A proposed Study to Rehabilitate and Management of Archaeological Hermopolis (El-Ashmonein) as an Open-air Museum

Mohammed Tharwat Mohammed Elsharief

Lecturer in Faculty of Fine arts, Minia University

muhmada.tharwat@mu.edu.eg

Abstract:

This paper explains how to rehabilitate Hermopolis' archaeological area for an open-air museum. To rehabilitate means to reuse old sites in general, including residential, commercial, or industrial buildings, through maintenance or development, while preserving the building's parts and elements that bear distinct historical, architectural, or cultural values through the ages since its establishment ,This research can be ascribed to multiple factors, including addresses a significant subject, namely the restoration and utilization of archaeological sites in El-Minia, one of the most unexplored tourist governorates in Upper Egypt ,The utilization of these sites by converting them into a public museum ,It emphasizes the historical significance and importance of archeological sites like Hermopolice.

Keywords:

Rehabilitation, archaeological site, architecture, museum, Hermopolis, management

Introduction:

Situated around forty kilometers south of Minya, the capital city of Middle Egypt, on the west bank of the Nile, is a location that is not often visited by tourists but holds great archeological significance. [1]

A prominent archaeological site with a variety of buildings from different times is El-Ashmonein (Figure 1). Their mains of Hermopolis, one of the ancient Egyptian metropolitan capitals of the fifteenth century in Upper Egypt, are located between the villages of El-Idara and El-Ashmonein.[2], The Coptic word "Shmoun," which is derived from the Egyptian word "Khemenu" (meaning "City of the Eight"), is the source of its current Arab name. This peculiar term alludes to the Eight, which are four pairs of primordial gods—the feminine element being snake and the male element being frog—who were venerated in this location since the beginning of time.[3]

Figure 1: Re-investigated on the map published by
G. Roeder Hermopolis 1929-1939, Hildesheim, Gebrüder Gerstenberg, 1959
general plan[4]

Actions taken to prevent the deterioration and distortion of historical cities or heritage buildings include preservation operations on archaeological buildings or areas of value, all buildings of interest, specific installations, a distinctly urban environment, or a unique urban fabric. Preservation operations also include any works that work to extend the life of the heritage and the distinctive civilized character of those cities and buildings. It involves taking steps to prevent corrosion and extend the life span of archaeological buildings so that they can continue to serve the purpose for which they were discovered with high efficiency and to preserve their material value even after their useful lives have come to an end.[5]

Advanced skills, computations, and cutting-edge technology all play a part in rehabilitation. This is a very significant job to prevent structures from collapsing due to degradation. The achievement of the building's rehabilitation is contingent upon acquiring knowledge in the domain and keeping up with current developments. It is strongly advised to restore historic structures that exhibit signs of decay in order to prevent failure and preserve lives. [6]. Finding appropriate uses for old buildings that blend in with the historical atmosphere of the old city while maintaining their originality and providing ongoing maintenance is the best

approach to restore and preserve them (figure 2). This is in addition to the requirement that a significant portion of the community understand the significance and necessity of the monument, as well as setting the legislative controls and rights to dispose of public properties and, lastly, providing the necessary financial allocations.[1]

Figure 2: General view of the site of Hermopolis Magna,
with the Hermes temple at the center, and the vegetation covering the site
By Bérangère Redon

