p. 152 no. 138 fig. 138.4). The question of the roofing of such a colonnaded hall con presently only hypothetically be answered, since no specific stone material has been identified in the field to indicate a convincing solution:

A. is a roof consisting of three parallel barrel vaults covering the three naves lengthwise in northern-southern extension. The columns could carry these barrel vaults by inserted arcades resting on imposts. Halls covered in this way are known in Umayyad architecture such as the mosque at al-Hallabat (IHSJ p. 143 no. 120 fig. 120.3) or the audience hall at Qusayr 'Amra.
B. Uses the classical entablature of columns carrying horizontal architraves on the abaci of the capitals. This construction suitable either to carry a flat roof resting on transversal wooden beams with cane mats and earth package, or a wooden truss for gabled roofs as it has been assumed by A. Walmsley as a roofing for the Umayyad Mosque at Jerash (IHSJ p. 198 no. 178 figs. 178.2 and 6).
C. Seems to be less probable for chronological reasons: The abaci of the capitals carry constructed arches set in the square which carry inserted cross vaults. This type of roofing occurs frequently in later Islamic periods in northwestern Jordan. The two main examples are Ayubid-Mamluk the Friday mosques at 'Ajlun, dated by inscription to H 645 / 1247 AD (IHSJ pp. 29-32 no. 21 fig. 21.12) or, in size reduced to two naves, the Masjid at Remun (IHSJ pp. 350-357 no. 302 figs. 302.3-4).

All presented considerations based on still existing architectural elements lead us to the restitution of the scarce ruins to a two-part complex: **1)** a traditional Qasr with fortified round towers and interior buildings according to the common scheme of the Umayyad Qusur, and **2)** a representative hall adjacent to it in the east. An isometric reconstruction, admittedly hypothetical to a large extent, may be a starting point for further research in the future, but in any case, it must include extensive excavations. All our considerations made so far have remained an intellectual castle in the air, if they could not be substantiated in their probability by a striking parallel. A comparable spatial organization of a Qasr with a separate representative building in the immediate vicinity finds its best and most exact parallel in the Umayyad palace at Shuqairah al-Gharbiyah (Shdaifat 2006, 205-216; Shdaifat - Ben Badhann 2008, 184-189) In close analogy with the al-Muwaqqar palace, the Shuqaira complex consists of two parts: A larger, almost square palace area of the al-Bait-Type. Secondly, a rectangular hall of the basilica plan. The hypostyle hall must have been bordered to the south by a strong retaining wall or even a substructure similar to that at al Muwaqqar. The stylistic features of the capitals of the hall preserved in Shuqaira also show close chronological and even craftsmanship similarities to those of the hall in al Muwaqqar.

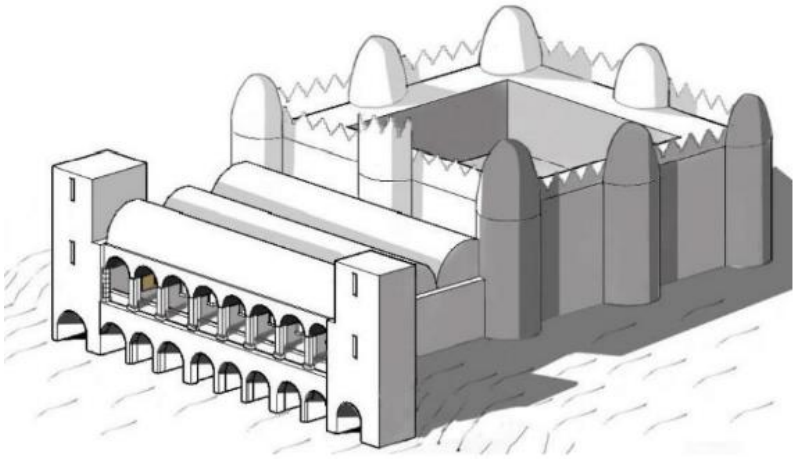

Figure (6) Hypothetical 3-D reconstruction of the Qasr of al-Muqwaqqar with the hall in the east (mosque or audience hall) (infographic drawing by the author, 2020).

A drawing of al-Muwaqqar by an unknown artist (IHSJ 316 fig. 269, 2), published in a book of 1890, six years before Brünnow and Domaszewski arrived to the site, represents the palace in a fairly undemolished condition.The landscape looks fancy, but the qasr with the terrace corresponds well to the hypothetical reconstruction proposed in this research (Figure 6). A major point of information given by this document is the confirmation of the towered palace with the artificial terrace which corresponds well to our reconstruction. The only point to be discussed by future studies is the open balustrade of the upper storey which here appears closed as the barrel-vaulted rooms of the substructure.

