

## Documentation of Jordan's Great Wall by Aerial Photography Techniques

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### Abstract

The use of aerial photography in the archaeological survey and documentation is considered as an important field in Jordan and it is gaining increasing attention in the Middle East Region. Recently, there are some projects implemented in Jordan using aerial technologies in the archaeological documentation field. The Jordan Wall Documentation Project, which tends to rely on modern technology and its contributions to the documentation process; is one of these projects in which this technology is applied directly and in cooperation with the relevant parties. This paper will focus on the outputs of the project, which aims to use this technology for facilitating the process of planning and documenting the archaeological sites through the Remote Sensing Software (RSS), the Digital Information systems, and the Geographical Information GIS, in addition to being documented with high accuracy on the Global Positioning System (GPS). This unique technology, is available in Jordan, at the Hashemite University, and Al al-Bayt University, for enhancing the role of archaeologists in the study and research of antiquities in the area of southern Jordan, where the discovered wall is located. That opens up the future in the archaeological exploration process, in addition to its importance in providing a valuable database of digital images for researchers, experts and graduate students.

**Keywords:** Documentation, Archaeology, Aerial Photography, Nabatean Age.

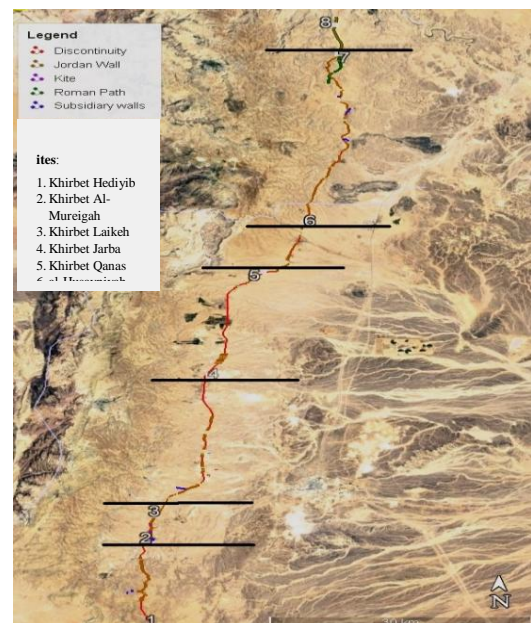
### Introduction

The Great Wall of Jordan (formerly Shabib Line) was initially ambiguous due to the lack of studies, despite the presence of preliminary reports or observations about it since 1948 AD, but it was not enough and despite the passage of 72 years since its appearance neither systematic ground survey or excavations and restoration work conducted in the locality.

After several centuries of its establishment and construction, the wall is still before the beginning of its documentation of this project without a clear answer about the purpose & function of its construction. The exact date of the wall was been a matter of debate so the controversy over the period and the goals will contribute to and shed light on one of the longest walls in the Middle East named Jordan's Great Wall, formerly called by some scholars Shabib Line (Frye:2018).

Therefore, this project& study that has been going on from 1992- to 1996 and from 2020to 2023 came to answer these questions and put an end to the mystery that spread about this long wall.<sup>1</sup>

The wall, with its details and its various parts, components & stages, still constitutes an opportunity for Jordanian researchers and scholars all over the world to try to make more efforts to explain it, in terms of being a military defensive wall, or a border that separates the Badia (semi-desert ) from agricultural lands, or a commercial line linked to the old routes and stations such as incense route.



<sup>1</sup>The project headed by Dr Mohammed Waheeb from Hashemite university & Dr Eng.Muhanad Trrad from Al-Bayt University, &funded byMinistry of Higher Education, and Scientific Research, the Scientific Research and Innovation Support Fund 2022, from 1/1/2022-31/12/2022 in collaboration with Hashemite university &Al Al-Bayt University.

Map1: The line of the Jordan's wall, divided to seven

What increases the excitement of this wall is the presence of various buildings on both sides, such as towers, agricultural villages, shelters, water facilities, kites and other structures along its length from the beginning of Ras al-Naqab area (Bisheh et al:1993) to the end near Wadi al-Hasa in the north.

### ***Aerial Documentation Of The Jordan Wall***

Aerial documentation by using photographs witnessed an increasing interest field among most of the archaeologists who are working in documenting archaeological remains from the air in the world and specifically in the Middle East Countries such as Jordan as case study. It is also called airborne imagery the main function of this documentation type is taking of [photographs](#) high above the targeted site such as this wall or area from an [aircraft](#) or other [airborne](#) platforms, it is also known among the experts as aerial videography.

Platforms for aerial photography documentation could be classified under the following categories:

- A- By using Aircraft, and [helicopters](#).
- B- [Unmanned aerial vehicles](#) short range.
- C- Unmanned aerial vehicle medium-altitude endurance.
- D- Unmanned aerial vehicle.
- E- (UAVs or, drones"), [balloons](#) [blimps](#) and [dirigibles](#), [rockets](#)
- F- [Pigeons](#), [kites](#), or using.
- G- [Action cameras](#) while [skydiving](#) or [wing suiting](#).

The photographer or the field director of operation while mounted cameras for photographing either he could [be operated](#) or triggered the camera automatically.