Hazard	Impact	Options
Flooding	Waterlogging of remains, exposure and washing away of remains, compounded by the impacts from access/land management	Attenuation (vegetation and nature-based solutions to reduce rate of flow and level of flow affecting site), hard attenuation/diversion (intervening through groundworks and/or civil engineering to divert water away from the affected site), rescue archaeology and preservation by record, potential to target excavation at worst affected areas likely to succumb to repeat events, look to reduce or segment access during wetter months
Drought	Drying out of remains including loss (over time) of organic material and definition of remains	Coring and sampling to investigate archaeological potential and identify hotspots for remains of significance, excavation and preservation by record, indirect impacts of adaptation strategies to retain groundwater (e.g. blocking land drains and potential periods of wetting and drought for remains which may accelerate deterioration)
Heat	Wildfire causing charring of remains from intense heat and fire above ground	Fire breaks in the landscape, avoid keeping fuel stores close to archaeologically sensitive sites, ban disposable BBQs from sites, ban hot works from sites during dry weather (e.g. no hot works are permitted at National Trust places at any time) and plan and enact awareness campaign during times of heightened risk to reduce human causes
Storm damage	Erosion, scarring of surfaces that lead to deeper erosion and exposure of remains, loss of ground protection	Reactive maintenance whereby erosion and scarring are simply repaired quickly to avoid deeper erosion exposing remains, look at investing in geo-textiles and sward changes through land management to build resilience into ground cover, ensure cover crops are in rotation and avoid fallow ground, if appropriate, construct earthwork runnels to divert flows away from sensitive areas
Coastal erosion/ landslide/ cliff fall	Loss or partial loss of features and sites, exposure of remains	Rescue archaeology, preservation by record, recovery of significant archaeological remains for display/ archive, opportunities for community engagement and coping with loss through cultural interventions as well as practical management pathways (options and thresholds agreed to determine at what point sites should be addressed through rescue archaeology). At some sites maintenance of coastal defences may still be appropriate, as well as options for nature based solutions such as salt marsh restoration.
Prolonged rainfall	Waterlogging and exposure of remains	Erosion repair, investigate drainage options, improve rainwater capture, storage and drainage of site (including underground storage potential and diversion of rainwater ingress across the site), geophysical survey where remains are exposed, excavation if appropriate

Table1: Risks that heritage sites are not exposed to — hazards, impacts and options
(Climate Change Adaptation Guidance— Archaeology & Landscape- Buried Archaeological Remains- p.4)

1. DESCRIPTION OF THE AREA

The Minia Governorate is referred to as the "Bride of Upper Egypt" (also El Minia or El Menya). It boasts a sizable number of archeological structures that span Egypt's entire historical history. In addition to being a sufficient documentation of the Pharaonic, Roman, Greek, Coptic, and Islamic monuments, Minia Governorate is regarded as a museum and a timeless record of all historical eras that traveled through Egypt. The unique position of Minia Governorate between the Upper and Lower Egypt is well-known.[7], The Thoth temple, Roman temples, and the Basilica church are among the ancient temples that can be found at the El-Ashmonein archaeological site (Figure 3). El-Ashmonein is a significant archaeological site that has a variety of buildings from different eras. The hare, or mains of Hermopolis, one of the ancient Egyptian metropolises capitals of the fifteenth century in Upper Egypt, are located between the villages of El-Idara and El-Ashmonein. The structures inside this archeological site are vulnerable to various forms of harm and devastation. Numerous geotechnical and geoenvironmental issues plague the area's surviving buildings and granite free-standing columns.[2]

