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Araştırma Makalesi / Research Article

AN INVESTIGATION on TRADITIONAL TIMBER-FRAMED BUILDINGS in ÇANKIRI PROVINCE of TURKEY

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Abstract: *Çankırı province lies on the North Anatolian Fault zone, which is why the area suffers frequent minor earthquakes. On the other hand, Çankırı has experienced major earthquakes also. An earthquake with a magnitude of 5.9 shook Orta District in Çankırı and the surrounding villages on 6th of June 2000. The aim of this study is to record construction systems of traditional timber-framed buildings, which survived this earthquake, in Çankırı province of Turkey. In addition, investigate thoughts and experiences of the inhabitants in the region with regard to their traditional houses and 2000 earthquake is aimed. Research was undertaken in Çankırı province in 2005. Kalfat Yuva, Kısaç, Dodurga, Ortabayındır, and Aşağı Kayı Villages of Orta District were visited and traditional buildings were observed. Three timber-framed with masonry infill houses in Yuva Village, which show the characteristics of the traditional buildings in the region, were measured and drawings were made of their construction systems. These systems have demonstrated their resistance to earthquake-collapse in previous earthquakes. Timber-framed buildings in Çankırı province are an important part of the cultural heritage of this region. However, they are not constructed anymore, having been displaced by reinforced concrete construction. Reasons for is a combination of scarcity of timber, high cost of the construction, lack of experts about traditional construction systems, and preferences of the people in the region.*

Anahtar Kelimeler: *Timber-framed buildings, earthquake, traditional houses, Çankırı*

Çankırı'daki Geleneksel Ahşap Karkas Yapılar Üzerine Bir İnceleme

Özet: *Kuzey Anadolu Fay Hattında bulunmakta olan Çankırı'da sık sık küçük depremler meydana gelmektedir. Diğer taraftan, Çankırı büyük depremler de geçirmiştir. Yörede can ve mal kaybına neden olan son deprem 2000 yılında meydana gelmiştir. 6 Haziran 2000 tarihinde olan 5.9 şiddetindeki deprem Çankırı'nın Orta ilçesi ve çevresindeki köyleri etkilemiştir. Afet geçirmiş olan bu yörede 2005 yılında bir araştırma yapılmış ve ahşap karkas yapıların çoğunun hafif hasarlı veya hasarsız olduğu gözlenmiştir. Bu çalışmanın amacı yörenin geleneksel ahşap konutlarının yapım sistemlerini anlamaktır. Yöredeki geleneksel ahşap konutlarının özelliklerini taşıyan 3 adet konutun rölöveleri alınmış ve çizimleri yapılmıştır. Ek olarak, yöre halkından 8 kişiyle depremle ilgili deneyimleri ve yöredeki geleneksel ahşap yapılar hakkında görüşülmüştür. Çankırı'nın köylerindeki geleneksel ahşap yapılar bu bölgenin kültürel mirasının önemli bir bölümünü oluşturmaktadır. Fakat, betonarmenin gündeme gelmesiyle birlikte bu yapılar artık inşa edilmemektedir. Ahşap malzemenin azlığı, yapım maliyeti, geleneksel yapım sistemleri konusundaki uzmanların yokluğu ve bölge halkının tercihleri bu duruma neden olarak gösterilebilir.*

Keywords: *Ahşap karkas yapılar, deprem, geleneksel konutlar, Çankırı*

INTRODUCTION

Timber-framed houses form 80% of the total number of houses registered as cultural objects in Turkey. The recent and rising trust of the public in new timber-framed structures due to the consequences of earthquakes should also be oriented to the conservation of traditional buildings. This approach will make a considerable contribution towards the protection of Turkey's cultural heritage. In order to achieve this purpose, the measures developed in the timber-framed building tradition against earthquakes should be well understood. (Şahin Güçhan, 2007). When people understand historic structures not only as archaic and obsolete building systems, but also as repositories of generations of thought and knowledge of how to live well on local resources, societies can begin to rediscover the value of these traditions once again by seeing them in a new light – one that, at its most fundamental level, can save lives (Langenbach, 2008a)

Well-built timber structures usually have a good performance under the influence of wind and especially earthquake forces. Wood itself is a resilient material with a large capacity for its weight in tension, compression, and bending. Additionally, in modern stud-frame construction with its multiple timber elements of small dimension connected with machine made nails, the system is highly redundant, and both flexible, and demonstrates good ductility and energy dissipation as a system (Dobrila and Bedenik, 2004).

