



*Original Contribution*

**WOODEN CARCASE SYSTEM IN TRADITIONAL HOUSING  
ARCHITECTURE: EDİRNE SAMPLE**

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**ABSTRACT**

The concept of “house” which has been developed by human beings for protecting themselves from the powers and dangers existing in nature has shown discrepancies in its historical process. While the caves were used for accommodation by primitive people, the accommodation systems have shifted to various forms with social developments. Those systems have reflected the life styles and traces of the main developments in the communities. The people in those communities used building materials which were dominantly chosen from natural materials such as stone, wood which were available in their environments. Later, they began to use different materials such as adobe brick and brick which could be produced by using traditional facilities. The first architectural structures appeared in this way.

Edirne, which has the longest history since the pre-historical periods, embraces different cultural values and civilizations. Therefore, the city reflects the traces of different civilizations in their architecture systems and material selections.

In this study, the wooden carcass building system, which was dominantly used in traditional housing architecture in Edirne, has been examined as regards its structure and materials. It has been detected that stone, wood and soil (adobe brick, brick) were mainly used in the embankment parts of the wooden carcass and the walls were covered with wood and battening plaster. In those houses, the ornaments made of wood, plaster and carving are the most remarkable indications.

**Key Words:** Wooden carcass systems, Traditional building, Edirne House

**INTRODUCTION**

The building systems and materials in a settlement that form the urban texture and the architectural character have some changes by the topographic, geologic and climatic conditions, flora, cultural values the characteristics of the social life. It is seen that there will be different solutions for planning by using the traditional building materials (stone, wood and soil). In this way, settlement patterns having different qualities and varieties appear<sub>1</sub>.

In this study, wooden carcass system in Edirne houses is examined in terms of structure and material usage. Edirne was the capital city of Ottoman Empire, from 1361 to 1453 capture of Istanbul; after that time it had been chosen by the sultans and it kept its importance. Traditional-architectural samples in Edirne belong to late 19<sup>th</sup> and the beginning of 20<sup>th</sup> century.

In production of wooden structure, the solutions that supply the life conditions of all ages would be found. This system that supply various wants have an important rare as sustainability from the time that human come into being.

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## DEVELOPING OF HOUSING CONCEPT IN EDİRNE

House is a building type that supplies the human's physical, social, economical and esthetical needs. Housing concept, parallel with human's needs and technologic developments, has changed in time. Houses, the first building examples, show changes in every region according to material and climatic conditions.

Edirne had passed into the hands of Ottoman Empire in 1361, became the capital city of Empire in 1365 and carried out this mission 91 years long. Being in a land that has a geopolitical importance, the city had passed through many hands in history and also sheltered lots of civilizations. Although it had been destroyed and burnt. Especially the big fire in 1745 and the earthquake in 1751 caused huge damages in the city. In early 20<sup>th</sup> century, the city had been under the Balkan States' military occupation and then by the Lozan Agreement at 1923 it became the border city of Turkish Republic.

The examples of traditional residential architecture in Edirne could be seen at the historical city core (Kaleiçi, Karanfiloğlu, Bostanpazarı, Kıyık, Küçükpazar, etc...). In houses that there are so many standing examples here the regional situations and life conditions take role in material use. In these houses, it is seen that the traditional building materials; wood, stone and soil, is used in a harmony where the bearing elements and the others are composed. There are so many timber-materials in Trakya Region and the total forest places in this region are 463.946 hectares. %22 of these places are located in Edirne. For this reason, (timber-structure) wooden carcass system is seen in traditional city residents and stone, adobe, brickwork are used in filled parts. Generally walls are covered with wood or lath-work.

Developing of housing concept in Edirne has changed with time like in the other settlements. Because of the industrialisation and also the increasing of the population a whole amount of housing demands arised. With the establishing of Trakya University in 1980, this demand has increased. As a result of that, building cooperatives had founded and new settlements were being organized. The old traditional architecture was abandoned in early 20<sup>th</sup> century according to the usage of concrete and iron and also growing mechanization. After that date, Edirne's new settlement gravitated and reinforced concrete

carcase is used as the building system. The wooden carcass buildings are placed only in the historical city centre.

## WOODEN CARCASS SYSTEM

Skeleton constructions are chosen instead of block system because of the heavy building charge, space closing problems. These skeleton systems are lighter and it can be done higher buildings and also it can be used small amount of material with them. Wooden structural systems take the bearing mission of one-sized wooden components and also these systems are cheaper than the components. Wooden structural systems have developed by composing a bearing system and filling the empty spaces between the wood elements with various materials. These wooden carcass systems are generally used in residential buildings and sometimes in official buildings that need growing.

Wooden carcass systems have two parts having two different functions.

- Bearing part (carcase)
- Coating and Filling Part

### Bearing Part (Carcass)

Wood, being a natural and an organic material, is often used in building production. Flexibility and lightness of wood besides the mechanical properties increase the building earthquake resistance.