2-2 The Bathhouse with the secondary cistern

In the royal domains of the Umayyad, whose centers were occupied by palaces with mosques as an expression of the Islamic power and culture, there were also luxurious bathhouses. These baths were never integrated into the palaces themselves, but were located in their wider surroundings. Also, al-Muwaqqar had such an isolated bath house. The early travelers do not give any information about its ruins. This is explained by the fact that it was still underground at the time of their visitors. The area in question lies 300 m southeast of the palace hill on a flat modern undeveloped field (Figure 1 No. B). The ruins are only partially visible on the surface today.They are surrounded by a number of now open water channels and cesspools for the purification of flowing water. There is a smaller cistern (Figure 1 No. F), which lies about a few meters northwestern of the bath.The reservoir is completely destroyed. No features can be seen except a part of the reservoir wall. Remnants of a stone channel linking the reservoir to the Bath are evidentIt is clear fr. om the archaeological remains in the site that there is a secondary pond near the main reservoir. The pond may act as a water filter before entering the main reservoir. The planning axis of the three partly visible rooms (Figure 7) lies in a north-western direction and thus makes spatial reference to the palace hill. This suggests that the bath was accessible from the northwest. In fact, the north-western room C, which lies in an axial alignment, is the largest and could have been the reception hall, which was laid out with a pavement of square light brown limestone slabs (indicated on the plan in brown color).

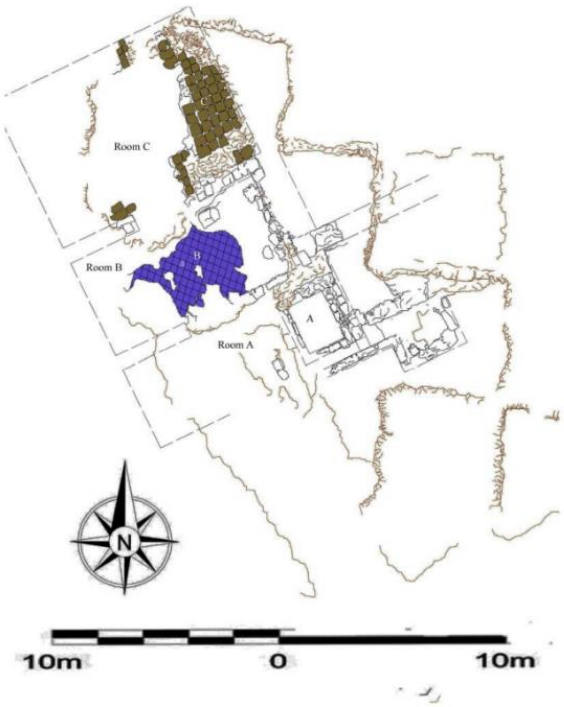

Figure (7) Plan of the remains of the Bathhouse presently visible on the surface with limestone pavement (brown) and colored mosaic floors (blue) and small water basin A (Author, 2019).

These larger halls were used by the arriving bathers to take off their clothes and after bathing to take a rest in relaxing leisure and finally to dress again. Room C, adjoining to the south over its full width, is somewhat smaller and completely covered with a colored mosaic floor that limited to geometric patterns on a white background. The mosaic floor composed of several rectangular panels, which in turn are framed by thin ornamental strips. The mosaicists used black, dark blue and red medium- size stone tesserae to create scale patterns, rhombuses with small central squares and interlaced circles. The floor is dominated by the panel with the rhombic pattern. In terms of its function, this luxuriously furnished room B forms the transition from reception hall C to the first bathroom A. An interpretation as a bath is finally suggested by room A, which is then adjoining to the south. Its floor is covered with earth and also its course to the south disappears under the surface which is not exposed. Immediately after the passage to Room B, a rectangular structure using fired bricks is inserted in the northwest corner of the room, Room A. On the floor and along the interior walls there are still large chunks of waterproof plaster (terra pozzulanea), which undoubtedly justify its identification as a water basin. In the context of the entire complex, this is therefore the first bathing area where, in accordance with customary practice, one washed oneself first with cold water. This is therefore the cold bathing room that was called frigidarium in Roman bathing. However, the style of the floor mosaics testifies to the use of the bathing facility in the early 8th century. Similar mosaic floors have been found in other Umayyad buildings such as the Qasr al-Hallabat.

Similar cases with an axial or linear disposition following the classical Roman model could be seen in many baths such as the cases of Qasr Ain es-Sil and Qasr Mshash. the baths of Ain es-Sil and Mshash are almost in similarity with the bath-house in Muwaqqar in their plan. Hence, this indicates the possible similarity in the functional distribution. The plan of these baths consists of two main sections: The Audience Hall and The Bath Complex.