Being located on the Mediterranean-Himalayan seismic belt, Turkey is prone to frequent earthquakes. According to Günay (1998) it can be said that this is a reason why timber framed buildings were developed and became widespread in the country. Timber framed systems with nailed connections are resistant to horizontal forces and also secure due to their light weight and tensile strength.

In Turkey, prior to the proliferation of saw mills capable of making timber boards for siding available, timber frames were most often infilled with fired or unfired brick, or stone, masonry to form the interior and exterior walls of buildings. Of course this resulted in much heavier buildings, and thus larger seismic loads than do 100% timber buildings, but never the less, it has been observed by a number of scholars that this type of construction has demonstrated more resilience in earthquakes than many people would expect based on its thin walls and light frame construction. In explaining how this is possible, Langenbach (2000) says that traditional infill-frame construction, where masonry panels are inserted into a timber frame, has the ability to dissipate earthquake's energy over a long period without undergoing a rapid structural degradation.

Timber is one of the oldest construction materials used in Turkey. Timber framed buildings, which are the products of thousands of years and are cultural heritage of people who live in this region, were mostly constructed until approximately 1960. After then reinforced concrete and concrete block masonry were preferred to timber framed buildings (Doğangün *et al*., 2005).

Çankırı province lies on the North Anatolian Fault zone, which is why the area suffers frequent minor earthquakes. On the other hand, Çankırı has experienced major earthquakes also. The earthquakes of 1944 and 1949 struck with a magnitude of 7.2, that of 1951 had a magnitude of 6.9, while that of 1953 had a magnitude of 6.1 and the most recent major earthquake which struck in 2000 had a magnitude of 5.9 on the Richter Scale. According to Demirtaş *et al.* (2000) damage was especially concentrated in rural areas consisting of Yuva, Kısaç, Salur, Buğuören, Elden, Dodurga, Ortabayındır, Derebayındır and Tutmaçbayındır Villages of Orta district due to the last earthquake. Most of the heavily damaged houses were adobe and stone masonry structures. After the earthquake 1221 post-disaster houses were constructed in the region. Some of the beneficiaries moved to these brick masonry single storied houses; however most did not.

The aim of this study is to record construction systems of traditional timber-framed buildings in Çankırı province of Turkey and also to investigate the opinions and experiences of the inhabitants in the region with regard to their traditional houses and the effects of the 2000 earthquake. Research was undertaken in Çankırı province in 2005. Kalfat Yuva, Kısaç, Buğuören, Dodurga, Ortabayındır, and Aşağı Kayı Villages of Orta District were visited and traditional buildings were observed. There are two types of traditional construction systems in the region: timber-frame with masonry infill and composite system with unreinforced masonry ground floors and timber-frame with masonry infill second floors. Besides these types, masonry and reinforced concrete structures can also be seen in the villages of Çankırı. The region was visited in 2005 and it was observed that most of the timber-framed structures had little or no damage during the earthquake (Figure 1, 2, and 3).

Three timber-framed with masonry infill houses in Yuva Village, which show the characteristics of the traditional buildings in the region, were selected for the investigation. Two of the houses had been abandoned and one was still occupied at the time of the research. Plaster on the walls of the three houses had fallen down revealing the underlying structural systems of the buildings, which thus could be observed and measured. The houses were measured and their construction systems were drawn accordingly. In addition eight people, who have been living in this region for many years, were interviewed in order to learn their experiences and thoughts with regard to their traditional houses and the 2000 earthquake. One of the people interviewed used to be the assistant to an expert carpenter who had constructed timber-framed buildings. He was asked about his experiences about the construction of the timber-framed buildings and reasons why people had stopped building timber frame buildings in the region.