Aerial photography for Jordan's wall could be described as [bird's-eye view](#) images that intensively focus on:

- A- [The](#) main wall route from Ras al-Naqab in the south to Wadi Hasa to the north. The other associated structures built along both sides of the wall such as towers, other sub-divisions wall branches, gates, kites, village sites, water installations or even modern structures built later after the completion of the wall during the Nabatean Period. (Map,1)
- B- Other nearby [surface](#) objects, at a distance of about 500 m away from the wall on both sides. It should be noted that aerial photography is different from the type which is known as [air-to-air photography](#).



Fig 1: The wall remains in the Ras al-Naqab area of south Jordan during the winter season 2023 (Waheeb,2023)

### ***Methodology:***

- 1- Using Aerial photography in documenting the remains of the wall and its associated structures from Wadi Hasa to the Ras al-Naqab area. See (Fig 4).
- 2- Documenting the route line of the wall crossing southern Jordan through public and private land plots from its beginning in Ras al-Naqab near Ma'an City (Waheeb:2012) to its supposed end in Wadi Al-Hasa within the Tafila governorate.
- 3- Preparing a comprehensive report on the wall, its different names and details of the surrounding sites or structures still standing like village sites, watchtowers, kites, etc. ... from Ras al-Naqab to al-Hasa. (Gebel:1993).
- 4- Involvement of the local community in the governorate of Ma'an & Tafila in and the villages of Ras al-Naqab and countryside in particular in protecting the wall and raising public awareness among these communities.
- 5- Presenting a number of lectures in cooperation with local schools, universities, educational centers, and clubs in the study area, also providing them with a valuable database about the wall & its interpretation.
- 6- Publishing the data in Books, Booklets, and articles about the wall, its importance, and function as the second-longest wall in the region and the world, also providing Ras Al-Naqab Military School Museum with published new data, as well as schools within a series of scientific publications on the following:

### **Objectives of the Project or Study:**

First: Prepare a tourist brochure including the route or line of the wall connecting Ras Al-Naqab with Khirbet Al-Mureigah, dividing the wall route into sections & stages, so the wall finally reaching Wadi Al-Hasa as the end point. By using scientific methodology of documentation, the team aims to facilitate its study, also to involve more Jordanian academics bodies in documenting the wall structures in the future.

Second: Preparing a booklet and a series of books that includes several chapters on the importance of the wall, its extension, the sites, and its functions on both sides, how enable the local community to benefit from its tourism development, so the current research falls within this framework.

Third: Preparing informational posters to be distributed to the schools through which the wall passes in order to achieve the following:

- 1- Spreading public awareness of its importance and its preservation in, Ma'an, Shobak, Tafileh, Huseinyeh, Jurf al-Daraweish, Hasa ... etc.
- 2- Encouraging domestic tourism and travel to nominate the wall as a tourist destination in cooperation with the Ministry of Tourism, Jordan Tour Guide Association & other related stakeholders.
- 3- Encouraging inbound tourism to the region to benefit the local communities from its economies.
- 4- Preparing a short video or a CD containing an explanation of the wall and its importance, presented within the programs of, conferences, seminars, lectures and other workshops in Jordan & the region.

### **Aerial Photography & Function Of The Jordan's Wall**

The Great Historic Wall of Jordan, which is commonly referred to as "Khat Shabib" has attracted the attention of travelers who saw the remains along with the extension of the southern region of Jordan, among of them were researchers, visitors, specialists and experts of history and heritage. The needs arise for detailed studies about the wall in order to identify its different parts and associated structures. It is concerned with:

- 1- Notes and preliminary documentation made by the English Diplomat (Alec Kirkbride) from the air in 1948 and published limited data in the magazine (Kirkbride, 1948)
- 2- Find later refers to the wall near Kh Qanas near Shoubek through his survey (DAS) dated the wall to Iron Age. (Find later 2002, 142-143)
- 3- The wall Mentioned by Tafila-Busayra Archaeological Survey (MacDonald et al. 2000), also mentioned in a survey guided by (Abudanh, 2004)
- 4- Lancaster Harding mentions the wall in his unpublished reports and archive, which contained his memoirs and fieldwork, recently collected in a volume entitled (A Journey to the Past / with Lancaster Harding pages) (Harun and al-Syouf, 2015).

Harding added : ( During the flight over Ma'an area, it was noticed that there was a long wall (12 km) to the west of the city of Ma'an extending longitudinally, and after asking the residents, or the local she found that this wall is known as Khat Shabib (Sur Shabib). Some believe that it is attributed to Prince Shabib al-Tab'ai al-Himyari) (Harun and al-Seyouf, 2015).

Also, Harding mentions that he spoke with Mr. Muhammad Pasha Al-Shuraqi, the Jordanian Minister of Foreign Affairs at the time, where the Minister Al- Shuraqi informed him after checking some historical sources dated to the middle of the tenth century AD, that Prince Shabib Al-Uqeili Al-Ta'bai ruled Amman and Al-Balqa on behalf of Kafour Al-Akhshidi, the ruler of Egypt at the time. Kafur after that revolted towards Damascus and it was subject to the rule of Kafur Al-Akhshidi, but Prince Shabib died while he was going with the army towards Damascus, and some believe that he died of poisoning.

Harding mentions, quoting from Al-Shurqi, a poem by the Great Arab Poet Al-Mutanabbi, praising Kafur Al-Akhshidi after the death of Prince Shabib.

