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AUTHENTIC WALLING TECHNIQUE OF TRADITIONAL HOUSES IN AKSEKİ: CASE STUDY ON ORMANA

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Keywords

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Construction Technique

Abstract

The historical buildings and environments in Anatolia are notable examples of a particular architecture style, and display the artistry, craftsmanship and technology of their period. The architectural profession has a long history in Anatolia with a rich tradition developed by the immense variety of the regional, local and national techniques. This variety of forms, techniques and materials in Anatolian vernacular architecture can still be traced in settlements even at a close distance to each other in the Mediterranean Region. Ormana is a historic settlement, which represents the specific characteristics of the vernacular architecture of the Akseki-İbradı Basin.

Within the scope of this research study, buttoned wall – timber beamed masonry wall system which is constructed according to the characteristic construction technique of Akseki-İbradi basin is examined in detail.

GELENEKSEL AKSEKİ EVLERİNDEKİ ÖZGÜN DUVAR YAPIM TEKNİĞİ: ORMANA ALAN ÇALIŞMASI

Anahtar Kelimeler

Akseki

Ormana

Düğmeli Duvar

Yapım Tekniği

Özet

Mimarlık, Anadolu'da yöresel ve bölgesel çeşitlilikleri olan zengin ve uzun bir geçmişe sahiptir. Anadolu, yapıldığı dönemin sanatını, zanaatını ve teknolojisini anlamamızı sağlayan dikkate değer nitelikte ve nicelikte tarihi yapı ve tarihi çevreye ev sahipliği yapmaktadır. Yöresel mimarideki form, yapım tekniği ve malzemedeki bu zenginliğin ve çeşitliliğin varlığı Akdeniz Bölgesindeki birbirine çok yakın yerleşmelerde günümüzde hala izlenebilmektedir. Ormana, Akseki-İbradı Havzasının yöresel ve özgün mimari özelliklerini yansıtmakta olan tarihi bir yerleşim alanıdır.

Bu çalışma kapsamında, Akseki-İbradı Havzası'nda görülmekte olan "düğmeli duvar" adıyla bilinen ahşap hatıllarla güçlendirilmiş yığma taş duvar tekniği detaylı bir şekilde incelenmiştir.

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1. INTRODUCTION

The main objective of this study is to present some findings about a research that examines the traditional wall construction technique pertain to Akseki-İbradi basin in Antalya Region. This study is a part of the unpublished master thesis of the author which was supervised by Dr. Fuat Gökçe and named as "Construction Techniques of Four Traditional Ormana Houses" submitted to the METU, Graduate School of Natural and Applied Sciences, Department of Architecture-Restoration and is based on the data attained from the field studies conducted during various periods of 2007 in Akseki region.

According to Kavas (2015); in Akseki-İbradi basin, congregating form of the environmental factors depending on the mutual dependence principal has constituted genuine cultural values in architectural detail scale. Rubble stone that is substantially presented by the geomorphic structure and turpentine tree that is another environmental resource have together given rise to generation of a structural system coherent to environmental data. Interpretation of environmental data by culture has established the correlation between stone and timber. The most significant explicandum of the cultural identity in architectural details is, dry masonry wall system with timber beams which is also called "buttoned wall (düğmeli duvar)". Human's center of practice for designing the surrounding is constituted by this construction system (Kavas, 2015).

When this structure technique is discussed according to the archeological data, it is seen that, Anatolia reflects construction tradition, which dates back to thousands of years and shows sustainability with Bronze Age construction culture.

As Katipoğlu (2013) discloses, "Ottoman construction system is one of the most puzzling issues in the Ottoman History, even though recent researches reveal a significant amount of archival documents. While each document brings to light another unfamiliar practice in the construction activity, it also shows the irregularities and complexities of the system" (Katipoğlu, 2013).

Unfortunately, we cannot tell that local residential architecture of Anatolia is as lucky as Ottoman monumental structures with respect to finding written documents. Construction technique of the local architecture is possible only with detailed examination and documentation of the existing structure.

Within the scope of this research, buttoned wall – timber beamed masonry wall system, which is constructed according to the characteristic construction technique of Akseki-İbradi basin, is examined in detail.

The historical buildings and environments in Anatolia are notable examples of a particular architecture style, and display the artistry, craftsmanship and technology of their period. The architectural profession has a long history in Anatolia with a rich tradition developed by the immense variety of the regional, local and national techniques.

Forms of traditional construction types, which are developed throughout centuries, are the representatives of the forms compatible to climate. As of structure, they are compatible to user needs, and domestic economy and also constructed with local materials considering the regional climate conditions (Schittich, 2003).

Within in this context; Traditional dwellings in rural areas of Anatolia are the representatives of different architectural characteristics that vary from one region to another. In addition, they are the indicators of different material usage and construction techniques since they utilize the available local materials in their region. Besides, they also embrace various details according to their construction knowledge and necessities. This variety of forms, techniques and materials in Anatolian vernacular architecture can still be traced in settlements even at a close distance to each other in the Mediterranean Region.

Mediterranean Region is one of the most important areas of Anatolia, embracing quite a number of examples traditional vernacular architecture. Due to the geographic and climatic condition of the region, a variety of building types and settlement patterns are emerged. The physical formations of the region have unique characteristics, which are altering from one district to another.

