

## Application of Wood in Architectural Structures of Islamic Era in Mazandaran

Narges Alaeibakhsh<sup>1\*</sup>, Mohammad Bahramzadeh<sup>2</sup>, Hamidreza Valipour<sup>3</sup>

<sup>1</sup> M.A. Student in the field of Archeology, Islamic Azad University, Abhar Branch  
<sup>2,3</sup> PhD in Archeology, Assistant Professor in the Department of Archeology, Islamic Azad University, Abhar Branch

*Received: June 10 2013*

*Accepted: July 10 2013*

---

### ABSTRACT

Wood is one of the most natural and most available materials which has been used from a long time ago. History acknowledged the inherent resistance and durability of wood and its compatibility with environment had been proved. The above theory has been demonstrated through the application of wood in historical monuments, most of which are among national honors of every nation. The most prominent characteristic of wooden structures and hence wooden building is their resistance.

In Iran as a country with many forest resources, two architectural systems have always been used for construction. One of them is a system with wooden skeleton and other is based on the application of vault.

In north of Iran, a considerable percent of construction includes wooden structures which could provide an appropriate experience for current engineers and experts.

The present paper aims to identify and study wooden applications in Islamic architectural structures in Mazandaran, and to introduce physical elements and components through going to the location, field work and library studies.

**KEYWORDS:** application of wood, roof skeleton, wooden structures, architecture.

---

### INTRODUCTION

Architecture is one of the important branches of art and civilization. Various human groups have been interested in architecture and they always tried to develop and evolve it. Iranian precious architectural works introducing Iranian civilization are the result of continuous efforts of the craftsmen who enthusiastically used their innovation, faith and belief to develop architecture art as much as possible, particularly in Islamic era.

Archeological studies and research showed that Iranian architecture could be traced back to around 7<sup>th</sup> millennium B.C. From then up to now this art has been developed in respect to various issues, especially religious ones.

Iranian architecture has features which are much more valuable than those of other countries. These features include appropriate design, detailed calculations, correct form for cover, meeting scientific and technical matters in the building, high porches, tall columns, and the last but not the least various adornments; although they seem so simple, each of these features by itself represent the glory of Iranian architecture.

Due to restrictive resources and indefinite needs, human beings have increasingly interested in appropriate techniques in order to apply noble patterns and initiative thinking and hence utilize their distinctive abilities for constructing durable buildings. Forest woods are one of the resources which not only had been used by people from a long time ago but also its application is growing today. This natural blessing has always been used by human beings for many applications, the most important of which is structural application.

This research aimed to identify and study application of wood in architectural structures of Islamic era in Mazandaran. The study starts with a summary of this province geography in Iran and proceeds to introduce pictorially wooden applications in architectural buildings and finally it concludes.

### Statement of the Problem

Structural elements in architecture as underlying base for the building are of prime importance. Elements of Islamic architecture of Iran such as porch, dome, minaret, etc. have been incorporated with various materials. Resistance degree of the components of each structure is directly related to how different construction materials such as mortar, brick, mud-brick and wood are combined together. Due to its elasticity, resistance against propulsive, bending and rotating forces and its frequency in every climate, wood has been applied in Iran from ancient times. Islamic architecture of Mazandaran introduced different kinds of wood application in two categories of building, i.e. religious and non-religious. This research presented and explained some of the structural applications of wood in buildings of Islamic era in Mazandaran.

---

\*Corresponding Author: Narges Alaeibakhsh, M.A. Student in the field of Archeology, Islamic Azad University, Abhar Branch. M\_N\_Alalae@yahoo.com



Figure1.1. Representation of geographical location of Mazandaran Province in Iran

Wood had frequently used in the construction of Islamic era buildings, especially in Mazndaran, because it has many large forests. The applications of wood in Mazandaran in Islamic era are presented in following pictures.

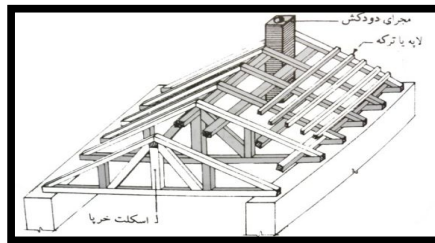


Figure2.1. Detailed execution of wooden skeleton of roof in Madani's House from Qajar Period, Amol, Mazandaran, Iran.



Figure2.2. The roof of Madani's House from Qajar Period which is constructed of wood, Amol, Mazandaran, Iran.