2-3 The Royal Stables

Both R. E. Brünnow – von Domaszewski (II. 105, pp.186-187 figs. 767-771) and A. Musil (1902, pp. 26-27 figs. 27-30; 1097, pp. 194 figs. 79-82) report about a three aisled building covered with three-barrel vaults. Brünnow and von Domaszewski locate it in south-southeastern direction in a distance of 8 minutes (=288 m)2 while A. Musil says that it was at “some distance to the southeast "of the large cistern. The exact location cannot be determined anymore Because the building seems to be entirely destroyed and overbuilt during the last decades by modern houses. At the times of the visit of the scholars in 1896, the central barrel vault was still preserved .

The ground plan was rectangular in outline and divided by two latitudinal separation walls supporting the barrel vaults into three parallel aisles, approximately equal in their widths. The total dimensions are given as: 13.36 m preserved length of southern Wall and 13.86 for the “best preserved western wall” by Brünnow – von Domaszewski (II. 1905, 186, which does not coincide with the given

detail measurements on fig. 767). A. Musil (1902; 1907) gives for the lengths of the walls 13.5 – 17 m (north-south) x 16.6 m (east-west) and a width of 4.42 m for each aisle. Some entrances to the building could not be detected at that time but Brünnow – von Domaszewski show door in the hatched northwestern short wall. According to the location given by A. Musil, this hypothetical door was oriented toward the large cistern – and thus communicated with it functionally. However, the decisive feature of this building, which is rectangular in plan, is the regular rows of carefully constructed arches in close intervals that break through the inner partition walls of the elongated rooms. As it is apparent from A. Musils close-up photograph (Figure 3.687c), the lower sectors of these arches were covered by the rubble which had accumulated at that time inside the rooms. Hence, the early visitors were completely in the limbo with an interpretation and the function of the structure.

In respect of the interpretation and consequently the function of this building the author would like to bring two proposals into the discussion. transport and riding animals had a high financial and social value in the times before. Especially horses from warm-blooded, noble Arabian breeding were luxury animals that required careful maintenance (Shahîd 1995, 230-237; Quadry 2012, 11-15). While camels can stay unharmed under the sun for long periods of time, horses need sufficient drinking water and cool stables as shelters for the break from riding. In the case of the three-partite building in al-Muwaqqar, the mere proximity of the large cistern as a watering place for animals might indicate such a function. If Brünnow and von Domaszewski were right in their assumption of a door in the north-west wall, the access would have been directly oriented towards the potential horse drink.

The second argument are exact architectural parallels that the author is ware of one other place in the fertile Ajlun Mountains of Jordan: In the old village center of Zu'biyah west of Irbid, old farmhouses of Fellahin have survived, which preserve exactly this type of building with barrel vaults as animal stables . These stables consist of long rectangular parallel rooms divided by partition walls. As in al-Muwaqqar, these rooms are covered lengthwise by barrel vaults. In the partitions there are singular passage doors which allow circulation from one room unit to the next. The surfaces of these walls are also interrupted in close succession by arched openings in which rectangular feeding mangers are inserted.

2-4 The large Water Cistern

The water management was an important precondition for a successful land-use in the area of al-Muwaqqar, in the time of the Umayyad Caliphs as well as today. The hydraulic installations inaugurated already by the Nabataeans are the significant heritage monuments at al-Muwaqqar. The channel system is widely hidden under the soil. Several ponds and cisterns, however, are not only visible on the surface but still used by the people at al-Muwaqqar today.

The most important water installation at this place is certainly the square-shaped open cistern, which is situated at a distance of about 600 m south-south- east of the palace hill, directly adjacent to the

modern asphalt road leading to the Amman-Azraq highway. While R. E. Brünnow and A. von Domazewski (II, 1905, 18-187 with fig. 770) mention it only in a single sentence but depict it in a view from the southwest on fig. 770, the traveler Gray Hill (1896, 30-31) gives a more detailed description: „South-east from the citadel 800 paces is a large open reservoirfor water, the cement adhering in many places to the stone walls, but the whole is in rouinous state. It is 33 paces in square and about 20 feet deep... ". Most open water tanks are located in the periphery or at the borders of the settlements and serve for field irrigation or cattle feeding. From the large cistern of al-Muwaqqar comes the Arabic inscription, which was first published by R.W. Hamilton (1946) together with five shaft fragments of the originally 6.71 high column, on which the level units were marked by inscriptions. One of these fragments gives the date of 104 H / AD 722/23 (Hamilton 1946, p. 75 postscriptum note 2). The height of the column of 6.71 m onto the lower collar of the capital indicates the highest possible water level, so that together with the surface area of 34 x 31.5 m given by A. Musil, the maximum capacity of the cistern can be projected to approx. 7.200 m3.

