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CONSERVATION PLAN FOR ABILA ARCHAEOLOGICAL SITE – NORTHERN JORDAN

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ABSTRACT

In order to prepare a conservation plan for Abila archaeological site, deterioration forms and factors at the site were documented. Natural factors such as earthquakes, water and salt crystallization, as well as human factors such as negligence and improper conservation are thought to be the main factors leading to the destruction of the site. Previous conservation works at the site were also discussed. In addition to the preventive measures, other interventive conservation measures should be adopted; such as: cleaning, restoration, consolidation and reconstruction of some archaeological features.

KEYWORDS: Jordan, Abila, Decapolis, Umm el-Amad, value analysis, conditions assessment, deterioration forms and factors, limestone, basalt, mortar, plaster, preventive and interventive conservation.

INTRODUCTION

Abila is located at almost the northern end of Jordan, 13 kilometers north of Irbid. Geographically it is on the east site of the southern end of the Sea of Galilee (fig. 1). Owing to the fact that Abila is one of the famous Greeco-Roman Decapolis league, it is one of the most important archaeological sites in northern Jordan. Despite this fact, the site is almost completely neglected.

Fig. 1 Map of Jordan indicating the location of Abila

The depletion of this important site can only be stopped or retarded by the application of a thorough conservation and management plan. Such a plan can also transform this site into a tourist destination, capitalizing on the natural and cultural richness and diversity of the site. The site has been suffering a great deal of deterioration due to a combination of natural and human factors; it is indeed under the imminent threat of damage and destruction.

Negligence and misuse aggravate the situation. Consequently, an immediate intervention to protect the site and prevent further destruction should be adopted. Otherwise, this irreplaceable archaeological site will be completely destroyed. Preparation of a thorough conservation plan, which this article aims at, is the first step for safeguarding Abila.

ARCHAEOLOGICAL BACKGROUND

Abila of the Decapolis is divided into several distinct "Areas," which comprise the modern archaeological site. These Areas are distinguished by their location and special architectural surface features (fig. 2). Abila is thought to be a member of a confederation or a league of autonomous Greco-Roman cities called Decapolis, which means ten cities in Greek. According to the archaeological discoveries in Abila, the history of human occupation went through Bronze Age, Iron Age, Hellenistic Period, Roman Period and Umayyad Period. It can be traced back to 3000 BC.

Abila has been urbanized continuously by several generations and civilizations in the past 5000 years. It was revealed that the city has been abandoned for almost 1500 years, A period during which Abila was lying under the land where the Jordanian farmers cultivated and grazed their animals.

There was a well-connected road system linking Abila with the other Decapolis cities to the north, south and west-southwest, which testifies that Abila had well-established infrastructure and a wide-ranging network of commerce and economic inter-city and inter-district trade (Fuller, 1985).

Within the city itself there are clear remains of a major east-west Documanos, the Documanos proceeded west across the Roman bridge. A branch of the Documanos

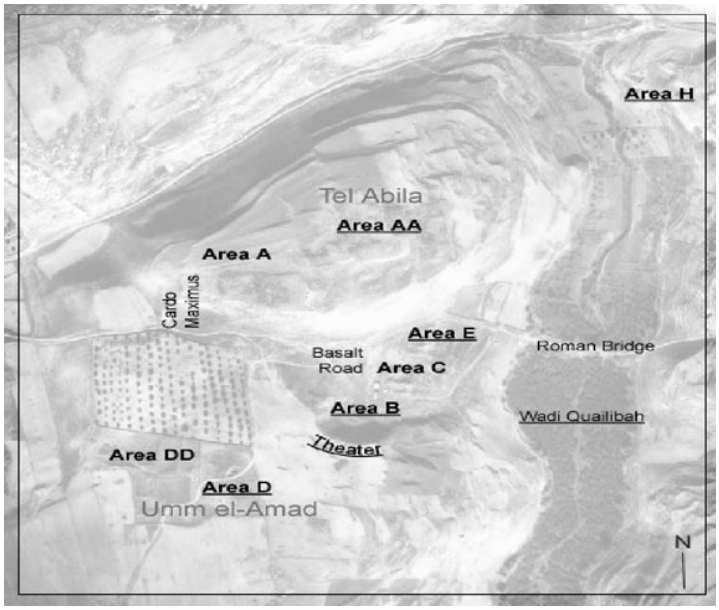

Fig. 2. Main archaeological features at Abila.