Figure 1. Timber-framed buildings in Yuva Village

Figure 2. A house in Kalfat Village

Figure 3. A house in Dodurga Village

TRADITIONAL TIMBER-FRAMED STRUCTURES and EARTHQUAKES in TURKEY

Apart from the 100% timber frame with open pocket walls and clapboard exterior or plaster and lath interior skin found predominantly in Istanbul, there are, in general, two types of timber-framed structures in Turkey. One is where the timber frame is nogged – that is filled in the plane of the frame with a single layer of masonry of the same thickness as the timbers in the frame (*hımış* in Turkish). Another is where the timber frame is covered with a wood lath, and the resulting pocket confined by the lath and framing timbers is filled with a rubble mixture bedded into a mortar of mud or lime and mud (*bağdadi* in Turkish). This system resembles *bahareque* which is found in Central and South America (Langenbach 1989).

In *hımış*, a skeleton is formed by placing wooden posts vertically and diagonally. Then the openings are filled with infill materials such as fired clay bricks, adobe blocks, or stone, which can easily and economically be obtained in the region. The use of mud mortar for the infill masonry is widespread and the walls are either left exposed or plastered with mud and then whitewashed (Diren and Aydın, 2000).

Bağdadi type of timber-framed structures was developed in the regions where the climate is moderate and timber is abundant. In this system timber laths which are 3-4 cm. in width and 1-2 cm. in thickness were nailed on the interior and exterior of the timber-frame. Spaces between the timber laths are generally 2-3 cm. These spaces were filled with bark and pudding stones or left empty for insulation and interior and exterior surfaces were usually plastered with lime plaster (Bayülke, 2004).

In Turkey, houses were often designed with the laced bearing wall (*hatıl*) construction on the ground floor level, and *hımış* used for the upper stories. The upper story is almost always constructed with a structural timber frame infilled with a single-wythe (layer) of fired brick or stone masonry. This construction utilizes a weak mortar of mud or lime holding the masonry into a timber framework of studs rarely more than 60cm apart. The studs are themselves braced at mid-story height by horizontal timbers. Because the masonry is only one wythe in thickness, the walls are light enough to be supported on the beams and joists which often cantilevered out from the wall below to form bays which are characteristic of Turkish traditional domestic architecture (Langenbach, 2003).

Timber is a flexible material which can return to its former shape after bending during an earthquake. If beams (girders) and columns (posts) are strong and flexible enough, braced and tied together to work as unit, wooden walls can be capable of resisting large lateral forces caused by earthquakes. A timber frame may be filled with adobe, brick or stone to form the enclosure and partitions of timber frame buildings. The wooden skeleton of the traditional Turkish house can stand on its own as a self supporting system. The timber elements are simply nailed or pegged together, but the framework is stabilized by the use of diagonal members (Tobriner, 2005) and the infill masonry (Langenbach 2000) (Figure 4). Because timber is resistant to shock affect and have the ability to absorb vibration, the combined system of masonry and timber has in past earthquake demonstrated a resistance to earthquake forces. Besides, even though the building is likely to be damaged during earthquake, the probability of collapse and consequential loss of life is very low (Avlar, 2002).

Figure 4. Diagonal members of a timber-framed building

Gülhan and Güney (2000) classifies the damages determined in timber frame structures can be classified as: *slightly damaged;* where vertical cracks were mostly placed either at the corners or at the mid of the walls (0.5mm.), *moderately damaged;* vertical and horizontal cracks on the walls (2mm or greater), corner cracking especially at openings, wall deformation, deformation of walls along the wooden beams and separation of walls from the beams, roof separation from wall, *highly damaged;* partial or total structural collapse.

While weaknesses from environmental deterioration may be hidden, any damage that has occurred after an earthquake will usually be visible, yet the structural effects of such damage may not be easily understood. Because a large part of the earthquake resistance of traditional buildings is a direct product of their inelastic behaviour and the resulting energy dissipation from the friction and cracking of their materials, there may be extensive amounts of fallen plaster and other disruptions, yet this does not necessarily mean the structure has lost a significant amount of its earthquake resistant capacity, or even to have reached their ultimate strength. By contrast, small cracks in reinforced concrete structures, depending on where they are, may be indicative of much greater vulnerability to collapse than even larger cracks in traditional buildings (Langenbach, 2008b) (Figure 5). Although type of traditional timber buildings varies in different earthquake zones, according to Doğangün *et al.* (2005), their damages caused by earthquakes can be classified as follows:

Cracking and falling of plaster; since timber works during earthquakes this leads to shedding of plaster of the timber framed buildings.

Crack of mortar; when field rubble is used and bonded with mud mortar without quoins and with no through stones *etc*., mortar fails during earthquakes.

