

# صيانة وترميم الابنية الأثرية والتراثية

دراسة تطبيقية في مدينة ايله الاسلامية

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## لجنة المناقشة

الدكتور زياد السعد ..... مشرفاً ورئيساً

الاستاذ الدكتور زيدون المحيسن ..... عضواً

الدكتور اكرم الروسان ..... عضواً

## **Abstract**

### **Conservation and preservation of archaeological and historical architectural remains-A case study from the Islamic city of Ayla.**

This study deals with one of the most important issues regarding the cultural heritage: its deterioration and preservation. This study is confined to the study of architectural remains in terms of their deterioration and conservation. The factors that contribute to the deterioration and destruction of architectural remains were thoroughly discussed. Natural and human factors are acting together in depleting these remains. Natural weathering caused by various factors such as humidity, salts, earthquakes lead to the gradual however steady destruction of ancient architectural remains. More drastic damage is being caused by human influence. Sporadic and uncontrolled urban development has caused severe and irreversible damage.

This study aims at analyzing the factors that cause damage and destruction of architectural remains. The ultimate aim is to reach the best approaches and methods that should be adopted to preserve and protect these irreplaceable remains. In order to fulfill the aims of this study one of the most important sites that contains rich architectural remains has been selected to implement this study. The site is called Ayla, a famous Islamic City. Its importance stems from the fact that it is the first city, which was established in Al-Sham states in the early Islamic period. It was built in 650 AD i.e. in the period of caliph Othman bin Affan.

The city has been exposed to constant attack caused by natural and human factors. Being located in area of active tectonic movements, the city was struck by a series of strong and damaging earthquakes that caused a great deal of damage and destruction. Furthermore, the location of the city on the sea shore put the architectural remains of the city under constant attack caused by salt crystallization. Capillary water enters the walls of the building carrying high concentration of soluble salts, mainly chloride. Upon change in humidity and temperature this salt is deposited within the porous structure of the buildings. Re-dissolving and crystallization of the salts put tremendous pressure on the structure, which ultimately lead to its total collapse.

There has been some efforts toward the conservation and preservation of the architectural remains of Ayla. Some of the structural elements were rebuilt using new stone blocks and fixed by using cement mortar. Some of the gaps between existing stone courses were filled with cement in order to strengthen and preserve the structure.

Unfortunately, the conducted conservation and preservation measures result in catastrophic consequences quite obvious when the site is visited. It is quite clear that the wrong conservation methods and materials were used. The restoration works were not executed according to the international standards. The use of cement caused severe damage to the built structures manifested in the extensive scaling and flaking of the built stone and the bonding material.

To know the extent to which the materials of restoration achieved success, a group of laboratory methods were used to test some of these samples. They are X-ray diffraction (XRD), petrology, strength test and titration.

After finishing these processes, important findings were reached. Some of them are that the mortar used in the original process of building the city is the Gypsum mortar. This type is highly affected by water, which causes a weakness element in the building. In addition, the cement used in the restoration process has not been the suitable material for this process, as it has a high content of salt, it is also harder than the stone used in

the construction process. This forms a layer which later on flakes away from the material restored. Stone used in the process of restoration was not suitable for that purpose as it included a high level of salts and sometimes it is weaker than the original stone.

Therefore, conservation and restoration processes conducted in the city have been an effective reason for increasing the deterioration in its architectural remains.