extended south, just to the west of the roman bridge striking the east of a large basilica of Umm El-Amad. Beyond the basilica this south Documanos ran past the vaults of the bath Nymphaeum complex and the turned west to run just below small charge located on small rise east of the theater cave. Abila's cultural richness and diversity can be seen in the archaeological remains of its villas, basilica, theaters, Odeon, baths as well as tombs. The site had at least five basilicas and three water tunnels. On the north edge of this sector is located the cave of the supposed theater (Mare, 1984). To the west of the theater and north of the basilica ruins is an olive orchard. On the top of Tell Abila in its south sector are ruins of what have been designated a "public buildings" and a wall on the northern slope of Tell Abila. The cemetery area for the site of Abila extends along the slopes of Wadi Qweilbeh to the south of Khirbet Umm El-Amad. The Cardo Maximus extends south onto Umm El-Amad. A basalt street to the southeast of the site ran along the north edge of the Umayyad buildings down the theater caves and extended over an earlier Roman limestone street (Mare, 1992).

Abila is also famous for its tombs full of frescoes. Approximately 25 caves each with 15-25 tombs were found. Excavations showed that a mosque was built during the Islamic rule and a palace during the Ummayad period (Shunnaq, 2005)

It is believed that there are many other structural elements at the site. Excavations continue to reveal more about their significance and relationship with the other features at the site.

VALUES AND SIGNIFICANCES OF THE SITE

The values of Abila archaeological site can be separated into two main categories, socio-cultural and economic. This is true

concerning the conservation and development planning for the site, but another way based on the stakeholder analysis is also getting popular. The values are distinguished according to the motives of stakeholders, which decide their attitudes to the site. Historic and artistic, education and research values are core values defined by professionals in a more academic way. Social or civic, spiritual or religious, symbolic or identity, economic values are related to the people who have emotional associations or physical, material relations with the site, practically the latter values, which are relatively ignored in the traditional conservation management, deserve more sufficient consideration in the significance assessment (Al-Saad, 2005).

CONSERVATION INTERVENTION:

Conservation intervention for Abila archaeological site should include the following measures: condition assessment, cleaning, consolidation, restoration, reconstruction and removal of wrong conservation materials.

CONDITIONS ASSESSMENT

The first step for preparation of a conservation plan for Abila or any other archaeological site is to study and analyze the present situation of that site.

Wrong previous conservation, cracking of columns, erosion of mortar joints, dampness penetration through the foundation of the walls, and instability of the foundation, are the main symptoms of deterioration at the site.

It must be emphasized here that the site is not fully excavated, and even the excavated part is suffering from negligence which enhances the action of the different factors of deterioration.

The main building material at the site is stone; it will in time revert to the material from which it was formed. There are various factors, which fasten its decomposition, which can basically be broken down into man-made and natural causes.

The stone structures at Abila have withstood the attack of natural weathering agents for centuries. Yet during the last few decades many of these structures have been observed to undergo accelerated decay.

Generally, the weathering of monumental stone relics in the open air is dependent on a number of factors, such as:

I. The age of the monument,
II. Climatic and microclimatic conditions which depend on the orientation of the monument in relation to the sun radiation, wind, rainfall and running water,
III. The geological and lithological nature of the stone,
IV. The grade of material and workmanship,
V. The aggressiveness of the environment, like atmospheric acidity, both natural and man made, or salt spray (Fielden, 1982; Pagliari, 1989; Van Grieken et al., 1989 and Brunjail et al., 1993).

Cracking, soiling, blackening, loss of strength, stiffness, fungal stain, harmful growth of plants, erosion of mortar plaster all can be documented at the site.

The presence of some archaeological features such as Umm El- Amad church on Tell Umm El- Amad makes it easy to be exposed to the effect of wind for long term, and the alveolar weathering can be seen clearly over the surface of the church columns.