Loose or failing of connections, the connections of roofs, floors, vertical and horizontal elements and bracing elements makes the building a single solid structure. The connections between the members must be strong enough to hold together without loosening or completely separating.

Lateral large displacements; although timber-framed, masonry-infilled structures do not have much lateral strength, past earthquakes have demonstrated that they have lateral capacity. These buildings respond to seismic forces by shaking with them, rather than resisting to these forces.

Dislodgement of the masonry infill; the nogged (*hımış*) construction does not have mechanical ties between the timber and the masonry infill. As a result, in some cases masonry infill such as stones, bricks and adobes has fallen out of the frame. The performance of walls with smaller panels of brick has been better in earthquakes than those with large panels.

Failure of connection to foundation; foundations of traditional timber framed buildings in Turkey generally consist of rubble masonry with lime mortar. Also, these buildings were mostly built without any bolts to connect the framing elements to foundation.

Failure of chimneys; failure of chimneys can generally cause damage of roof and walls of the building. In addition, sometimes failure of chimney leads to fire.

Collapse of other buildings on it; neighboring buildings may collapse on the traditional building and this may cause damage.

Figure 5. Cracks in a timber-framed structure.

EVALUATION of TRADITIONAL TIMBER-FRAMED STRUCTURES in the VILLAGES of ÇANKIRI PROVINCE

Survey conducted in the villages of Çankırı revealed that traditional construction system is timber frame with masonry infill in this region. In this system, which is called as "*yeğdane*" in the region, infill of the timber-frame is either sun-dried brick or natural stone. For instance, in Yuva Village, nearly all of the timber-frames have sun-dried brick infill, whereas in Ortabayındır Village natural stone infill is commonly used. The reason for that can be the abundance of stone in Ortabayındır village. It was observed that most of the timber-framed buildings in Yuva village had minimal or no damage. The exterior and interior plaster in the houses was cracked and often fallen off due to the earthquake (Figure 6, 7 and 16).

Figure 6. Timber-framed structure with sun-dried brick infill (Yuva Village).

Composite, masonry and reinforced concrete structures are also seen in the region although they are not as common as timber-framed buildings. Composite structures have stone masonry first floors and timber-frame with sun-dried brick or natural stone infill second floors. In some houses in Yuva Village three walls of the ground floor excluding the front wall were constructed with stone masonry, whereas the front wall and the top floor was constructed with timber-frame structure with sun-dried brick infill. Examples of composite structures are seen in Figures 7 and 8. Although, they are not very common, houses which have reinforced concrete frames with brick infill can also be seen in the villages.

Figure 7. Composite structure: Stone masonry first floor and timber-frame with sun-dried brick infill (Yuva Village).

Figure 8. Composite structure: Stone masonry first floor and timber-frame with stone infill (Ortabayındır Village).

Traditional timber framed systems in this region consist of sole plates, beams, window headers, diagonal members, window sills, girders, door headers, studs, posts, foot plates and infill material (Figure 9). Posts are placed at the corners of the frame on the floor plates and define the basic axis of the building. Studs are secondary posts which are used for dividing the distance between the posts (Er Akan, 2004). Foot plates are used for carrying the studs and the posts. Diagonal members strengthen the frame system against lateral forces (Güçhan, 2007). In addition, windows and doors are tied to the structure with the help of window headers, window sills and door headers. Girders are placed on the beams which are located on the posts. A system view of a traditional timber framed house in Yuva village, which had been abandoned before the earthquake, is seen in the Figure 10. Furthermore, Figure 11 presents first floor plan of the building.

