

Cairo University
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Application Study for The Conservation and Restoration of wooden Ceiling covered with canvas with The Application on The palace of prince Alin Aq El Nasery El Hosammy

in Cairo City

A Thesis submitted for Completion of Requisites of Master Degree in Conservation of Archeology by:

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Summary:

This study deals with the wooden ceiling of the private entrance to the palace of Prince “Alin Aq El Nasery” El Darb al-Ahmar district - the city of Cairo, which dates from between 693 - 1070 A.H.: 1293 - 1669 A.D. from the Mamluk Bahay period. The wood was covered with a color canvas layer, which is uncommon. Deterioration as well as analysis of all components, materials and technology of implementation were identified and a treatment plan for the protection of the roof using the technologies while maintaining the main elements of archaeological application was studied.

Part I - Chapter I - First:

This part of the study deals with important sources, types and qualities of timber used in the ceilings of Mamluk buildings and specifically about the sources of timber during the Bahari Mamluks period which was distinct in architecture and art, in addition to the most important timber species used in Egypt during the historical periods, which was characterized by the presence of two types of local timber and imported types and their names and qualities, colors, uses and specifically the quality of timber. Coniferous wood which was used for the roof on the entrance of the palace of Prince “Alin Aq El Nasery” was common in most of the buildings in the Mamluk period due to value and ease of dealing with it. The composition and color of this type of wood was addressed, in addition to the anatomy of trees and morphology, natural and internal divisions and chemical components of those types of trees, and the characteristics of natural and physical defects of timber.

Part I - Chapter I - II

This part deals with how the wood was prepared for carpentry and the technical implementation of the wooden decorative ceilings during Mamluk Bahary period, the philosophy and aesthetics of Mamluk architecture and the variety in its designs and motifs. The woodworking industry in the Mamluk era included the how timber was transported and processed before its use in the manufacture of the ceiling of Mamluk buildings whether civilian or religious. The ceilings were an essential element of these buildings; therefore it was necessary to study its supplements, different elements and the use of relieving in some parts as a means of decoration, which is a reflection on the creativity of the manufacturer and the artist during that period. The patterns of color coverage used on the ceiling and methods of application achieved the aesthetics of certain Mamluk architecture and decoration and emphasized the harmony in order to achieve unity, a systematic architectural art which aims to use the ceiling to cover the buildings, in addition to being a part a construction and architectural design. It had been used as documentation for the originator's name, attributes and titles and functions like the foundation stone at the entrance of an architectural building.

Part I - Chapter I – III

This part explains the partial system of architecture of the palace of Prince “Alin Aq El Nasery”, including description and architecture of the palace, the only palace remaining from the Mamluk Bahary period, and interpretation of the qualities and titles of originator, as well as the interpretation of the development of the palace with all its components; entrance, decks, rooms, buildings, and service enhancements over the centuries which included various additions and removals.

The technology used for the implementation of the wooden ceiling covered with a layer of colored canvas at the entrance to the palace, was an interesting point of research, because it is as a unique example of this technique in terms of the structural design of the roof block, wood, as well as its details and explains the technique of execution of the layers of the roof from the outside and the inside as they appear with the naked eye and determines the types and patterns of color and finishes used and how it was distributed in the entire flat roof.

Part I - Chapter II - First:

This part explains in detail phases and stages of deterioration of the external layers which were discovered covering the wooden ceiling of the private entrance of the palace of Prince “Alin Aq El Nasery”. Documentation was done from the exterior roof, and was outlined by describing the layers in accordance with the sequence of uncovering the debris beginning with the quality of stone slabs, mortar and layers of the fillers underneath the old insulation. An explanation and detailed aspects of deterioration became clear and it was possible to detect and document the basic structure with all its members of the wooden roof, and the loads that it carried in the past. The wooden beams had two purposes in the past; a structural component for what was to be placed above it and as a support for the canvas layers, coloring and decorations. The condition of the ceiling, whether from the outside or the inside was addressed, examined and characterized. The deterioration of the roof from the inside was due to the effect of loads in the past and the properties of wood core and its consequent structural damage, in addition to physical and chemical damage of wood panels decorated from the outside which had been exposed to erosion and loss, drought, moisture and biological and microbiological attack, as well as loss of ductility due to the loss of large proportions of cellulose interior.