Nowadays, it's clearly visible that the cistern contains two smaller ponds that connected to the main reservoir through stone canals. These ponds purify water from clay deposits and dirt before entering the main reservoir. Anyone can go down to the bottom of the reservoir by two staircases attached to the reservoir wall. These staircases located in the two north-west corners of the reservoir. Several water canals are connected to the reservoir from the two sides. The reservoir is surrounded by about 3 m wide Pavement. It is also partially surrounded by a deteriorating fence. The site contains a small induction gate built of stone showing the year of rehabilitation work of the reservoir by USA in 1952. In the center of the reservoir wall there is a water gauge contains Latin numbers. This measure was used to determine the water level in the reservoir.

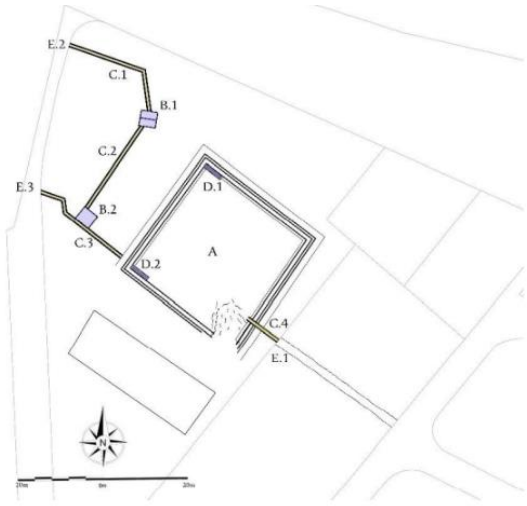

Figure (8): The plan of the main Cistern (Author, 2019)

A- Large Cistern; B-Secondary ponds C- Stone channels; D-Staircases; E- tributaries of a valley

The size of the pond B.1 is about 5.35 * 6.43 meters with 2.40 meters depth. The pond is connected to the tributary of the valley from the northwest by a stone channel. In the middle of the pond, there is a filter wall divide the pond from the half. There is another one at the entrance to the northern canal that supplies it with water from the tributary of the valley. This pond is not directly connected to the reservoir. The water firstly passes through the pond B.2 and then to the main reservoir. On other hand, pond B.2 is about 9 * 9.3 meters with 1.50 meters depth. The pond has a filter wall at its mouth from the northern channel. It also consists of another filter wall from the south with 0.42 meters thickness. This pond is connected with three stone channels. One of them are supplied it with water from the valley. The other one supplied it from the other pond. The last channel connects it to the main reservoir to pour water into it, Figure (8).

2-5 Wells and other Channels

According to (Waheeb, 1993), several wells were used in Muwaqqar. These wells were often built on the runoff line and in the catchment areas. Many of old ones have been demolished or owned by residents. Some of them were used for store water. Others were used as sewage place. Many of these wells which Waheeb mentioned have no traces. In the north-eastern to the path, there are traces of destroyed stone water channels. the thickness of the canal wall is about 50cm. The depth of it is about 0.90m. Only a small part of that channel appears. It has been partly buried and destroyed by modern facilities such as a street to the east and a modern house to the west. These installations seem to be related to the smaller cistern, (figure 9.f). It seems also to have performed a kind of distribution function between the bath with its small cistern and the large cistern.

3- Comprehensive Map

The research can reach a basic concept of a comprehensive map of existing antiquities within the water system. Depending on a topographic analysis of the area, the movement and direction of the natural water runoff have been identified in addition to the highest and lowest points in the rejoin. This also contributes to the determination of water collection points. The locations of monuments and ponds have been interpretation in relation to the movement of water and the places of its collection. This provided a basic idea of the reasons for choosing the location of each monument and making assumptions of the water sources that feed it .Al- Muwaqqar region consists of a group of plateaus, plains and valleys. It contains a number of major plateaus. These plateaus are about 919 meters above sea level. Al-Muwaqqar palace is located on one of them.

On the map in figure (9), all main water systems and Islamic facilities have been set on one map. Based on this map, we could reach a comprehensive concept of the hydraulic system within the heritage facilities of the Islamic era. The two reservoirs were built at the intersection of the surface runoff lines. This

means that both of them were built in water catchment areas. As for Al-Muwaqqar Palace, it is not located on a water gathering point because it is built on top of a hill. This is due to the Umayyad policy of palaces with a purpose of political control. They were built in a way that monitors the surrounding such as convoys and roads. A runoff line runs close to the palace. According to (Musil, 1901), he mentioned a presence of a water tanks south of the palace. There are no traces of these tanks. The runoff line may have been used to supply these tanks and the inside well of the palace as a close source of water for the palace.