In wooden buildings, footings and basement wall-if there is- are being done as stonework, after that a basement wall that is nearly 100 cm. High is built and than a raising plate is placed at the top of the wall. This plate is called inferior foot. Poles are located upon the inferior foot by equal intervals to corners, wall intersections and nearby the window or door ways. These vertical elements (pole) that have the measures like 8/12, 10/12, 10/14 are combined at the top of the system with upper foot. A space as 80 or 100 cm long is leaved between the poles and then some diagonal elements are placed between these poles. These elements are named as braces. Counter-bracings are done to separate the spaces between the brace and pole into small boxes. Top rails are put onto windows and doors and the bottom rails are put under the windows (Figure 1.) [Türkçü, Ç].

In the examples that are examined in Edirne, in general multi-floored structures are being made. In these structures, braces work for bearing the charges to foots and then the

ground by forming a triangle that take the lateral thrusts between two floors.

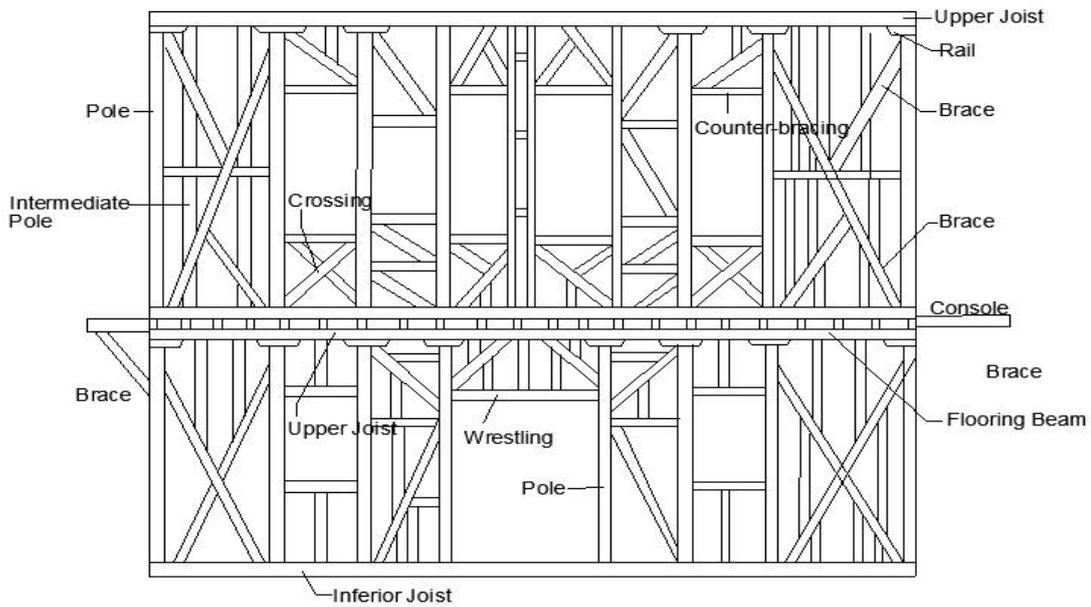


Figure 1. Elements that compose Wooden Carcase Systems

**Coating and Filling Material**

In the system that a explained above, walls are formed by filling the spaces between the structural elements with different building materials. It is seen that the filling materials can be stone, adobe or brick. (Figure 2.)

Generally, quarry stone, solid brick and adobe blocks are bonded with loam mortar. Filling technique that is done by using brick or adobe is called as stud work.

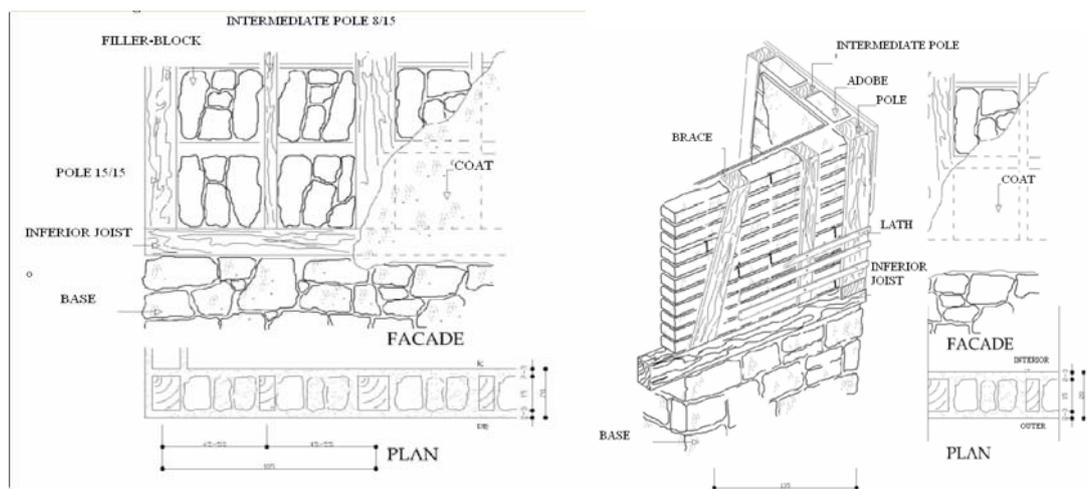


Figure 2. Filling the spaces between the structural elements with filling materials [Onel, H.]