After visiting the site of Khat Shabib by Harding (Shabeib Wall) and examining it, he described his view as follows: (One course of uncut stone, standing directly on the ground, with a width of 2 m. There is a huge stone in the middle at a rate of every 5 meters. This wall overlaps with some roads some of the interpretations circulating this line suggest that it may separate the fertile and cultivated lands from the lands of the desert, while others believe that it is a demarcation line.

Harding continues in another place in his memoirs saying that there is another wall line in Jordan, this line starts in the Wadi Al-Seer area and passes Naour Town and even Hesban (see Harun and Al-Seyouf, 2015). Harding also mentioned another wall on the western fringe of the Harret al-Shaam. The wall appeared on a map published in during 1949 according Harding (running in a very straight line to the northeast of Qasr el-Hallabat and in a northeast alignment) The wall length at least 8 km long, with small structures on both sides, dated to Roman period and used for military purposes (Harding, 1967).

3- Studies through aerial photography conducted by the British David Kennedy in 1982 while documenting the remains of the Roman Civilization in northeastern Jordan from air, he noticed this unique wall, and later briefly published information in the archaeological reports (Kennedy :2015).

5- Field surveys of the Jordanian Department of Antiquities were carried out under direct supervision of Dr Waheeb and his team in 1992 during the survey of the Ras al-Naqab – Aqaba project, preliminary results were published in ADAJ, etc (Waheeb, 1993,1996,1997)

David Kennedy again initiated more work in Jordan in 1997 when the Royal Jordanian Air Force provided a flight explicitly for reconnaissance of archaeological sites (Kennedy:2015)

The Jordanian researcher, Dr Raouf Abu Jaber refers to the wall briefly in an article about water harvesting in the communities of dry areas in 1995 in Studies in the History and Archaeology of Jordan (Abu Jabber, 1992; 1995)

6- The researcher Waheeb also referred to the Ras al-Naqab area and its importance through the field projects that he implemented in the area through his work in Ministry of Tourism and Antiquities / Department of Antiquities and published some articles, book and unpublished reports entitled the Jordan Wall - KhatShabib, Archaeological Excavations in Ras al-Naqab.

7- Kennedy returned, in partnership with Boley in 2004, to photograph the wall from the air, where he briefly referred to the wall in the book entitled (Ancient Jordan from the Air). (Kenedy, 2004)

8- In 2005, the American Burton MacDonald and his team conducted a survey of southern Jordan in the Ras Al-Naqab region, MacDonald indicated that the wall is located to the east of Khirbet Ayl and that this wall is heading north-south, then he refers to several sites located next to the wall , the most prominent sites that cross the wall next to it, according to the field number (1, 37, 43, 91). 102, 311, 312, 317, 324) (Macdonald: 2005))

9- An attempt was also made to date the wall without excavation, under the supervision of researcher Sahar Al-Khasawneh, with the participation of others, in 2019, where the results indicated that the wall dates back to the Iron Age, especially the period between 539-332, i.e., the Persian period. (Khasawneh, 2019)

10- Waheeb again with his Jordanian national team 2020 conducted the assessment work under the supervision of a supplementary study of the wall from the tourist point of view, in cooperation with the Ministry of Tourism and Antiquities, the Directorate of Military Education and Culture, Jordan Tour Guide Association and several national institutions and academics. (Waheeb, 2020)

Accordingly, the Great Wall of Jordan / Khat Shabib has received sporadic and non-continuous attention from scholars with limited interests, as the research did not take into consideration a comprehensive and detailed study on ground, really in order to benefit from the results of this study in field of tourism economy, its necessary to carry out a comprehensive detailed assessment for development purposes.



Fig 2: The wall in the north near Wadi Hasa in al -Magel Area. (Abu Shawish:2018)

### ***Jordans Wall Names***

The local community, in turn, expresses its opinion on the reality of the function of the wall by adding to their colloquial name (Khat Shabib), as they call it also (Hablat Shabib, Shabeib Line), which was originally taken from the older name Khat Shabib, while Hablat Shabib refers to the long rope known to the resident population.

In the areas from which they cross, one of the respondents in the Ras Al-Naqab area, (Mr Hassan Al-Khawaldeh), stated that the name of the area (Al-Habla) is not meant by the elevated area, but rather the rope, which refers to the shape of the wall that extends in the form of a curved and twisted rope that the local people use in building tents, luggage hooks and other daily uses.

The residents thus refer to what is common in the simple folk tale that usually spreads in the countryside to explain some of the cultural or natural phenomena and features.



The meaning of this story is that the builder of the wall /line is Shabeib or Prince Shabib, and perhaps this name dates back the history of this wall to Islamic times, considering Shabeib was present during the period of the Islamic eras following the period of the early Islamic period, starting from the Umayyad era, the Abbasid, the Ayyubid Mamluk, then the Fatimid, all the way to the Ottoman period and the modern era. The wall, the name just a projection on an old wall unrelated to Shabeib, who became famous in the East, and large buildings became called after him, such as Shabib Palace in the center of Zarqa City, (Waheeb:2011) Shabeib line, and Shabib rope or KhattShabib.

For other places, where some researchers refer to areas located west of Amman, specifically west of Iraq Al-Amir village, Wadi Al-Seer and Hesban, the area still called by local inhabitants as Khat Shabeib, despite the absence of a wall or a well-defined building on the surface of the ground.(Harding :2015)

Really there is no relation between the name and the construction date of the wall, the name dated back to the Ottoman period, while the structure of the wall dated back to the Nabatean Period between the 2<sup>nd</sup> BC -1<sup>st</sup> century AD.