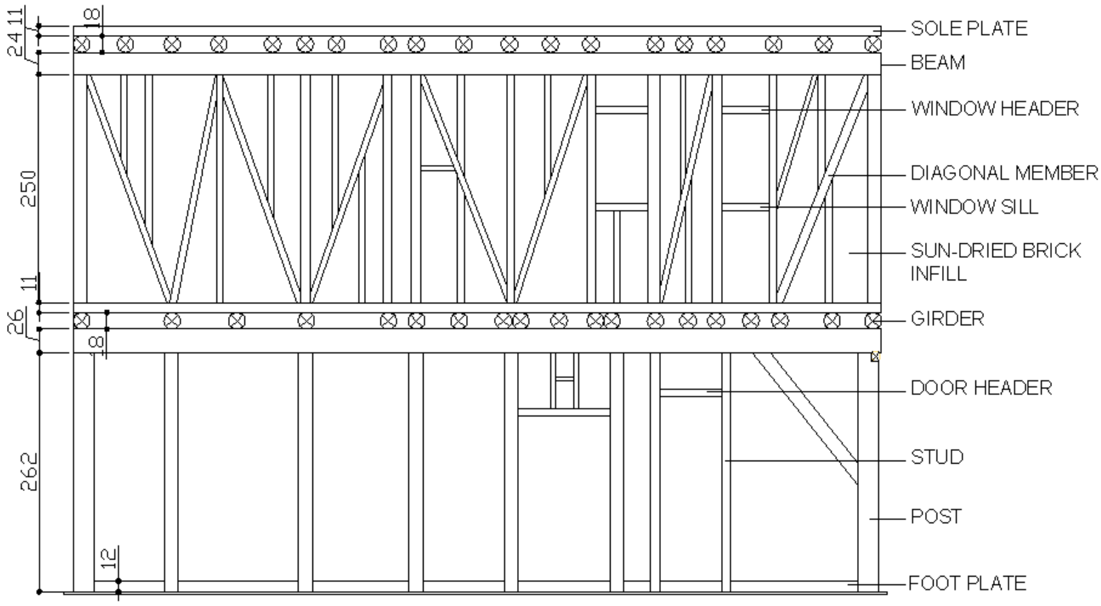

Figure 9. Elements of a timber-framed building in Yuva Village (House 1).

Figure 10. Posts, beams and girders (House 1).

Figure 12 shows the flooring detail of the timber framed structures in Yuva village. The girders are covered with branches and the branches are covered with earth. In this type of structures although thickness of the earth is about 3 cm when a new house is first completed, it becomes thicker in time because earth needs to be maintained by adding new layers. This is a disadvantage from the point view of earthquake resistance of the structure because the building becomes heavier in time.

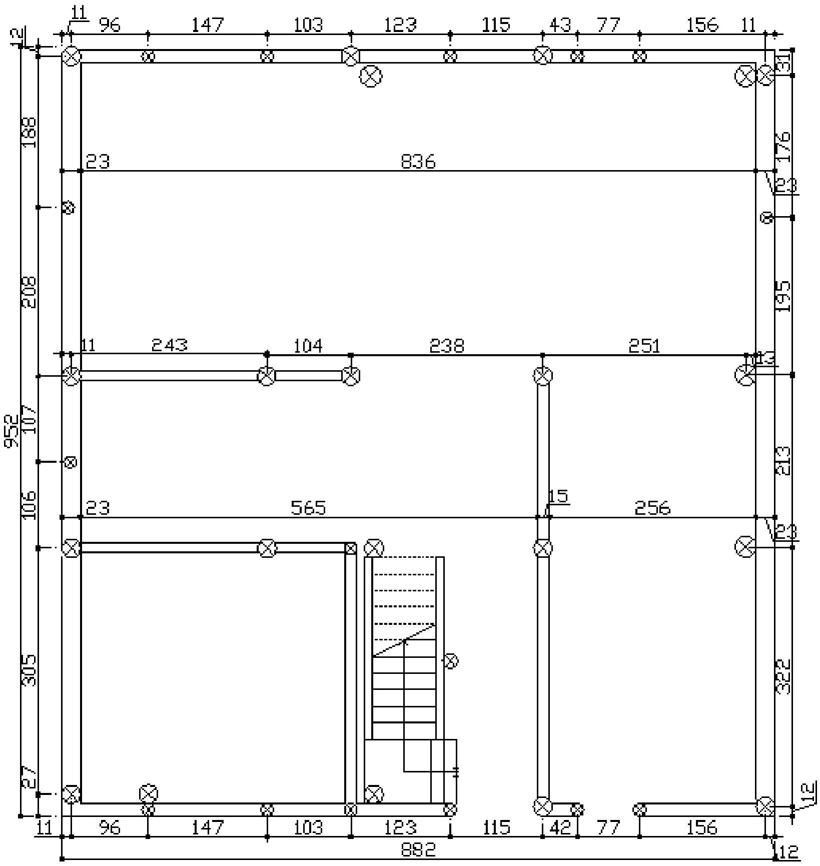

Figure 11. First floor plan of a traditional timber framed building in Yuva village (House 1).