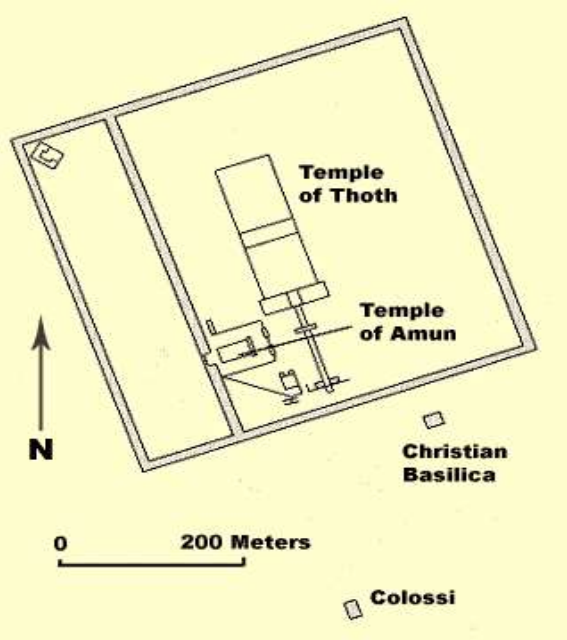
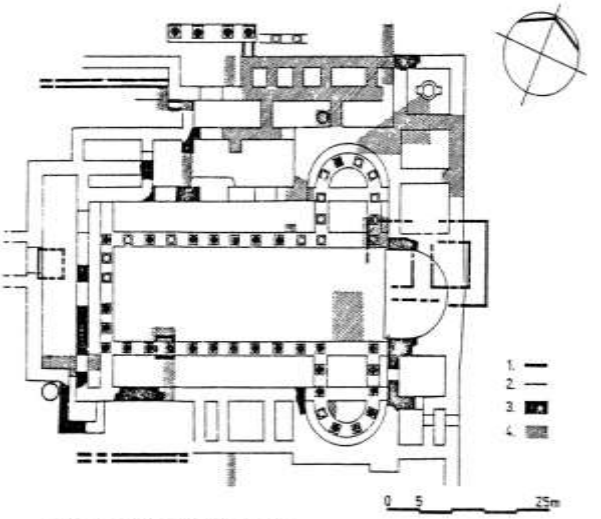


Figure 3: Plan of Archaeological Hermopolis area



The Basilica of Ashmunein.
1 – outline of the Hellenistic remains, 2 – outline of the Basilica's foundations, 3 – remains of the basilica walls and columns, 4 – trial pits and newly excavated areas.

Figure 4: Basilica of Ashmunien[8]

2. CONDITIONS & ASSUMPTIONS

Because precise and comprehensive digital documentation is a requirement for additional analysis and interpretation of artifacts and archaeological regions, it is crucial for archaeological

research to record, document, and survey items and locations effectively. The so-called "direct survey" is one kind of archaeological documentation that uses a caliper or tape measure to measure items or excavation units in direct contact. This kind of survey is very time-consuming and inaccurate. The second type involves indirect techniques, such as using total stations, the Global Navigation Satellite System (GNSS), and 3D optical instruments. These techniques have a number of benefits over direct acquisition techniques, including: a much shorter survey time and higher accuracy; no need for contact measurements, which prevents potential damage to archaeological objects; and the recent development of a wide range of affordable sensors and processing algorithms.[9]

Researchers in the building rehabilitation track focus on:

In the framework of global concerns, heritage preservation is a vital and basic matter. It is a glaring example of how civilizations advance and the source of culture and architectural identity for succeeding centuries. In many nations, especially in recent decades, the architectural style of historic structures has been distorted as a result of improper conservation methods and other circumstances. In addition to examining and elucidating the objectives of conservation, the paper primarily elucidates the mechanisms associated with the notion of the conservation process and the manner in which it is developed and assessed. By using this strategy, it will be possible to preserve the style and unique qualities of heritage buildings with the right treatments. [10]

2.1. Building condition assessments (building envelope, materials deterioration, and structural integrity)

It is important to take these Procedures:

- Determine every item, location, event, and building inside an archeological site.
- Evaluate the importance of the archeological discoveries.
- Using a consistent set of conventions, describe how the proposed development would affect these archaeological remains.
- Provide appropriate countermeasures to reduce potential harm to the archaeological discoveries.
- Examine the relevant legal requirements.

Every identified site, item, characteristic, and construction is recorded in accordance with the basic requirements that are acknowledged by the archeological community. The Global Positioning System (GPS) is used to determine each locality's coordinates. To make it easier to identify each locality, the information is added to the description.[11], Extensive experience demonstrates that the crucial initial stage in this procedure is the evaluation of cultural importance or worth. Although it might seem apparent, failing to do this is a big part of bad conservation planning.[12]

Generally speaking, the foundation of heritage management is inventory and documentation. Documents and records are gathered in inventories to help heritage experts understand what has to be preserved, where it is, and why. Users can manage and analyze heritage data via well-known heritage inventory systems, which include searchable data on the location, attributes, and state of heritage places. In addition to enhancing knowledge of cultural heritage sites, a thorough inventory is necessary for heritage interpretation, management, conservation, and preservation.[13]

2.2. Designing monitoring strategies and implementing effective rehabilitation mitigation strategies for building conservation.