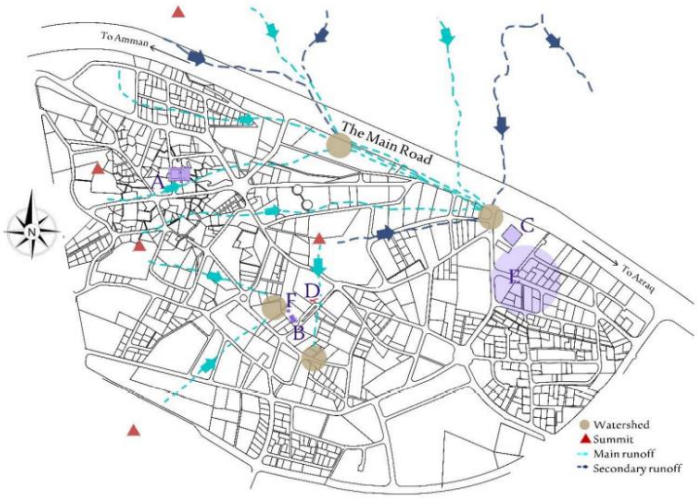

Figure (9) Comprehensive water system map within the Islamic monuments (Municipality of Muwaqqar, author, 2020)

A: the palace, B: bathhouse, C: large cistern, D: aqueducts, E: area of stables, F: small cistern

4- The monuments in their present condition

The remains currently preserved in Al-Muwaqqar were already very sparse when the early travelers visited the site and these have been further reduced over the last decades due to the modern resettlement of the place.With the augmented and permanent presence of humans, the hands of vandalism brutally grasped Al-Muwaqqar. The major challenge facing archaeological sites at present is urbanization. Their complete physical reconstruction will probably never be possible again.

The neglect of the cultural heritage due to unawareness leads in Muwaqqar to ongoing damage. The archaeological features there suffer from gradual decay as the main causes of destruction. Main reasons for the decline in the state of preservation of those remains are natural and human factors. The natural causes of degradation are mainly the weathering factors which causes a constantly destroyed. The human causes of degradation are represented by neglect, unawareness and ignorance of cultural value. The population deals with the remaining settlements negatively because they do not estimate them as a part of their own identity.

4-1 Brief Assessment for each monument

A. **The palace:** The palace did not receive any attention or interest, although some of its features were clearly defined. This has caused the loss almost total of the original setting and building masonry. Irregular Stones were used to fill the lacunae. There are also traces of fire burning inside the remains. Large parts of the palace were damaged, due to the encroaching of the new houses on this site. Many parts of the palace are used as livestock pens by local residents. It also became a landfill. Some parts of the palace are mostly original and have not been restored. The restoration was randomized by laying stones on top of each other without study. Many parts of the roof were destroyed and exposed. The roof is structurally unstable. It could collapse at any moment.

B. The Bathhouse: The building is completely damaged. Nothing appears from its features except parts of the mosaic, stone pavement and some foundations of the walls. These floors suffer from the manifestations of damage and destruction resulting from environmental factors surrounding them. They also suffer from tampering and deliberate sabotage. The deterioration of the structure is represented by fractures and cracks in these floors. The main reason for the deterioration of the site is due to leave it exposed to the atmosphere without any protection work. The site began gradually lose its features and material properties due to its neglect by residents and government. The most important manifestation of the destruction is the loss of mosaics pieces.

C. Hydraulic Installations: water structures have been destroyed or buried while others may have been built over them. The only device that survives so far is the big reservoir. The reservoir with its channels and secondary filtering stations is almost in a good state of preservation. The retaining walls of the reservoir are also almost in a good condition. The state of condition of the channels is mostly good with some fractures in the stone masonry. In some parts it appears the use of new stone different from the original building stone. There is some cracking in the staircases leading to the bottom of the reservoir. The northeastern corner of the reservoir is damaged and incomplete on the surface. The pond turned into a swamp for contaminated water, a landfill and a source of pollution. The bottom of the reservoir and channels is filled with dirt, waste and mud most of the year. The reservoir needs many cleaning works. It becomes a source of danger due to the lack of a good fence surrounding it.

5- Summary and recommendations

Al-Muwaqqar has a socio-cultural significance through the existence of a heritage fabric reflecting the history of Umayyad settlement. Successful water system used in semi-dry land of Muwaqqqar contributed to the establishment of the civilizations there in Islamic times. The research has endeavored to identify, document and interpret the remains of the Islamic antiquities which are survived today and have heritage significance, especially the damaged of these ruined settlement in comparison with the old documented for them. Furthermore, the way each land of the settlements is connected to the water.