This date of Nabatean is based on field operations conducted since 1992 onward, such as archaeological survey, archaeological excavations in Ras al-Naqab area in targeted sites dated back to the Nabatean Period for example, DabbatHanut,AbuNusur, Hiyeyeed, Hayad, Abu –Lusun ..etc.. The recovered materials from these field explorations mostly Nabatean pottery dominant & associated to remains of buildings among of them settlement villages, towers, water installations, & remains of farms.

<b>K Lines</b>	<ul style="list-style-type: none"> <li>• The researcher Avernari gave this name to the wall that he found during his surveys in the Negev desert (Palestine) in relation to the area in which he found it K Area (Evernari 1958).</li> <li>• The researcher Fuji also used the same name during the survey of the Jafr area. (Fuji 2004)</li> <li>• This area is also known by the classification of Jordanian and other scholars as the area K (Haiman 2000)</li> </ul>
<b>Khatt Shabib</b>	<ul style="list-style-type: none"> <li>• It is known locally in the areas of Ras al-Naqab, al-Shobak, and Ma'an in general, and the eastern side of the Tafila governorate in al-Hasa, and is dated to the period of Islamic times. (Abu Jaber, 1992; 1995; Kirkbride, 1948).</li> <li>• It is attributed to Prince Shabib, who imposed his control over the region and his project was not completed, and the wall remained a witness on it.</li> </ul>
<b>Habla shabib</b>	<ul style="list-style-type: none"> <li>• A designation given by the residents of the areas adjacent to the path of the wall, because it resembles a long stretched rope (Personal interview, 2020; Fujii, 2004)</li> <li>• Local communities weave popular stories around this wall/line and point out that it was a path for pilgrimage to Mecca that guides pilgrims to the Holy Land. (Personal interview, 2020)</li> </ul>
<b>Haret Burma,kl : 112</b>	<ul style="list-style-type: none"> <li>• A name given by the Japanese researcher Fuji Sumi; in the Al-Jafr area near Al-Husayniyya / Burma, and he called the lines “k” line, after the name on the Naqab Heights of Palestine. He indicated the importance of this western line in religious rituals in the Middle Bronze Ages. (Fuji, 2004)</li> </ul>
<b>Graet Wall of Jordan</b>	<ul style="list-style-type: none"> <li>• A designation launched by the Department of Antiquities team, who supervised the archaeological excavations in the Ras al-Naqab area (Waheeb, 1996; 1990; 1992)</li> <li>• The team has confirmed that the wall dates back to the Nabataean era, based on the results of archaeological surveys and techniques that were carried out in Ras al-Naqab in Abu al-Nusour, Abu al-Lisun, al-Hayyid, al-Da'ouk and others.</li> </ul>

Pl. 1: Table showing the names through the time used for Jordans wall



Fig 3: The end point of the wall near Wadi Hasa close to the Roman Miles Stones (Waheeb, 2022)

### **Results:**

The Wall divided into seven sections or stages in order to focus on each section & its associated structures on both sides, also to give more details about the types of these remains which is still existed above ground till nowadays:

Section 1: From Hediyyib near Shdeiyid & Daouk – Al-Mureigha village Site

Section 2: Al-Mureigha- Laiekeh

Section 3: Laiekeh-KhJarba,

Section 4: Jarba -KhQanas (Fujeij, 2004)

Section 5: KhQanas (Fujeij)-Jabal al-Hala (Jurf al-Darawish),

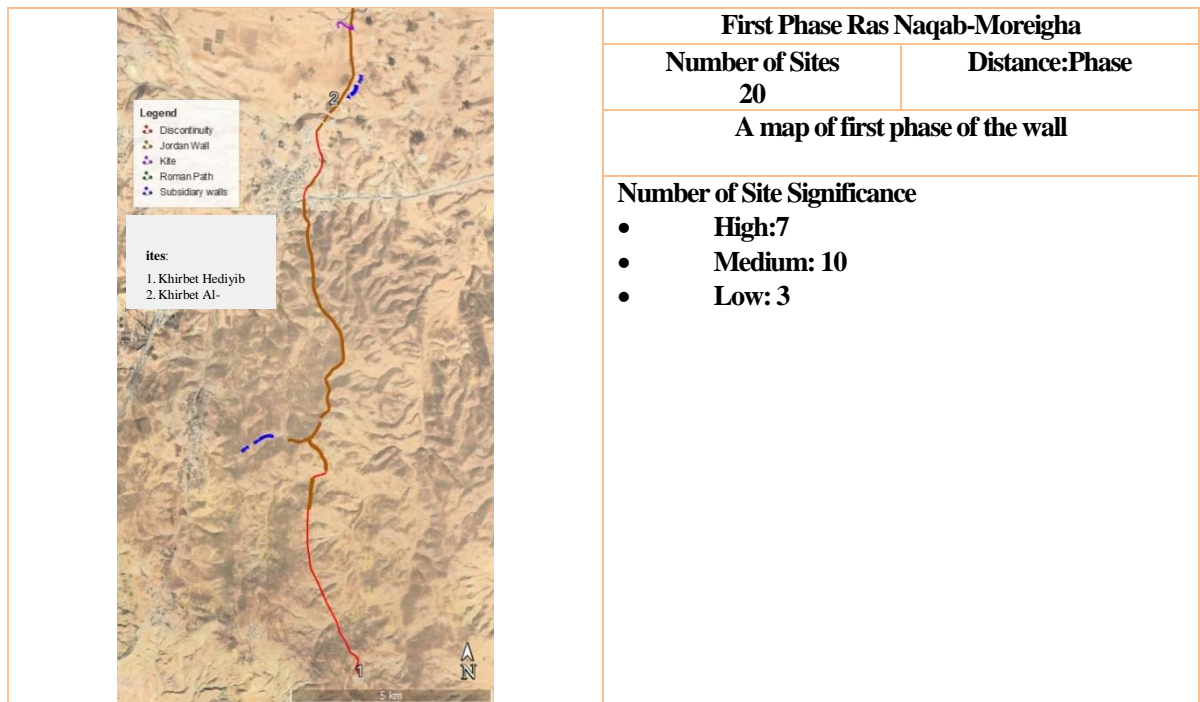
Section 6: Jabal al-Hala (Jurf al-Darawish)-Kh al Hala (Umm al-Azam Area),