We must first follow these steps:

Survey (inspection and documentation of heritage, it's historical setting, physical and cultural environment).

- Definition (a critical-historical definition and evaluation of the legacy resource's importance in relation to its context and pertinent cultural, social, and economic factors)[14], We must take into account matters pertaining to the creation of practical inventory and recording systems, as well as the preservation and utility of records and other data. Effective historical conservation starts with a useable and accurate database. It is important to note that this kind of database needs to be flexible and adaptable, integrated with other systems, and made to fulfill the demands of users.[12]
- Analysis (scientific methods applied to the resource's investigation, physical consistency, substance, structure, risks, vulnerability, and spiritual significance diagnosed).

- Planning and execution (both short- and long-term programs and plans for change management and conservation; monitoring, routine inspections, cyclical maintenance, and environmental control) [14]

3. Systems-based techniques are used, including:

3.1.1. Graphic representation, modeling, and analysis (to identify types of deterioration, determination of load paths, collapse through stability or strength)

Compiling intricate three-dimensional models of archeological sites is crucial for both documentation and restoration needs. [15], An edited volume that addresses the evolving and expanding importance of digital technologies in all facets of archaeology and asset management is called Digital Archaeology. This book challenges the conventional wisdom that computers are only methodological tools by examining the broad potential of IT across the field and taking into account how they may impact the very character of archaeological research. [16], For instance, 3D scanning or photography, along with CAD, 3D computer graphics, and Virtual Reality (VR) software, can be used to build a digitally restored and reconstructed 3D model. When one considers that the model is always easily accessible for precise measurements, as well as for close inspection and analysis on a computer, even when it is located distant from the location of discovery or a museum storehouse, one may appreciate the significance of this scientific contribution. Furthermore, the 3D model has not been altered or destroyed; rather, it is an electronically preserved place, object, or monument.[17]

Among these technical innovations that have demonstrated application to archaeology and aim to introduce science into this humanities subject are the 3D recording, visualization, representation, and reconstruction of archaeological items, monuments, and sites (Figure 5). Relevant applications include 3D GIS, image- or range-based recording, and virtual 3D modeling. They can be carried out with a variety of hardware—less complex or more complex—and software—commercial or open-source. They can also cost a very wide range of money. The resulting 3D digital model is available in a variety of formats and sizes, allowing experts, nonexperts, and the general public to use it for a variety of purposes and across a range of digital platforms.[18]

Figure 5: Heritages digitally reconstructed using image- or range-based modeling techniques for digital documentation, conservation, restoration, educational, and visualization purposes[19]

3.1.2. Geometric considerations

One of the primary purposes of remote sensing data collecting in archaeological research should be archaeological interpretative mapping. Using these data, interpretive mapping is the process of producing more in-depth archaeological knowledge and information. It is frequently aided by analytical methods like statistical inference or comparison with historical sources. Archaeological interpretative mapping of georeferenced and orthorectified remote sensing products generally follows the same methodology, regardless of the data source: Using a geographic information system (GIS) program, the picture is shown, and dots, lines, and polygons are drawn at and around significant archaeological sites to interpret it.[20], There is no more need to justify the value of geophysical surveys for archaeology because most archaeological sites require their usage as a fundamental component of any comprehensive strategy (Figure 6). The geophysical survey offers new and intriguing research opportunities beyond the geophysical map's utility in determining the location of future excavations, especially in the field of spatial analysis of ancient sites.[21]