Hence, it gave an overview of water sources and devices were identified in the area. Not all have been identified. This is due to the lack of evidence and literature dealing with this aspect. In addition, the establishment of the town above many of those surviving devices. This caused a disappearance and destruction of many water devices associated with the settlements. Drawings and photographs taken by travelers and scholars were an important contribution to the research. Historical documents, excavation, works' reports, published materials and unpublished archive were examined. They represented important evidence of the monuments. The research analyzed their damage with main reasons caused this damage. Many Original parts of these settlements were lost. The details of ancient water structures are notoriously difficult to define as whole.

6- Recommendations for future Conservation

It can be clearly noted that the site suffers from a number of issues that threaten its safety and survival. After determine the main causes of the damage before, Diagnosis should be continued. It must be based on direct observation of the damage and material decay in addition to making material and structural tests. Producing a detailed glossary of damage could help to have a full understanding of the structural and material characteristics on its actual state. Hence, it will help in determining the appropriate treatment processes for each damage type and the techniques used in the future construction. The monuments in Muwaqqar needed more excavation work. So when the knowledge is not yet complete during the work, structures have to be stabilized. Budget reduction is one of the most important procedure in the first stage of the maintenance work. So, the implementation of the Risk Management process at the beginning is strongly advised. It will be effectiveness to prevent more damage to the site. A set of recommendations will now be put forward with a brief for stating their mechanism and reasons as a first step for the heritage conservation work in Al Muwaqqar;

6-1 Landownership and legal Applications: In fact, Muwaqqar is affected by its surrounding environment that contribute in a negative way. It is still considered as one of the most dangerous risks affected Muwaqqar. The ownership by the local of lands containing Islamic remains will allow them to build their houses randomly. The heritage lands must allocate them to the Department of Antiquities property. Hence, they could relocate infrastructure to more resilient areas which will not be practiced at archaeological site by local. Perhaps this will help to reduce the negative infrastructural changes affecting the site such as construction of the roads in these historical sites. In addition, to prevent the urban sprawl on these lands. Other procedure could be done is making an addition of physical barriers to inhibit vandalism and illicit excavation that took place in many historical sites.

6-2 Site Clearance, Excavations and Anastylosis: The first step to preserve these remains is the cleaning work. Clearance of archaeological structures must occur on a regular basis based on an annual action plan. The site should be cleaned starting from the waste, stones debris and plants. This could be

done by Mechanical (manual) methods. Trash dump could be made for no more trash near by the property. As well as making guidelines by the Municipality to move the trash garbage away from the properties and imposing tax for those who drop trash inside or near them**.** Another thing could be done is to start excavation and research work aimed to collecting any elements belonging to these settlements. There are many artifacts and stones belonging to archaeological sites, whether in the sites themselves or in the vicinity of the region. Many residents were taking many pieces from the monuments as decorative elements of their homes. After that, these elements which were collected from excavation works or found with the local must be examined. This is by studying which of them are identical to each other, in addition to the origin to which each piece belongs.Stone parts and remains related to these heritage sites should be collected and re-organized**.**

6-3 Preliminary Shelters and Reburial for endangered Objects: The Islamic sites in Muwaqqar lack of supervision and follow-up by the population and the competent authorities. There is a need to ensure the preservation of the remains of heritage surfaces and elements. The Archaeological remains should never be exposed to the negative impact of weathering. This aims to mitigate damage to archaeological monuments from environmental factors. Hence, shelters and reburial are often considered as protective procedure. It will somehow comprise measures to mitigate factors causes of deterioration. This based on a baseline data that provides the necessary information on the existing condition of the remains to establish the main features to be preserved. This should be studied within the state of social, and physical surrounding the site. As for shelters, it must be dealt with it as a museum with archaeological remains within, taking in consideration the visual impact on the site setting. Shelters could be used to the remains of the palace with its elements. As for reburial, it will make the process of deterioration slower below ground. Hence, it will give a long-term protection with minimum resources. Any water movement through the ground, materials and depth of cover required should be studied. This type could be used for the exit's ruins of the bath.

6-4 Touristic Development: The region suffers from negligence in promoting its cultural, architectural and historic significance. It is lacks of facilities that encourage visitors to enjoy the heritage of the area. There is a need to communicate the social and cultural values of Al Muwaqqar to the local and visitors in a consistent in coordinated and inspirational way. It is important to involve the local community in communicating the values of their region and their heritage. Hence, this will create effective Interaction between tourism development and community. It is essential to educate the surrounding community concerning these values in addition to growing awareness of the value of the antiquities. The site requires programs for visitors to introduce them to the Umayyad monuments in cooperation with local residents.It needs urgent solution to restore the heritage remains and conserve them. It is necessary to generate its role within the archaeological map in Jordan.This is through linking AlMuwaqqar Palace with the neighboring palaces within one tourist map. One intriguing example could be done is to establish a center

for visitors to familiarize themselves with the region's heritage. This could involve local residents in presenting and promoting their heritage as a way to increase their awareness of its importance and archaeological value. The region could be supported by guiding signs to highlight its historical features.