Section 7: Kh al Hala (Umm al-Azam Area)- to Wadi Hasa (Still standing Milestone Area).

Section 1: From Hediyyib near Shdeiyid & Daouk – Al-Mureigha village Site.

By using aerial photos and ground field assessment survey as well as field visits, the wall extends over a distance ranging approximately 150 km, starting from the Ras al-Naqab area in the south of Ma'an governorate, from the highlands area to the Wadi al-Hasa plain in the Tafila governorate to the north. The study revealed 16 sites in section one only, six of them are large and village sites found on both sides at a distance of approximately 1 km from the wall, while the rest are small- medium sites found on both sides of the wall line at a distance of 500m. The wall passes near the village sites of Hediyyib, Shdeiyid, Daouk, & al-Mureigha, and then in section 2: passes near laiekeh Udruh, al-Jarba, etc... The wall continues to cross through new villages such as al-Muhammadiyah, al-Husayniyah, Jurf al-Darwish, al-Shoubak and al-Fujeej, to al-Allia, al-Hala, al-Faredyeh then to Wadi al-Hasa. It was built in a semi zigzag sometimes or twisty shape that corresponds to the geographical nature of the areas it crosses, as it traverses a number of mountains, plains, valleys, foothills and cliffs without interruption, except for the recent destruction of some of its parts here and there by construction of paved roads.

The wall cross in its line from Ras al-Naqab near Khirbet Shedeid and al-Daouk, the modern international road, the highway coming from Ma'an and heading to the Aqaba governorate in Ras al-Naqab, where it intersects with the paved Street opposite the Prince Hashem bin Al Hussein Military School in the town of Al-Mureigha. It is noted that the length of the wall connected in one direction is around (106) kilometers, but adding other branches associated with the main line the total length becomes approximately 150 km.



Pl,2 : Showing the documented sites of phase one of Jordans Wall

Another opinion that is implied, the wall was built in different phases or stages through Ages, so that its construction took a long period of time. Discovered parts of limited wall line near Jabal Burma on the eastern side of the highway refers clearly to the early attempts to construct a wall in southern Jordan through the Bronze Age, then the practice of construction after 3 thousand years shifted from eastern side of the highway to the western side during the Nabatean Period. Possibly the topography of the ground on the western side is suitable more than the eastern side topography. (Fuji :2002; 2004).

Whether the construction of the wall was completed, or did it stop at Wadi Al-Hasa only representing a phase of the work? This question needs more investigations during the ongoing field study.

**DESCRIPTION OF THE WALL BY AERIAL AND FIELD SURVEY IN RAS AL-NAQAB:  
(PHASE ONE): From Qurein, Hediyyib near Shdeiyid & Daouk – to Al-Mureigha village Site:**

The wall rises from the heights of Ras al-Naqab overlooking the Qaa al-Naqab area, where the famous Roman, Nabatean, and Islamic - Abbasid site of al-Humima is located. The wall headed north passes close to Khirbet Qurein, Shadeid and al-Daouk, then continues descending through Qaa al-Naqab, after that ascending and passing Jabal Mutawaq continue to the western edge of KhirbetDaouk (Southern & Northern Towers) then slightly start descending to Sfaia area, where we found towers, enclosures, small structures and several small sites reused during later periods of the Nabatean Period. The wall continues opposite Khirbat Abu al-Lusun, to western and eastern Fuweila, reaching Umm Quseir watch towers Here the wall close to the military school begins to turn & descend gradually to the west (Curvy Shape) after crossing the paved highwayman -Aqaba Road to the modern town of Al-Moreigha. The team noticed wall disappear inside the modern houses of al-Mureigha Town, then rise again in a deep valley reaching Kh al-Mureigha the major village on the western side of the wall. Here the first phase of the wall ended.