Part I - Chapter II - II:

This part explains in detail phases and stages of deterioration of the interior layers of the canvas, preparation layer, and colors in the ceiling of the entrance of the palace of Prince “Alin Aq El Nasery”. The first stage was the documentation of the damaging factors and deterioration of wood forming the ceiling from inside, which included cupping, warping and cracking of wood fibers, the additions of mineral and the remains of mortar on the surface, damage on the surface as well as secretions of natural resins, presence of accumulations of dirt and the change in color and texture due to thermal decomposition, microbiological decay of wood, and deterioration of the textile layer used to cover the wood from the inside, in addition to the loss in the canvas layers.

Part I - Chapter III - First:

This part discusses the types of tests applied and the methodology of taking samples from the ceiling wood of prince “Alin Aq El Nasery” palace.

Part I - Chapter III - II:

This part discusses the tests, that were applied to the samples taken from the mortar from the upper floors of the roof, testing of timber in terms of biological and microbiological study, which attributed to the loss of cellulose in the timber, assessment of the quality of the cloth "canvas" to determine the nature of the fibers, then tests were carried out on layers of color and patterns of gilding which were found in the ceiling. It was important to differentiate between the original and added layers. Samples were examined using X-ray diffraction, optical light microscopic, SEM and FTIR, and the fungal infection was identified.

Part I - Chapter III - III:

This part dealt with the philosophy of the technique used in the implementation of the entrance to the palace of Prince “Alin Aq El Nasery” through the results of tests and laboratory tests and analytical studies carried out on layers of the ceiling from the inside and outside, it included the debate on the quality of glue fish that had been

used, paraffin wax, which was present in some areas, and the components of ground layer, and the quality of cellulosic fibers, which proved to be of the quality of cotton fiber, in addition to the use of the yellow ochre, the red color of both types of cadmium and iron oxides, blue italic-green and white and black color, golden color of both types.

Part II - Chapter I - First:

The restoration work plan was applied according to the results of the tests that were implemented at the beginning of the ceiling documentation. The backing of the decorated panels of the wooden ceiling from the outside was the starting point of restoration and the upper layers were mechanically cleaned and procedures were scientifically documented.

Part II - Chapter I – II

conservation process was applied after removing the upper layers and the treatments for the recovery of flexibility to the back panel, which was suffering from dryness, was done. That was followed by the installation and connection of the panels that were separated from their positions.

Part II - Chapter I – III

After the calculations and structural study of loads of old the ceiling were completed the development of new designs, which specializes in reducing those loads to nearly 20% of the previous loads were done. Pallets of stainless were fitted with the use of mechanical suspension, as well as the mechanical installation of the new ceiling to protect the archaeological ceiling. That was followed by covering the timbers and the consolidation by using thin wood panels, followed by layers for insulation from heat, humidity, rainfall. These layers consisted of polyethylene, Allika ,isolation sheets and foam insulation in addition to the layer of filler, sand and mortar with the reduction of loads from what formerly covering the ceiling.

Part II - Chapter II - First:

Description of the stages of documentation, with all the elements of the ceiling which was covered with a layer of canvas, coloring layers, all aspects of degradation, was done using photography, sketch drawing or modern computer programs.

Part II - Chapter II - II.

Mechanical cleaning process for various types of deposits was performed on the panels, which were discovered in the layers of rubble. The degree of flaking of the surface and the degree of processing them with access to the agenda for the interpreter of the results of those experiments, as well as the behavior of each of the materials used and their effectiveness, even access to the methodology in use.

Part II - Chapter II – III

Restoration of the wooden stand and employing the methodology for the completion of ceiling of the entrance to the case of the palace of Prince “Alin Aq El Nasery” were an important part in the restoration of historic buildings and the quality of this update and the extent of its application to reach a steady-state, as well as historical documentation had to be achieved.

Part II - Chapter II - IV.

Chemical cleaning of the ceiling layers began according to the initial experiments that were performed on archaeological panels which had been discovered in the layers of rubble and it has been determined a special table the results of these experiments which were then applied to the ceiling in question and determine the response of actual and vulnerability of each degree of color tones of the dyes used in the ceiling and the effectiveness of the materials with each of the red color, whether from cadmium or iron oxides, black ivory, blue italic-green, yellow ochre, the white color of the titanium oxide, and the background, which had lost its color and the wooden support, in addition to the gilding the ceiling.

Part II - Chapter II - V.

Explains the methodology for completing the decorations and writings of the “Alin Aq El Nasery” ceiling with consideration of the wooden cornice rack containing the original text, which was sufficient to apply the theory and methodology of completing the missing different layers, including the pigments, according to heritage requirements, and lastly reaching the stage of isolation.

Sign of Supervisor PH.D :

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