It is believed that the A.D. 748 earthquake was the main cause for the destruction of the site, and the cracking of columns either vertical or diagonal are

indications to the structural instability caused by this earthquake (Samarah, 2005). The location of the site over Ein Gweilbeh makes the building materials there susceptible to all damages connected with water, taking into consideration that moisture is associated with the majority of weathering mechanisms. Without water there would be no chemical reaction of stone constituents, soluble salts would not be transported and there would be no crystallization and recrystallization, airborne atmospheric pollutants have no chance to be dissolved and transported deep into the stone, so they would not remain in contact with stone constituents for a long time and the attack on stone would be reduced (Plendreith, 1979; Rossi-Manaresi, 1982; Amoroso and Fassina, 1983; Nishiura, 1986; Heiman, 1988; Hammer, 1995; Al-Naddaf, 2002).

Water erosion, caused by running water, plays a very crucial role in the weathering of the stone structures in Abila.

The most common deterioration forms of the building stones of Abila as a result of the action of salts include powdering, blistering of the surface and structural decay often associated with the presence of salt efflorescence.

Portland cement, which have been used in the conservation works of Umm El Amad basilica and some other structures at Abila (fig. 3), is a very important source of salt which really began to destroy the original stone and columns of the site. (A. Charola, and Herodotus, 2000)

The study area suffers from a long period of solar radiation and therefore from temperature fluctuations that leads to expansion (during the day) and contraction (during the night) cycles. Abila archaeological site is mainly built of limestone which expands $25x10^{-6}$ mm / ºC parallel to C- axis and contracts $4.9x10^{-6}$ mm / ºC normal to the same axis in a temperature range between 18 and 50 ºC. (Paradise, 1999). Therefore, it can be concluded that the site is highly subjected to this type of damage. Due to the availability of sufficient humidity, spotty staining, hard encrustations and blackening of the stone can be seen on the stones of Abila in sheltered areas, where microorganisms can grow. In addition to microorganisms, green plants can be seen everywhere at the site.

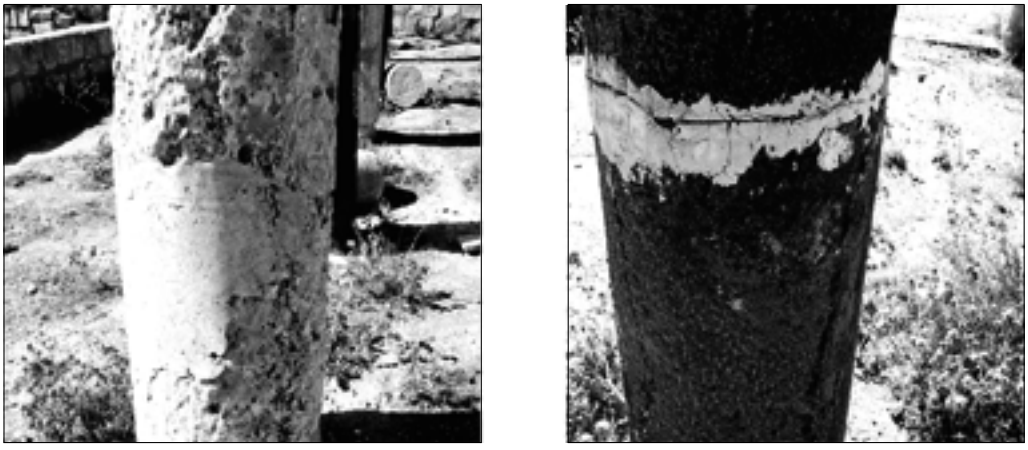

Figure 3:The use of Portland cement to restore limestone and basalt columns at Abila.

Animals can damage buildings by urinating, defecating and overgrazing by goats, which can damage the site by climbing everywhere. Mice are the most spread animals at the site; they can destroy the site by digging between the stones and breaking down all the binding materials.

Negligence and ignorance coupled with vandalism and fires are possibly major causes of destruction by man. Lack of public awareness of heritage is the most important and influential factor in the destruction of Abila archaeological site.

Rubbish throwing inside the historical buildings by visitors is very obvious at the site. Plaster are particularly vulnerable to vibration, wall paneling is also vulnerable as loose material may wedge behind the paneling and force it outwards.