**Table1: FirstPhase, list of found sites during assessment &evaluation.**

UTM COORDINATES	SITE DATE	SITE NAME	SITE NO	PHSE
36746832.77-316880.32	Iron Age 11C, Roman, early+LateIslamic	KhShdeid	1.	First Phase Ras Naqab- Moregha
36745109- 3319938	Nabat+Classic	Kh Qurein	2.	
36742590- 3321799	EB_MB	Ras Naqab Kite 1	3.	
36742289- 3321974	EB-MB	Ras Naqab Kite 2	4.	
36742062- 3325275	Nab+ Classic	Key Site 1	5.	
36742310 3325434	Nab+ Classic	Key site 2	6.	
36742398 3325500	Nab+ Classic + Neolithic	Key Site 3	7.	
36743569 3325500	Nab+ Classic	Jabal Mutawaq	8.	
36744026 3325949	(Nab)	Daouk S Tower	9.	
3326166-360744183	Nab+ Classic + Neolithic	Kh Daouk	10.	
36744166- 3326387	Nabatean	Sfia Tower9 ,Daouk N Tower	11.	
36744153- 3327191	Nabatean	Sfia Tower8	12.	
36744547 3327536	Nabatean	Sfia Tower7	13.	
36744570-3327670	Nabatean	Sfia Tower6	14.	
36744583.89- 3327809.40	Nabatean	Sfia Tower5	15.	
36744590- 3327824	Nabatean	Sfia Tower4	16.	
36744214- 3328610	Nabatean	Sfia Tower3	17.	
36743932- 3328972	Nabatean	Sfia Tower2	18.	
36743821- 3329255	Nabatean	Sfia Tower	19.	
3330853.21 - 36743549.18	Nabatean+ Classic	Um Quseir Towers	20.	
36744256 3333847	(pal lithic Old + Medium ,Early Bronze ,MB+ Iron Age ,Hellenstic+ Nabatean +Roman +Byzantine + Islamic Early-Late)	Kh Moregha	21.	
36744574.39 3333977.13	(UD)	Parallel Wall	22.	



Fig 4: The Drone and methodology of photography at the beginning of the Jordan Wall area in Ras an-Naqab(2020)

During the field study of this phase, it was concluded that the structures around the wall are small in size related to the construction of the wall itself, but the real function and history of these sites must be decided and answered later, as the current stage is not a stage of archaeological excavations, so that it is impossible to definitively confirm the scarcity of surface evidence that is read on the site and that helped in understanding the reality of these buildings.



Figure 4: The line of the wall in Ras al-Naqab and associated small buildings on both sides (Google Earth, 2020)  
It is noted here and in most of this section of the wall that there is lot of dirtroads crossing the wall by vehicles, these dirt roads have negative impacts on the wall which is still be used by local shepherds and nomadic people.

Despite that the remains of the wall are still clearly visible, marked, and prominent on the surface of the ground, the wall also severely suffered from direct and indirect threats caused by construction of new houses, and urban development; these factors still affected the wall negatively.

In this phase, the wall crosses solid rocky areas, this helped the workers to use the local limestone ashlars in building not only the wall but also the settlement site of Kh Daouk. Not only dirt roads affected the wall, but also the wall negatively affected by some modern structures, houses, workshops, modern sheep shelters. As soon as it reaches the Town, its features disappear for a distance of at least 1km, then the wall crossed again by the old paved road of Maan-Aqaba. Here the line of the wall descended sharply in the valley before it climbs again the slopes of khibet al-Mureigha to reach the village site. The valley here is active during the winter season and becomes dry in summer season.

Accordingly, in details the Jordan Wall, with its extension from Ras an-Naqab area until it reaches the major site of Kh al-Mureigha, has been negatively affected by the following factors:

- Natural factors such as the active valley, and flash flood occurring during winter season, therefore, the builders of the wall took into consideration leaving the bed of the valley courses without construction of ashlars, since it was threatened by running water in winter, so that the valley courses would form a gap in the line of the wall.
- Modern and industrial workshops, modern housing projects and farms represent a direct threat, so the wall urgently needs CRM procedure.
- Paved and dirt roads represent the most popular threat to the wall through all phases.



Fig 5: 3D view of the Umm Qusayr Site located on the western side of wall in Ras an-Naqab (Tarrad, 2022)