Bibliography

- **Arce, I. (2006).** *Umayyad Building Techniques and the Merging of Roman-Byzantine and Parthian-Sassanian Traditions: Continuity and Change,* L. Lavan, E. Zanini & A. Sarantis (eds.): Technology in transition. AD 300-650. Late Antique Archaeology 4, leyden, pp. 491-537.
- **Arce, I. (2015).** *The Umayyad baths at Amman Citadel and Hammam al-Sarah*, Syria, 92, Pp.133-168.
- **Azar, H - Najjar, M. al- - Qossus, R. (1989).** *Preliminary report on the result of archaeological excavations in Muwaqqar(arabic).* In: Annual of the Department of Antiquities 33, pp. 5-29.
- **Barsanti, C. (2007):** La scultura architettonica di epoca omayyade tra Bisanzio e la Persia sasanide: I capitelli di Qasr al Muwaqqar in Giordania, in: Arturo Carlo Quintaville, ed., Medioevo mediterraneo: l'Occidente, Bisanzio e l'Islam, (Milano: Electa), pp. 436-446.
- **-Bartl, K. - Bisheh, G. - Bloch, F. - Richter, T. (2013)** Qasr Mushash Survey: *First result of archaeological fieldwork in 2011 and 2012*. In: Annual of the Department of Antiquities 57, pp. 179-193.
- **Bisheh, G. (1992).** *The Umayyad Monuments between al-Muwaqqa and Azraq: Palatial Residences or Caravanserails?,* in: The Near East in Antiquity, vol. III, ed. S. Kerner, Amman: Al-Kutbah, 1992, 99. 35-41.
- **Bisheh, G. – Kehrberg, I. – Tohme, L. - Zayadine, F. (2000).** *The Umayyads and their Christian Subjects*, in: The Umay-yads: The Rise of Islamic Art, Amman: Ministry of Tourism, Department of Antiquities Amman, Jordan - Vienna: Museum with No Frontiers, 2000, 77-93.
- **Biswas, K. (1985).** *Ancient Urban Water Supply Systems.* Oxford: Reidel Publishing Company. Bosworth, C. E. (1993). Al-Muwaqqar, in: Encycplopedia of Islam, vol. VII, col. 806-809.
- **Brünnow, E. R. –von Domaszewski, A. (1904-1909).** *Die Provincia Arabia* Vols. I-III, pp.182-189. Strassburg: Trübner.
- **Creswell, J. W. (2002, 4 2012).** *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research* 2002. 4th edition, 2012, Brantford: Ross MacDonald School Resource Services Library.
- **Creswell, K. A. C. (1932, 2 1969).** *Early Muslim Architecture* Vol. I, part II, Cambridge 1932 – 2 nd edition, 1969, pp.993-997.
- **Dodoni, S.(2000).** *Qasr al- Muwaqqar: una contestualizione storica,* in: Annali di Ca' Foscari. Rivista della Facolta di Lingue e Letterature Straniere dell' Universita Ca' Foscari di Venezia, 39, 2000, pp. 155-168.