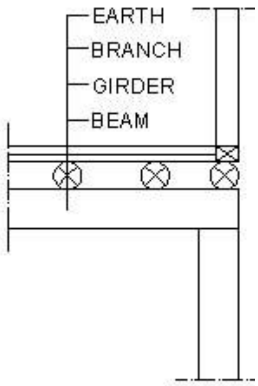

Figure 12. Flooring Detail

Nails are used to tie the timber elements to each other (Figure 13). The inhabitants of the region claim that nail was used consciously for construction of these buildings because it makes the structure more flexible. According to Sayıl (2001), use of nails and screws to tie the timber elements helps to absorb and as a result lower the movements created by earthquakes.

Figure 13. Nail used to tie the timber elements

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The system consistin of posts, studs, girders, diagonal members *etc.* can be considered as a pattern in the region since nearly all of the timber-frames were formed in the same way. Figures 14 and 15 show façades of the other timber-framed houses measued. It can be seen that timber elements were combined in the same way as described above.

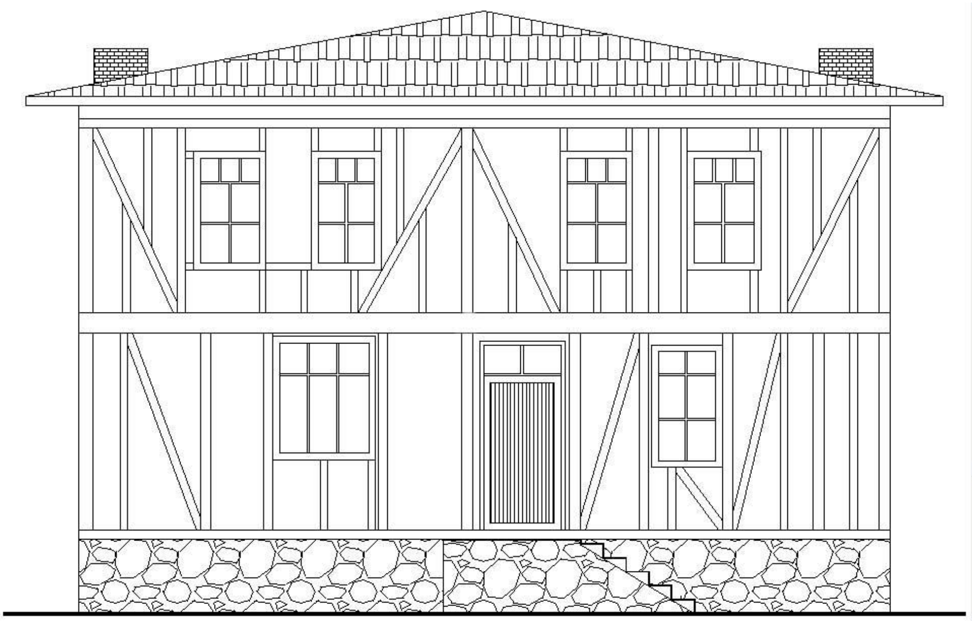

Figure 14. Façade of a timber-framed house (House 2).

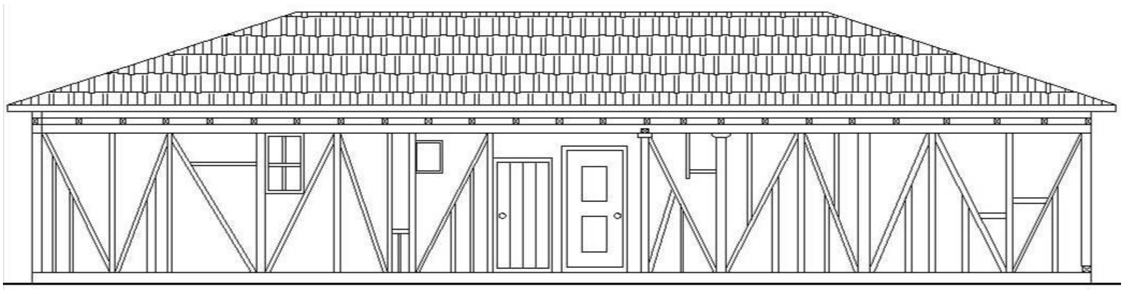

Figure 15. Façade of a timber-framed house (House 3).