In Edirne, it is examined that the structural systems is not being leaved with its original view, generally it is being coated. Plaster, battening coat, timber coat is used for coating. Lags or reeds are driven into wooden carcase system with leaving 1,5-2 cm

distances [Günay, R].. Rabitz wire can be put onto the grid that was formed by these lags between the structures. Cement mortar is used on the rabitz wires or reeds (Figure 3., Photo 1.)

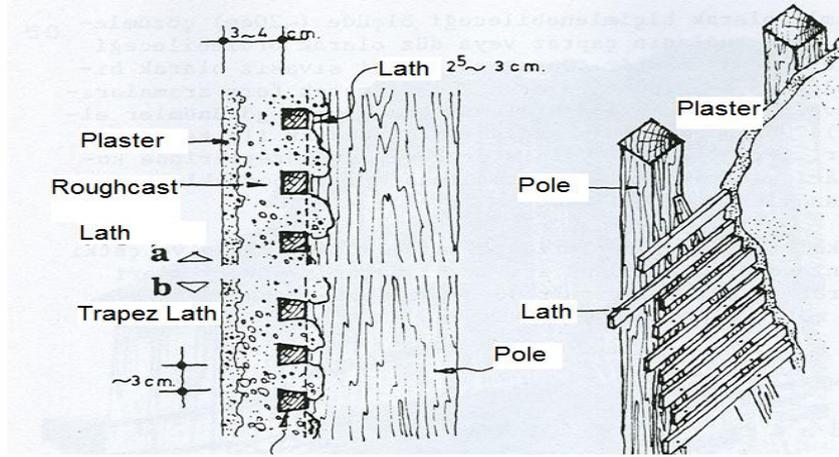


Figure 3. Coating the Wooden Carcase Buildings with Battening Coat



Photo 1. Coating the Wooden Carcase Buildings with Battening Coat

The other method that is used for coating wooden carcass system is covering it with wooden laths (Photo 2.). The wooden laths are placed on the wall with different details (Figure 4.).

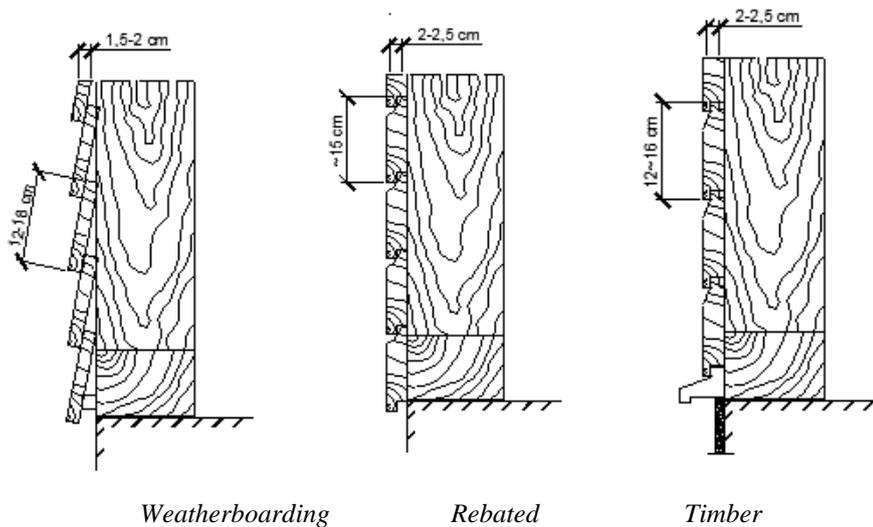


Figure 4. Coating Wooden Carcase System with Wooden Laths [Önel, H]



*Photo 2. Coating carcass system with timber*

## CONCLUSION

Men have lived in a comfortable condition when they are using the traditional system that is an inspiration origin for today's modern systems. Otherwise they used the building materials conformable by taking the advantages of these materials mechanical and physical properties. Number of the houses that are generally wooden carcass structured and also which are the examples of traditional residential architecture in Edirne is decreasing day by day. Wooden carcass buildings are used intensively because the material isn't heavy, mould is not used, quickly organized, it's durable especially against the earthquakes. These buildings have great importance while they combine the past and the future. Wooden carcass system is one of the preferred systems of the day because of the advantageous properties. On the other hand; characteristics of the material as being

ecological and renewable won't be forgotten and also it's a durable material against fire if the precautions would be taken.

This structural system which supplies the man comfort in all natural conditions can be applied in today's technology by using new technological materials like gas concrete or heat insulation board in coating and filling.

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