- **Encycplopedia of Islam,** new (2nd) edition, ed. C. E. Bosworth - E. van Donzel - B. Lewis et alii, Vol. V, Leiden 1993: Leyden: E. J. Brill, supplemented by E. van Donzel, Islamic desk reference: compiled from The Encyclopaedia of Islam, Leiden: E. J. Brill, 1994. p.860 (entry on Muwaqqar).
- **Giovanna, P – Gaetano, P. (2016).** *Quṣayr 'Amra Conservation Project*: 2010 – 2014. In: Studies in the history and archaeological of Jordan, XIII, pp. 667-682.
- **Groat, L - Wang, D. (2002, 2013).** *Architectural Research Methods*. 2002 - 2nd edition,2013, Hoboken : Wiley.
- **Hamilton, R.W., (1946a).** *An eighth century Water-Gauge at al-Muwaqqar*, in: Quarterly of the Department of Antiquities in Palestine, 11, pp. 1-19.
- **Hamilton, R. W. (1948b).** *Some eighth-Century – Capitals from al-Muwaqqar,* In: Quarterly of the Department of Antiquities in Palestine, 12, pp.63-69.
- **Harand, M. - De Vries, M. (2014).** *An Appraisal of Qualifying Role of Hydraulic Heritage Systems*. Mekelweg: Delft University of Technology.
- **Harding, L. (1967).** *The Antiquities Of Jordan*. New York : Praeger.
- **Herzfeld, E. (1910).** *Die Genesis der islamischen Kunst und das Mschatta-Problem*,in: Der Islam 1, 1910, pp. 27–63 and 105–44.
- **Hill, J. G. (1896).** *A Journey East of the River Jordan and the Dead Sea,* 1895, in: Palestine Exploration Fund, Quarterly Statement vo. 28.1 (January 1896) John, pp. 24-46, esp. pp. 30-31.
- **Imbert, F. (1999).** „Quand les pierres racontent les débuts de l'islam", in: Dossiers d'Archéologie, n° 244, 1999, p. 8.
- ***IHSJ*** - Islamic Heritage Sites in Jordan: A Student's Gazetteer prepared by the MAStudents of The German-Jordanian University in Architectural Conservation Academic Years 2017 – 2020, School for Architecture and Built Environment, ed. Th. M. WeberKaryotakis – A. Khammash et al., Amman 2020 (forthcoming).
- **Jaussen, A. – Savignac, M. R. (1922),** *Mission archéologgique en Arabie*, Vol. III: Les châteaux arabes de Qeseir ,Amra, Haraneh et Tuba, Paris: E. Leroux 1922.
- **Kakish, R. (2007).** 'Amara al-knas wa malifatiah fi al-'Urdun: fi al-'ahadin al-Bizanti wa 'Umawi ("Church Architecture and Decoration in Jordan in the Byzantine and Umayyad periods", Arabic), Amman: 2007.
- **King, G. (1982).** *Preliminary report on a survey of Byzantine and islamic times in Jordan*. In: Annuals of the Department of Antiquities of Jordan, 26, pp.85-96.
- **King, G.R.D. (1992).** *Settlement Patterns in Islamic Jordan*: the Umayyads and their Use of the Land. Studies in the History and Archaeology of Jordan, IV, pp. 369-375.

- **Mays, L.W - Koutsoyiannis, D. - Angelakis, A. N. (2007).** *A brief History of urban Water Supply in Antiquity*. Water Science and Technology: Water Supply, 7 (1), 1–12.
- **Musil, A. (1902).** Ḳuṣejr ʿAmra und andere Schlösser östlich von Moab: Topographischer Reisebericht, Vienna: Österreichische Akademie der Wissenschaften, 1902. Musil, A. (1907): Kuseir ʻAmra, vols. I-II. Vienna: K.K. Hof- und Staatsdruckerei, 1907.
- **Musil, A. (1907-1908).** *Arabia Petraea*, I.: Moab, Topographischer Reisebericht, Vienna 1907; II.: Edom, III.: Ethnologischer Reisebericht, Vienna 1908.
- **Najjar, M. (1989).** *Abbasid pottery from Al-Muwaqqar*. In: Annual of the Department of Antiquities of Jordan, 33, pp. 305-322.
- **Ritter, R. (2016).** Umayyad Foundation Inscriptions and the Inscription of al-Walīd from Khirbat al-Minya : Text, Usage, Visual Form", in: Hans- Peter Kuhnen (ed.), Khirbat alMinya: Der Umayyad enpalast am See Genezareth, coll. Orient-Archäologie, 36, Rahden/Westfalen.
- **Shahîd, I. (1995).** *Byzantium and the Arabs in the Sixth Century*, Volume 2, Part 2, Cambridge / Mass.: Harvard University Press, 1995.
- **Srivastava, A. -Thomson, S. B. (2009).** Framework Analysis: *A Qualitative Methodology for Applied Policy Research* (2 Jan, 2009). Journal of Administration and Governance, Vol. 4. Pp.72-79.
- **Shdaifat, al-, Y.** Mu'tah UniversityExcavations at Shu-qaira Algharbyyah - Preliminary Report on the 2005 Season, in: Annual of the Department of Antiquities of Jordan, 50, 2006, 205-216.
- **-Tagram, R. (2004).** *The Stylistic Origins of Umayyad Sculpture and Architectural Decoration*, Part 1, Wiesbaden: Otto Harrassowitz Verlag.
- **Waheeb, M. (1993).** *Second Season of archaeological Excavations in Muwaqqar* (arabic),
- in: Annual of the Department of Antiquities of Jordan, 7, pp.198-224.
- **Weber, Th. (1993)**. Damaskòs Pòlis Epìsemos'. Hellenistische, römische und byzantinische Bauwerke in Damaskus aus der Sicht griechischer und lateinischer Schriftquellen", in Damaszener Mitteilungen 7, 1993, pp. 135-176.
- **Weber, Th. M. (2002):** *Gadara Decapolitana*. Abhandlungen des Deutschen Palästinavereins , Vol. XXX, Wiesbaden: Harrassowitz Verlag.