Some masonry barns in the region were heavily damaged due to the earthquake occurred in 2000. However, the damage to timber framed buildings caused by the earthquake was mostly limited to cracking and falling of plaster (Figure 1 and 11) and dislodgement of the masonry infill (Figure 8) in the villages of Çankırı. In general, plaster on the timber elements were cracked and fallen. It can be said that abandoned houses had heavier damages since they had not been maintained for years, and thus many of the timbers were in an advanced state of decay. However, as a demonstration of their resilience, these heavily decayed and abandoned buildings did not collapse.

Langenbach (2008b) explains the behaviour of timber framed buildings against earthquakes based on his observations in India, Pakistan and Turkey. He says that it was evident that the infill masonry walls responded to the stress of the earthquake by "working" along the joints between the infilling and the timber frame; the straining and sliding of the masonry and timbers dissipated a significant amount of the energy of the earthquake. The only visible manifestation of this internal movement was the presence of cracks in the interior plaster along the walls and at the corners of the rooms, revealing the pattern of the timbers embedded in the masonry underneath. On the exterior, where there was usually no plaster coating, the movement of the panels often was not very visible. The movement was primarily along the interface between the timbers and the brick panels where a construction joint already exists. Because of the timber studs that subdivide the infill, the loss of masonry panels did not lead progressively to the destruction of the rest of the wall. The closely spaced studs prevented propagation of "X" cracks and reduced the possibility of the masonry falling out of the frame. Where it was observed that large sections did fall out, it could most often be attributed to rotted timbers or oversized panels or both, and the structures involved were often barns rather than houses.

An important additional factor in the performance of the walls was the use of weak, rather than strong mortar together with bricks that are stronger than the mortar. The mud or weak lime mortar tended to encourage sliding along the masonry bedding planes instead of cracking through the masonry units when the masonry panels deformed. This reduced the contrast between rigid masonry panels and the flexible surrounding frames. In Orta earthquake many "*hımış"* houses did suffer widespread cracking and shedding of plaster and stucco, and a few had damage to the infill masonry, but except where the timbers were seriously rotted, none collapsed. (Langenbach, 2003).

The traditional buildings that survived the earthquake were not engineered, and lacked both steel and concrete. No plans for them were ever inspected, because none were ever drawn. They were only rarely erected by anyone who could remotely be characterized as a professionally trained designer or builder, nor could many of them be characterized as having been carefully constructed. On the contrary, they were constructed with a minimum of tools, with locally acquired materials, and employed only a minimum of nails and fasteners (Langenbach, 2008).

INTERVIEWS with the INHABITANTS in the REGION

During the field survey interviews were done with eight disaster victims in the villages of Çankırı. Three of these people are post-disaster occupants; one is a person who rejected plans to move to a post-disaster house; one used to assist an expert about construction of traditional timber-framed buildings and two are the people whose houses had no damage during the earthquake.

(1) Occupants of the post-disaster houses shared their experience about the earthquake and feelings about their old and new houses:

"I knew that my house was not going to collapse but the sound occurred during the earthquake made me afraid. I know that "Yeğdane" is safe but I did not want to stay in my house any more after the earthquake because of that sound. However although I feel safe, I am not happy to live in the post-disaster house since it is not big not big enough for my family and very far from my fields". (Male, 60, farmer)

"A sound occurred in the timber-frame when the building was shaking. My wife was very afraid because of this sound during the earthquake and we preferred to move to this house. My old house was big enough for my family and appropriate to our daily life activities. In addition, because my house was made of stone and sun-dried brick and the walls were thick, it was warm enough in the winter months and cool enough in the summer months. We are not happy to live in the post-disaster house because it is small and difficult to keep warm". (Male, 70, retired farmer)

"I know that "yeğdane" does not collapse because of an earthquake. Interior and exterior plaster of my house fell down during the earthquake in 2000 and it was easy to repair it. I preferred to move to the post-disaster house since this house is made up brick and cement. It is easy to clean this house but difficult to use. When my children and grandchildren come to visit us they sleep in the living room, to which other rooms open, and we have to go through this space when we need to use WC" (Figure 16). (Female, 65, farmer)