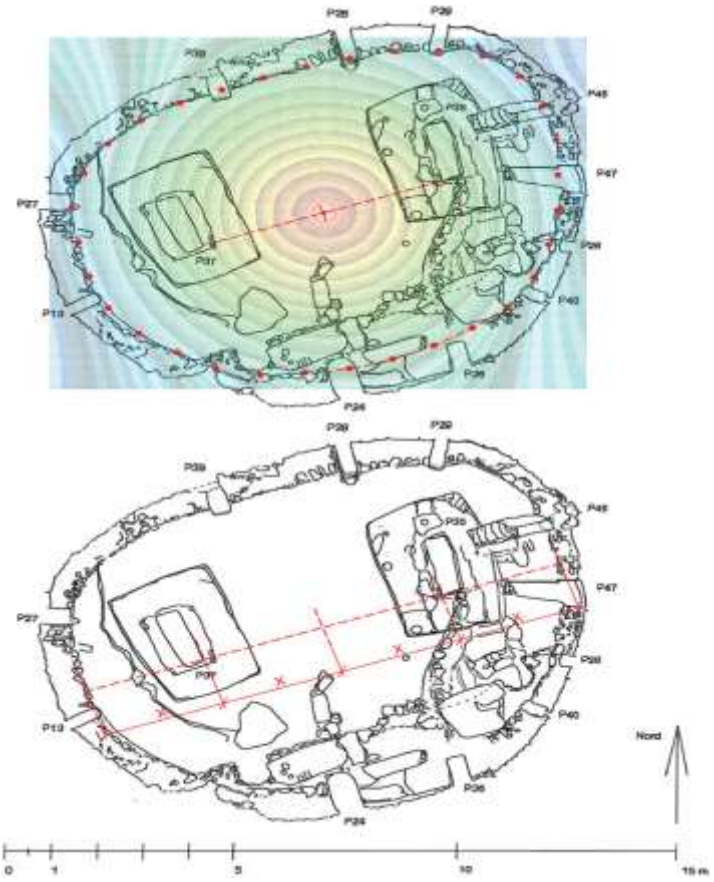


Figure 6:
Architectural formal analysis: Phase A. (Top) Identification of a geometric and statistic center point based on the curvature of the inner peripheral wall: visualization of the calculation. Note the red dots marking 32 points along the inner face of the wall and the resulting center point. (Bottom) The central pillars and peripheral wall are equidistant from each other along the main axis. (Drawing superimposed over the detailed plan.
Redrawn from Piesker (2014)[22]

4. The role of open-air museums outdoors

There are dozens of different types and statuses of outdoor museums today. "Scientific collections in the open air of various types of structures, which as constructional and functional entities, illustrate settlement patterns, dwellings, economy and technology" is how the Association of European Open-Air Museums described open-air museums. Create a model of the actual location with its historic structures to use as a model for developing museums. The second, and most popular, method involves enclosing the presentation function within historic structures and metropolitan regions.[23]

What are our archaeological open-air museums and how can and should they be used?

- a reconstruction
- an experiment
- an educational concept
- a museum visitor attraction
- a gathering place for enthusiasts and reenactors

• or a free mix of the above? The exhibits of traditional museums and the real buildings of open-air museums can be strengthened educationally by the archaeological reconstructions, in contrast to open-air museums that bring farms and other buildings from across the nation to create a miniature version of the world. By recreating the buildings in full scale, the reconstruction itself adds knowledge that was previously lacking to the summaries and speculative buildings created on the drawing board. These experiments have objectives and purposes of their own[24]

The majority of outdoor museums were founded to protect and showcase a potentially dangerous facet of local or national culture, as well as to foster a feeling of accomplishment and identity. [25], The notion of establishing museums as a means of revitalizing non-material values Anthropological (Open) Museums allow for the exhibition of that legacy in order to guarantee cultural diversity, community involvement, and support for urban development. In addition to the aesthetic and symbolic dimensions, the levels of cultural expression in museums have grown and become more evident in areas such as economic, cultural, urban memory, and cultural planning.[26]