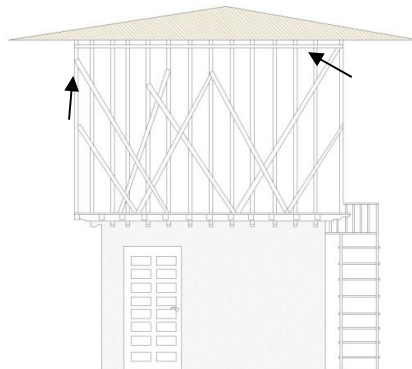


Figure3.1. South façade of Pashakala Hall (Saghatalar) in Amol where application of wood in the main body of hall in upper floor is completely evident.



Figure2.3. Wooden beam in horseshoe ports of Madani's House from Qajar Period, Amol, Mazandaran, Iran.



Figure2.4. Flooring of upper floor in Madani's House from Qajar Period, Amol, Mazandaran, Iran.

### **Minarets of Mosques**

Minaret literally means a place for light and fire and indeed it is a tall and narrow structure which have usually been constructed next to mosques and holy shrines to recite izan or next to the roads, mosques , etc. as a guide post. Minaret in mosque means the light position (Kiani, 2008:322).



Figure2.5. Minaret of Imam Hassan Askari's mosque where top of the minaret is a wooden structure, Amol, Mazandaran, Iran.



Figure2.6. Entrance of a private alley in an old neighborhood in which underlying structures of the roof are made of wood, Babol, Mazandaran, Iran.

There are various kinds of application of wooden structures in the chief (Friday) Mosque of Babol. This mosque is traced back to the ruling period of Mohammad Shah Qajar, in 1873.



Figure2.7. A wooden beam which is crossed from inside the wall of staircase and connected to minarets and roof.



Figure2.8. Application of wood between the rows of bricks and the end part under the roof of staircase connecting to the roof area.



Figure2.9. Double wooden beams in the end part of staircase roof which are connected to the roof area.



Figure2.10. Application of planks in staircase roof connected to the roof area.



Figure2.11. Application of wooden ladders for establishing the roof on the top of mosque entrance.



Figure2.12. Application of wood in staircase connecting to the roof area



Figure2.13. Application of wood in the end of bricklaying of stairs



Figure2.14. Top of the minaret above the entrance of mosque which is made of wood.



Figure2.15. A sitting place for the old in Hami passage with wooden structure which is traced back to 200 years ago, Sari, Mazandaran, Iran.





Figure2.16. A sitting place for the old in Hami passage where columns are based on wood, Sari, Mazandaran, Iran.



Figure2.17. Application of wood between roof and wall as well as between two floors in Kalbadiha's house, Sari, Mazandaran, Iran.

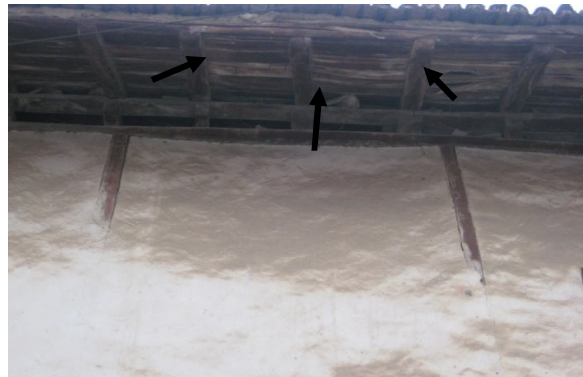


Figure2.18. Application of wood for constructing the skeleton of the building in Hashemian's house from Qajar period, Amol, Mazandaran, Iran.

### Conclusion

It is indicated, from the observations and studies, that wood has been applied in different parts of buildings from Islamic era, including but not limited to the following parts: skeleton of the body, skeleton of roof, the top of the minaret in mosques, vault, staircase, bricklaying to decrease the pressure imposed to underlying bricks, horseshoe ports, brace, bump, flooring, etc. It could be concluded that wide-spread application of wood in building, even in its sensitive parts, is one of the important elements in architecture.

### Purpose of the Research

Since there are rare references that particularly studied the application of wooden structures in Islamic architecture of Mazandaran, we tried to explain some of these applications through pictures which are obtained through field research and studies; the findings obtained with respect to implicit perception of the below reference and will be provided for researchers and students.

### REFERENCES

1. Kiani, Mohammad Yousef; Iranian Architecture Islamic Era; Tehran; The Organization for Researching and Composing University Textbooks in the Humanities (Samt); 2008.