"My house was old and very difficult to clean. Although it was slightly damaged I and my husband preferred to move to the post-disaster house. We could maintain and went on living in our house but we wanted to live in a new house. We experienced another earthquake in this house and felt safe because there was no sound. However, our old house was more appropriate to our way life. There were cattle shed, hay-barn and bakery which are important spaces for our life". (Female, 62)

(2) Following quotes are the expressions of the villagers who refused to move to the post-disaster houses:
The traditional house of Ismail Ozturk who lives in Dodurga Village was moderately damaged during the earthquake and he rejected to move to post-disaster house (Figure 17). He asked for financial and professional help to strengthen his house. The following is the expression of him:

Figure 16. Interior and exterior views of House 1

"One of the timber posts on the corner was damaged and the Government authorities recorded me as a post-disaster house beneficiary. I rejected to leave my house because it was easy to repair it. Government provided finance and engineers to repair my house. I am living with my wife, son and my son's family in this house. We are a big family and I have animals. I knew that I would not be happy to live in the post-disaster house. Post-disaster houses are not appropriate for big families and also there is no cattle shed for the animals". (Male, 72, farmer)

Figure 17. Repaired timber-framed building

"I remember the construction of my house. I was a child and watched the workmen fixing the timber elements to each other by using nails. My house had no damage due to the earthquake. People in this region know that timber-framed buildings are earthquake resistant but most of them preferred to move to post-disaster hoses because they are new". (Male, 70, retired farmer)
"My house swayed during the earthquake. It was frightening but only some of the plaster fell down, nothing else happened. Diagonals were placed in the timber-framed buildings and nails were used consciously to tie timber elements because of the earthquake factor. Nails help building to sway during the earthquake. This system is not being constructed any more because timber is an expensive building material and constructors he built timber-framed buildings in this region are not alive". (Male, 75, retired farmer)
(3) A 42 year old constructor Mevlüt Alacapınar, who used to assist an expert about construction of timber-framed buildings, was interviewed for this study. He said that timber posts were placed 1 m. apart and diagonal timber

members were fixed to the posts. The workman said that timber-framed buildings were constructed in a way that they could resist to earthquake forces and because of that, diagonal members were consciously placed in the structure. He said that he learned this from the older workmen he used to work with. Stone and sun-dried brick were used as infill materials since they were easily available. They cut trees in this region and prepared them for the construction. Mr. Alacapınar went on saying that they generally used willow and poplar and sometimes pine tress for the construction of timber-framed buildings. They put soil with a thickness of 3 cm. on the timber flooring and the important thing here is that soil should involve clay. He told that the soil of this region has of perlite in it which helps resistance to water. When asked about the reason for not constructing timber-framed buildings in this region any more, he told that experts about construction of timber-framed buildings are not alive and timber is an expensive building material.

CONCLUSION

The earthquake risk is just one way in which we can observe what this revolution in construction practice represents in terms of a loss of cultural and technical knowledge and memory. Earthquakes have proven to be particularly unforgiving when the new ways of building are not sufficiently well understood or respected to be carried out to an acceptable level of safety. Moreover, by learning from indigenous pre-modern examples of earthquake resistant technologies, we can learn to preserve the surviving examples of these now seemingly ancient ways of building in a way that respects what these buildings are, not just how they look (Langenbach, 2008a).

Timber-framed with masonry infill structures were constructed in the villages of Çankırı, where is an earthquake prone area, for many years. These systems which could withstand earthquakes for years are not constructed anymore in this region. Reasons for this can be scarcity of timber, high cost of the construction, lack of experts about traditional construction systems, and preferences of the people in the region.

According to the interviews with the inhabitants, the sound occurred when the timber-framed building is shaking makes people be afraid. However, people interviewed also mentioned that they thought that their house was earthquake resistant. Timber-framed buildings in Çankırı province are an important part of the cultural heritage of this region. As referred from the interviews and according to the research done by Dikmen (2005) traditional buildings evolved according to the daily life activities of the inhabitants in this region. However, some of the villagers preferred to move to post-disaster houses simply because they are new and easier to clean. It can be said that houses constructed with contemporary building materials are attractive to the villagers. Since examples of traditional timber-framed systems are still available they should be researched, understood and used as guides while studying on new construction materials and techniques in earthquake prone regions.

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