Open joints due to thermal movement and vibration damage are very common defects that can be detected at the site of Abila.

Assessment of the conservation works at the Site

Some aspects of the conservation work adopted at Abila caused serious problems in terms of their compatibility with the principles of conservation of the archaeological sites, as stated in the international charters of conservation such as Venice Charter, 1964 and Burra Charter, 1978. These aspects can be summarized as follows:

It is clear that the conservation works conducted at the site were not thoroughly planned; they were selective, concentrated on particular features and ignored others.

In general, the used materials are unacceptable and incompatible with the nature of the original building materials; concrete was used in the restoration process, the use of such material will damage the limestone of which the building is made and it disturbs the aesthetic value of the site.

The conservation conducted at the site created a controversial and disharmonic impression; the quality of the reassembly of some of the structure is highly disputable.

Some of the trenches with no archaeological evidences were left open, which distorts the landscape and threat to potential visitors. Moreover, unfriendly techniques that are incompatible with the site like the wire fence were used around the basilica on area D.

The uses of Portland cement are obvious in the previous conservation work of the site, in the columns and in the exterior wall of the site (fig. 3). There are many facts related to the use of cement such as: Portland cement is a magnificent material for modern structures, but it is not designed for use in mortars or plaster on historic buildings because of its defects and side effects on traditional materials, it is an irreversible material, which will damage all historical materials if one tries to remove it.

Portland Cement is stronger than most types of building materials at Abila archaeological site, excluding basalt. Therefore, such cement should not be used on limestone, taking into consideration that conservation materials should be slightly weaker than the object to which it is applied (Horie, 1987). Portland Cement has low porosity that prevents evaporation of water in the pore of building stones which will increase dampness in the internal structure, consequently, its damage will be accelerated. Moreover, Portland Cement is considered to be a potential source for salts, which can be dissolved and transported in the pore of the building stones and activate the whole damage of the buildings.

Examples for wrong conservation and wrong use of the site include also the

insertion of new elements to the site and the wrong restoration of the columns by improper arrangement of the drums. Lack of maintenance and protection of the building materials, which can be attributed to the lack of trained staff with good experiences and skills in technical knowledge in repairing and maintaining historical buildings, is another cause of deterioration which the site suffers from.

Due to adoption of wrong conservation measures, iron bars were used within the exterior walls of the church and between the drums of the columns (fig. 4). Where the routines of building inspections and maintenance have been neglected, these pieces can be easily exposed to all sorts of defects, and by time action it will destroy the stone itself.

Levels of conservation intervention

According to British Columbia Heritage Trust, 2003, heritage conservation work encompasses a range of approaches. These approaches vary according to the extent of the conservation activity involved and the degree of impact on the historical fabric. Accordingly, conservation intervention can be classified into the following levels:

a. Maximum Respect for Historic Fabric, which includes the following actions: Preservation, Stabilization, Consolidation, Restoration and Rehabilitation

b. Moderate Respect for Historic Fabric such as:
Reassembly, Replication, Reconstruction, Moving and Fragmentation

c. Limited Respect for Historic Fabric as: Renovation and Modernization.

For a site like Abila and similar sites, it is safe to say that the first level of intervention is the most important, and must be adopted when possible. Otherwise, the level of the moderate respect for historic fabric may be sometimes be applied, while the level with limited respect for historic fabric should be avoided.

However, the reason for selecting one level of intervention over others depends upon a number of factors such as:

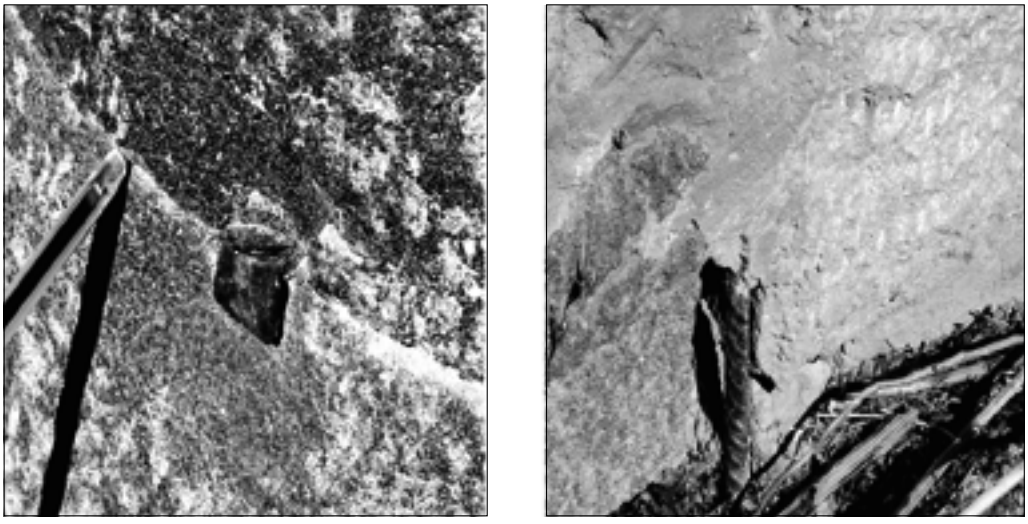

Figure 4: The use of iron pieces for the restoration of the site.

The goals of the conservation projects, which may be only for scientific reasons, in this case the significances of the site must be preserved, which means that only preventive measures are needed to be adopted, and no intervention is needed. The other reason for the conservation of the site may be to make it a tourism attractive site. In this case interventive conservation should be conducted.

Condition of the site.

Availability of financial resources and experts.

We believe that a site such as Abila can be a tourism-attractive site if good conservation measures are adopted. Consequently, different levels of interventive conservation should be taken into consideration this includes: cleaning, consolidation, restoration, reconstruction and removal of wrong conservation materials.

CONCLUSIONS AND RECOMMENDATIONS:

Based on the condition analysis of the site, its values and significances in addition to its future utilization the following conservation measures are recommended. The suggested conservation interventions are a combination of preventive and remedial measures. These can be summarized as follows:

Cleaning: the first action to be conducted in the site is to clean it to remove dirt, higher plants, lichens, ivy …. etc. For this purpose both mechanical and chemical, by using pesticides, should be adopted. However, for determining the method to be used, it is important to test it thoroughly.

Consolidation: due to prevailing deterioration factors affecting the site, some building materials, such as plaster, mortar and limestone, lost their strength and became soft, therefore, consolidants should be applied to reestablish the weakened strength. To determine the specifications of consolidant to be used and the techniques to apply them a series of testing procedures should be devised.

Restoration: Restoration should be based on respect for existing material and on the logical interpretation of all available evidences, so that the place is consistent with its earlier form and meaning. It should only be carried out if the cultural heritage value of the place is recovered or revealed by the process. The restoration process typically involves reassembly and reinstatement and may involve the removal of accretions.

To restore any structure, it is essential to know the original shape of that building and also the original building material must be available. However, whenever these two conditions are fulfilled, restoration work should be conducted. One important archaeological feature in Abila where the original materials are available and the original shape is known is the Basalt Street. We believe that the restoration of such an important feature will contribute to making the site a tourism destination.

Reconstruction: Reconstruction is distinguished from restoration by the introduction of additional materials where loss has occurred. Reconstruction may be appropriate if it is essential to the function or understanding of a place, if sufficient physical and documentary evidence exists to minimize conjecture, and if surviving heritage valued are preserved. Reconstruction should not normally constitute the majority of a place.

In some cases, in Abila, the original design of an archaeological feature may be known but the original building materials

are not available as a result of being reused by the locals. In such a case no restoration can be conducted, instead reconstruction might be necessary. The most important feature which needs to be reconstructed is the Basilica of Umm El-Amad, for the same reason for which the Basalt Street should be restored.

Removal of wrong conservation materials: wrong conservation materials such as Portland cement and iron bars used for the conservation of the monuments at the site should be removed and replaced by other materials which do not negatively affect the building materials. Therefore, ancient mortar should be thoroughly examined, reconstructed and tested to use it as an alternative for the Portland cement. While the iron bars should be replaced by stainless steel ones.

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