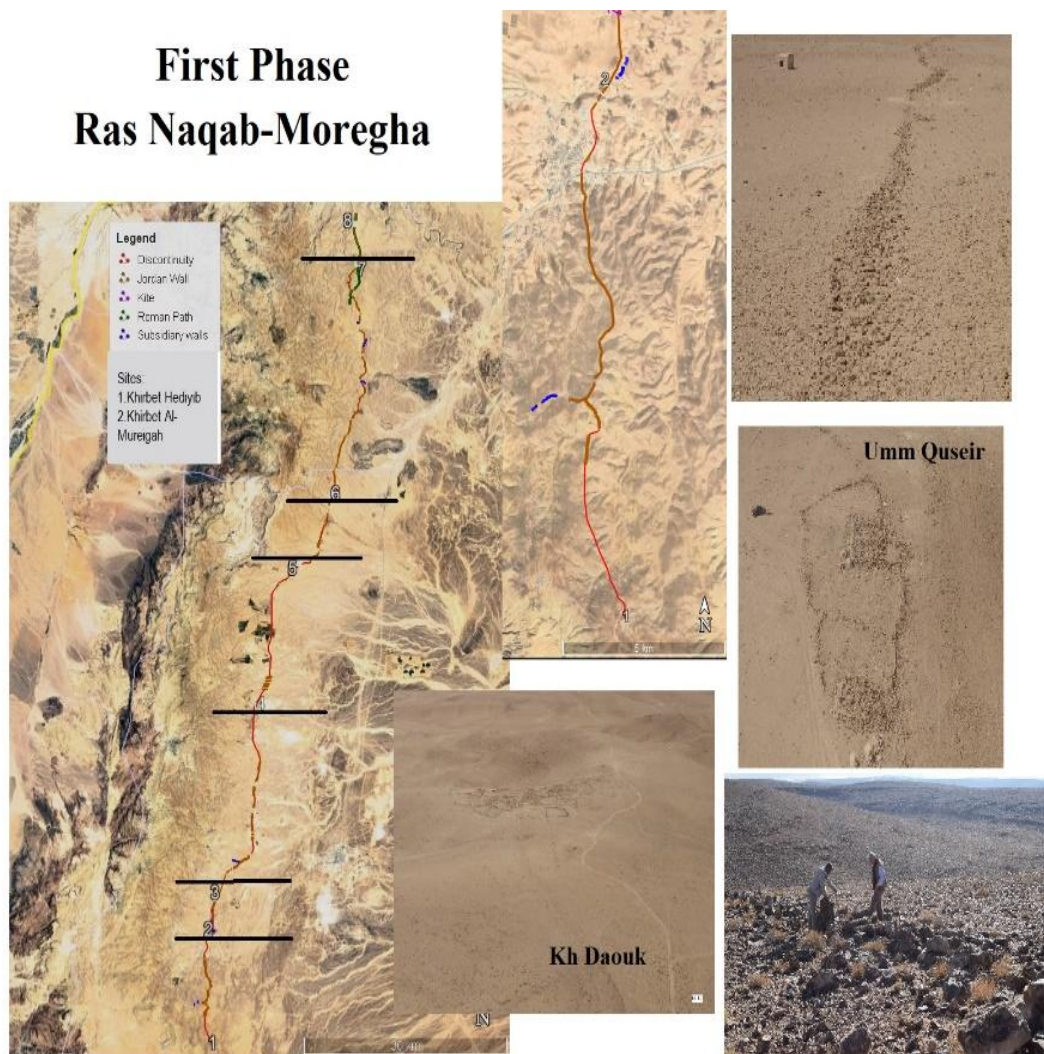


Fig 6: First Phase Ras Naqab-Moreigha, showing the remains of the wall and associated structures.

### **Discussion**

The question must be raised about the reality of the relationship of large buildings, especially villages, to the wall in terms of their size, location, and their connection or not with the wall, which will be answered in the coming publications of the wall series. Nevertheless we do not miss to pay attention to these villages that the wall crosses next to starting point in Ras Al-Naqab from the site of Khirbet Qreun, Shedeed, and Al-Daouk, as it is the main center from which the construction and reconstruction work began, and the relationship of these villages to the wall in terms of the population's link to a social, economic and political system linked to the civilization prevailing in those areas specially since it is currently prevalent that the area was under Nabataean sovereignty. The wall follows a gradual descending in altitude from south (1600m) to north (900m), so there is high possibility that the wall runs from south to north.

Despite what has been mentioned, the issue of the function of the Jordan Wall / Khat Shabib is still a subject of debate and controversy among experts, archaeologists, and specialists, as there are many opinions and propositions in this field, and we note that these propositions, sayings and theories still subject to investigations up till now days. Regarding the aerial photography the first study from the air using aerial photography carried out by Sir Kirkbride and Kennedy, and such studies suffer from a severe lack of information on ground and can only be relied upon by following them up with field studies, and practical application on the ground to verify aerial images in general, and then entering into accurate details such as measurements. The method of construction and surface findings for the purposes of history, and in general, it does not depend on the aerial study in the field of archeology, especially with regard to the Jordan wall, and that the results that have been reached need to be confirmed, evidence and clues to avoid speculation and assumption.

Finally, the project seeks to achieve various programs, and strategies that contribute directly to the development of the national tourism industry & creating an atmosphere of competition for the Jordanian tourism product and facilitating the preservation and maintenance of the remains, as well as creating a mechanism for cooperation with the relevant authorities to mitigate the risks to which the wall is exposed natural and human factors.