4.1.1. The history of open-air museums :

The concept of creating expansive royal gardens and parks gained a lot of traction in England throughout the 18th century. Gardens have gradually moved away from traditional geometric patterns and toward more naturally inspired architecture. These buildings' primary message was one of natural adoration and holiness. Small instances of old and historic structures can be found all over the world, including dwellings and idealized peasant farms, as well as pools and springs. It was determined by the French nobles in the latter part of the eighteenth century to create the natural garden, sometimes known as the English garden, in the expansive parks of their palaces. Its goal was to provide lords and nobles with the opportunity to witness idealized peasant life.[27]

4.1.2. Rehabilitate and management of archaeological areas as an open-air museum

These locations are extremely significant and have genuine cultural worth because some are still in use today and others are popular tourist destinations that serve as international museums. However, some archeological sites are destroyed or eroded as a result of local or

foreign government and corporate organizations' carelessness and negligence. Because of this, it can be challenging or even impossible for tourists or even locals to visit these locations.[28], Risks in site management are ever-changing. As such, the idea of preventive conservation in archaeology is not the same as it is in the realm of museums. Preventive conservation for archeological sites, like in museums, is a sophisticated, adaptable, and flexible method of continuously managing threats. [29]

A plan has been established to create an open museum that may be implemented in the suggested regions in a manner that supports the conservation of energy, resources, and the environment while elevating cultural values. Concept and design determinants for the proposal: (Figure 7)

1. Knowing the main entrance from the moment you arrive at the museum The project's main component is the area or cultural component.
2. Constructing a plaza or leisure area that connects the project's majority of its components
3. The cultural area is positioned near the project's entrance and is easily visible since it connects to the entertainment area.
4. There must be places to sit and relax in the historical zone.
5. Seating and relaxation spaces must be included in the historical zone.
6. All project components should provide simple access to and proximity to commercial service areas, such as a food court and children's zone, from the entrance.
7. To promote trade and tourist, blazers and commercial stores have to be dispersed by the project's movement scenario.
8. Distributed garages to accommodate every person anticipated to arrive at the location throughout the day [30]

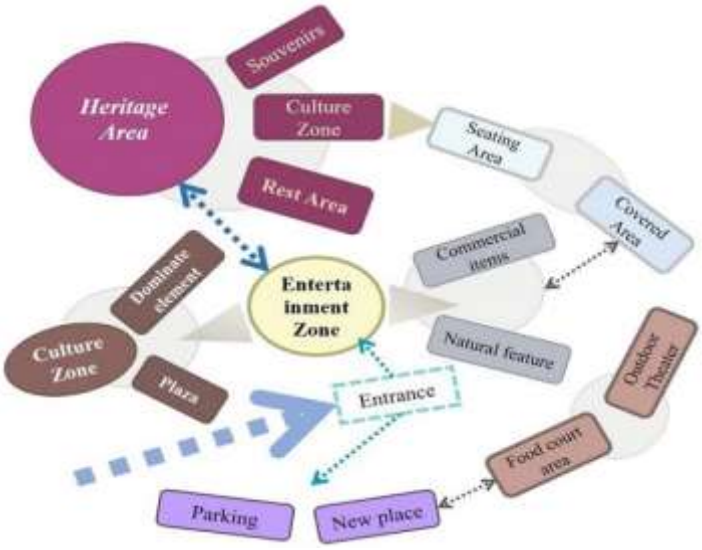


Figure 7: Suggested open-air museum functional diagram
By Walaa Hussein Hussein Hanafi(2022)

5. Proposed study

As per the international definition, a museum is characterized as a permanent, non-profit organization that works to promote society and its advancement. It is accessible to the public and gathers, preserves, studies, shares, and displays both tangible and intangible proof of people and their surroundings for the purposes of research, education, and pleasure.[31]

The goal of this study is to restore the archaeological Ashmounin and transform it into an outdoor museum by a number of actions, such as the following procedures:

- Correcting, photographing, photogrammetrically measuring, and precisely delineating the boundaries of the archeological site from the outside (Figure 8)

Figure 8: In the red shape shown (El-Ashmonein) the archaeological area

- Installing a stainless steel fence around the perimeter to keep anyone from entering at random (Figure 9,10)

Figure 9: An imaginary form of the fences on-site

Figure 10: Design of the fence with 3D Max program (By researcher)

- Building with entrance gates that have the character of the place (Archarological character) (Figure 11,12)

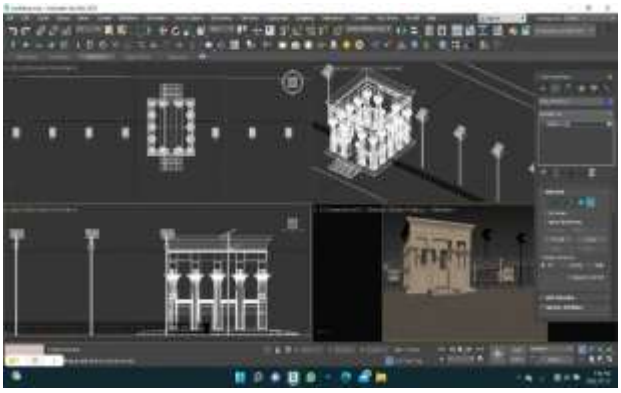


Figure 11,12: An imaginary drawing of the entrance gates fence with 3D Max program (By researcher)

- Installing lighting poles around the area and relying on solar energy to provide clean electricity (Figure 13)

Figure 13:Designing lighting poles around the area relying on solar energy

- Installing rain drains around the area to get rid of excess water in the rainy season (Figure 14)

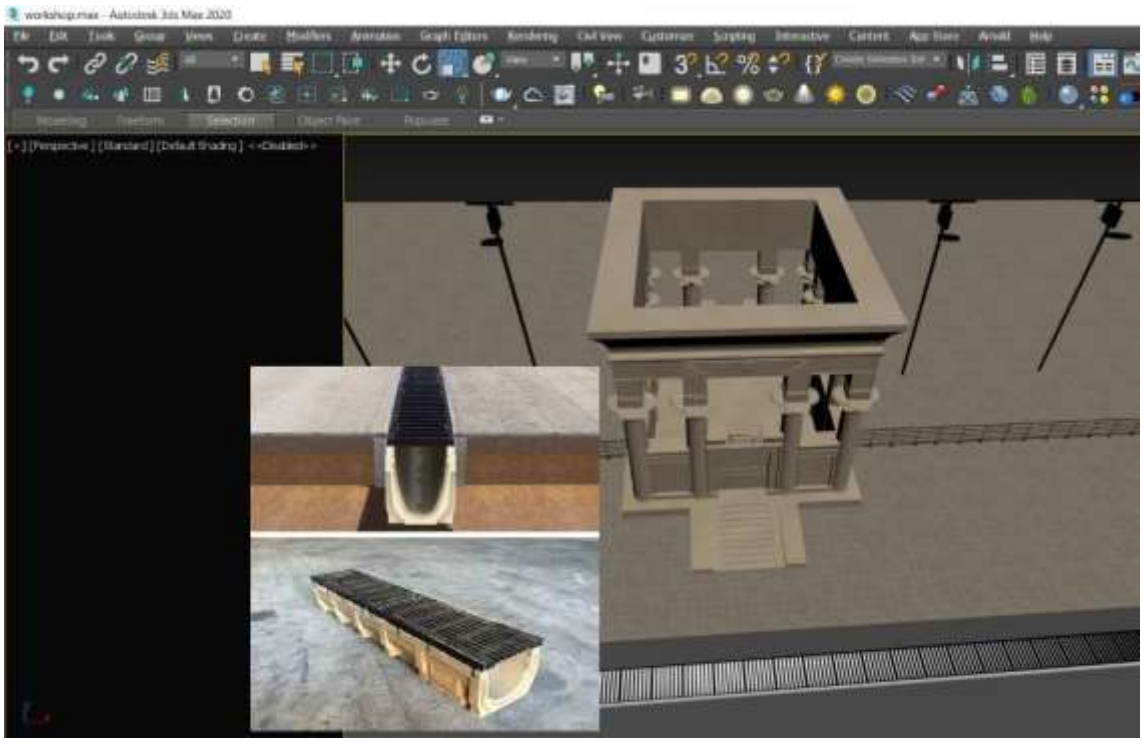


Figure 14: Design of rain drains around the area (By researcher)