## References

- Abudanh, F. 2004 The Archaeological Survey for the Region of Udhruh, 2003 (Preliminary Report), Annual of the Department of Antiquities Jordan Vol 48, Pp. 51.
- Bisheh, G., Farajat, S., Palmumbo, G., Waheeb, M., (1993), "Archaeological rescue survey of the Ras an-Naqab Aqaba Highway Alignment 1992", ADAJ, Vol. 37, Pp. 119-131.
- Findlater, G. 2002 Limes Arabicus, Via Militaris and Resource Control in Southern Jordan, in: P. Freeman – J. Bennett – Z. T. Fiema – B. Hoffman, Limes XVIII. Proceedings of the XVIIIth International Congress of Roman Frontiers Studies held in Amman, Jordan (September 2000), British Archaeological Reports International Series 1084, Pp. 137–152.
- Fino, N 1996, AinJammam, Archaeological study, Jordan University, Unpublished MA thesis, Dept of Archaeology.
- Frye, David (2018). Walls: a history of civilization in blood and brick. London: Faber & Faber. ISBN 9781501172700. OCLC 1012798550.
- Fuji, S, 2002, QaabuTulyha west, an interim report of the fifth season, ADAJ, Vol. 46, Pp: 15-39.
- Fuji, S, 2004, Harrat Burma cairn field, wadi Burma south, cist enclosure and kite site, and Harrat al Sayyiya K lines, A preliminary report of 2003 summer season of the Jafer Basin, prehistoric project, phase 2, ADAJ, 48, Pp. 285-304.
- Gebel, Hans Georg K. (1993), Neolithic 'Ain Jamam near Ras an-Naqb: The Pre-1993 Field Research History, The Newsletter of Southwest Asian Neolithic Research.
- Glueck, N., 1934, "Explorations in eastern Palestine and Naqab, AASOR, Vol. 55, Pp. 3-12.
- Glueck, N., 1937, "An aerial reconnaissance in southern trans Jordan" AASOR, 67, 19-29.
- Graf, D., (1979), "A preliminary report on a survey of Nabatean- Roman military sites in southern Jordan", ADAJ, Vol. 23, Pp. 121-127.
- Harun, J. Sayouf, M, 2015, Memorians of Lankester Harding in Jordan, Amman -Jordan.
- Haiman, M. 2000 The 'K-line' at HarRomem in light of the Survey of the Map of Har Ramon (203), Atiqot Vol. 39, Pp. 21–29
- Harding, G. L. 1967, The Antiquities of Jordan 2 (London).
- Jobling, W., (1981), "Preliminary report on the archaeological survey between Ma'an and Aqaba", ADAJ, Vol. 25, Pp. 105-112.
- Kennedy, David; Banks, Rebecca (2015). "The KhattShebib in Jordan: From the Air and Space". Zeitschrift für Orient-Archäologie. 8: Pp. 132–154.
- Khasawneh, Sahar; Murray, Andrew; Abudana, Fawzi (2019). "A first radiometric chronology for the KhattShebib megalithic structure in Jordan using the luminescence dating of rock surfaces". Quaternary Geochronology. 49: Pp. 205–210.  
doi:10.1016/j.quageo.2018.02.007. ISSN 1871-1014.
- Kirkbride, A. (1948). KhattShabeeb in Transjordan Antiquity 151-154.
- Kirkbride, A. (1948). "Shebib's Wall in Trans Jordan" Antiquity. Vol. 22 (87), Pp. 151; 154  
doi:10.1017/S0003598X00019682. ISSN 0003-598
- MacDonald, Burton (2015). The Southern Transjordan Edomite Plateau and the Dead Sea Rift Valley: The Bronze Age to the Islamic Period. Havertown: Oxbow Books. p. 174. ISBN 9781782978350. OCLC 940437764.
- Macdonald. B Herr. L, Clark. G, Bradshaw. A; and Corbett. J. (2005), The Ayl to RasAnaqab Archaeological Survey, Phase 1, Preliminary Report, ADAJ, Vol. 49, Pp. 277-298.
- Oleson, J. P., 1995, "The origins and design of Nabatean water -supply system" in SHAJ, vol.5, Pp.707-717.
- The Aerial Archaeology in Jordan Project. EAMENA. 2016-12-05. Retrieved 2019-05-1
- Waheeb .M&Doleh. Y, (2010), QuseirShabeeb, American Journal of Archaeology, Vol 114,3,Pp. 517-518.
- Waheeb, M, Shawabkeh, Y, & Khair. H, (2010), The Discovery of QaserShabeeb, 1 edition, Amman, Published by Ministry of Culture –Jordan.
- Waheeb, M, M. & Fino, N. (1997). 'Ayn El-Jammam: A Neolithic site near RaselNaqb, southern Jordan. In The Prehistory of Jordan II: Perspectives from 1997, ed.
- Waheeb, M, (1996). "Archaeological Excavation at Ras an – Naqab – 'Aqaba Road Alignment: Preliminary Report (1995)", Annual of The Department of Antiquities of Jordan, 40, Pp. 339-348.
- Waheeb, M, Doleh, Y (1999). "Uniza- Shobak Road Archaeological Survey", American Journal of Archaeology, Vol, 103/3, Pp. 489.
- Waheeb, M, Zubi, Mahdi, New discoveries from Nabatean Age in Ras an-Naqab, Journal of Archaeologists Union, vol, 8, Pp 43-59.
- Waheeb, M. (1996), " Archaeological excavations at Ras an-Naqab Aqaba road alignment, preliminary report 1995 " , ADAJ, 40, 339-348.
- Waheeb, M Abu Dayyeh, (1997), "Recent Excavations at Ras anNaqab", American Journal of Archaeology, Vol. 101/3, Pp. 501-502.
- Waheeb. M, (1997), "Ayen el – Jammam A Neolithic Site Near Rasen- Naqab- southern Jordan, the prehistory of Jordan II: Pp. 215-220.

- Waheeb, M, (1997), Results of Field Excavations in Ras anNaqab, Report submitted to DAJ, 1997. Unpolished report.
- Waheeb. M, (2010), Quseir Shabeeb, American Journal of Archaeology, Vol 3,114, pp.517-518.
- Waheeb, M, (2011), The discovery of Wadi Zarqa Civilizations, Zarqa, Al khat Al- Arabi Press, Jordan.
- Waheeb, M, (2012), The Discovery of Maan Civilizations, Al-Jafer, Amman, Published by Ministry of Culture – Jordan.