- Attention to removing harmful weeds in the archaeological area
- Interested in creating multilingual guide boards explaining the topics of the archeological area using display screens placed inside the gates

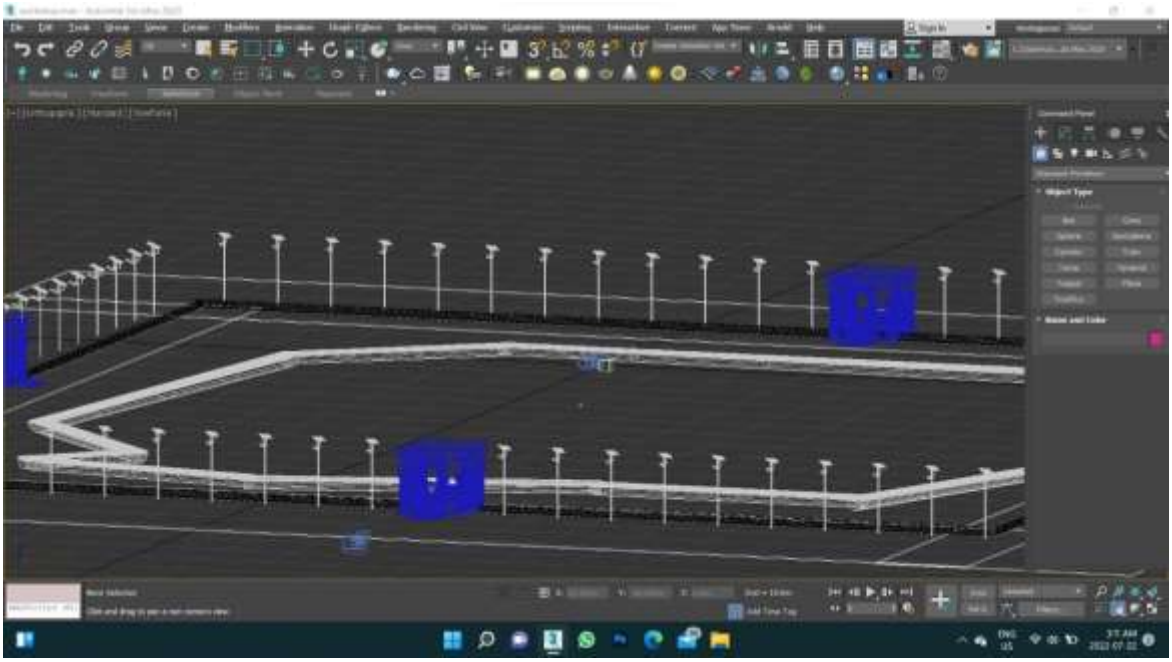


Figure15: A working form for the archaeological area

6. CONCLUSIONS AND RECOMMENDATIONS

- Raising the practical value of the functionally neglected archaeological buildings and providing funds for their conservation and restoration.
- Preserving the original functions of the archaeological buildings in use, so that the historical area does not lose its value(Hermopolice)
- Removal of negative effects and encroachments on the archaeological site uncompromising
- Continuously work to remove weeds and harmful plants in the archaeological area
- Handling each archaeological building by its condition and its need for conservation, restoration, and protection.
- Attention to the disposal of rain through rain drains
- Visual enhancement of the archaeological buildings and surrounding archaeological sites with protective walls.
- Providing the archaeological area with appropriate lighting poles
- Controlling building activities in areas surrounding archaeological sites.

- Preserving the privacy of residential areas, their social activities, customs, traditions, and local culture by refraining from providing them with tourist services.
- Attention to design appropriate entrances that have the character of the place to organize the entry of visitors to the archaeological area
- Preserving economic activities and abstaining from replacing them with tourist services

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