Akseki-İbradi Basin is situated in the intersection point of Pisidya, Kilikya and Pamfilya which are three antique regions of Anatolia and in the headwaters of Manavgat River which it's ancient name is *Melas* (Özkaynak, 1954: 23). In the region, there are three important ancient settlements named as *Etenna* (Ivgal-Sinanhoca), *Kotenna* (Gödene-Menteşbey) ve *Erymna* (Ormana- Ardıçpınarı). However, the establishment dates of the settlements are unknown, archeological findings in the area show that, it leastwise dates back to Roman period (İşkan ve Çevik, 1999: 51).

Kavas States that settlement and architecture in Akseki-İbradi Basin is the output of the dialog between natural resources and communal requirements. Cultural surrounding is shaped with the repetition of a basic architectural detail. Dry masonry wall supported with timber and which is locally called as "piştuvan" wall is a construction system peculiar to Akseki-İbradi Basin (Kavas, 2011).

Ormana is a historic settlement, which represents the specific characteristics of the vernacular architecture of the Akseki-İbradı Basin. Ormana is located on the western part of the Mediterranean Region of the West Taurus Mountains and it is situated 850 m. above sea level. Furthermore, the town is located 3 km from İbradı, 30 km from Akseki and 155 km from Antalya.

Although it was a larger town in the past nowadays the settlement as the appearance of a village with a population of nearly 500 people. There were two major fires before 1992, one in 1915 and the other 1929. In 1915 almost 160 houses, mosque and shops were burned. In 1929, 20-30 roomed madrasa was burned down (Özbal, 1997).

There are approximately 300 traditional residential buildings and 49 of them are officially registered by the Ministry of Culture and Tourism as immovable cultural properties in 2003. In addition, part of the town was registered as an "historic urban site" in 2005 (Antalya Kültür Envanteri) (Figure1).

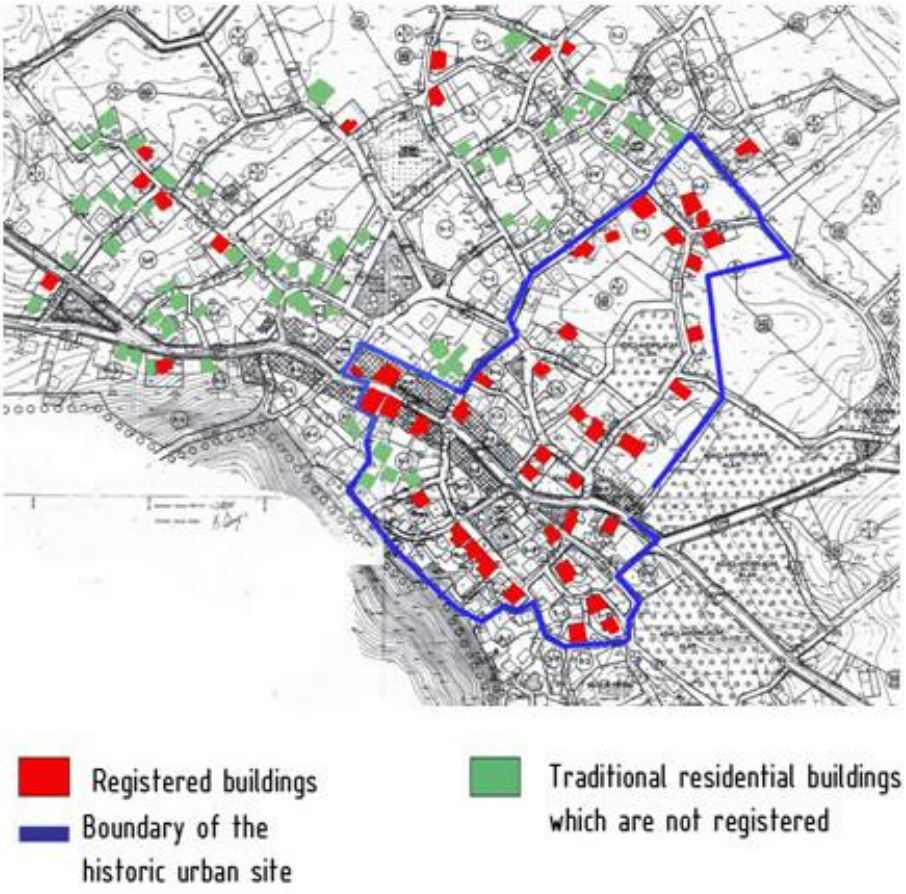

Figure 1. Map of the Historic Urban Site of Ormana (Çelik, 2009)

Spaces, which constitute Ormana houses, are positioned according to their functions. Manners of life and means of living in the region have reverberated to constitution of housing scheme and became a determinant in quantity of floors in the houses and plan schemes. Structures are generally two floored and in the first floor generally service spaces are situated such as; shops, storages, barns, haylofts. Rooms and anteroom where are the spaces in which the eating, living, sleeping actions are performed take place in the upper floor (Figure 2).

Traditional Ormana houses were built with rubble stone masonry framing with timber construction system that mainly consists of three sections according to the characteristics of the construction technique and the material. These three sections are foundations and the masonry section that forms the ground floor and upper floor, the timber-framed part of upper section and the roof structure. In some of the upper floor interior walls, projections, and in some ground floor interior walls, timber skeleton system is used.

Figure 2. Examples of Traditional Ormana Houses (Çelik, 2009)

Kavas and Çelik (2012) disclose that the Akseki-İbradı basin (Antalya, Turkey) is situated in southwestern Anatolia at the transitional geographical band between the Mediterranean coast and inland Anatolia. The Taurus Mountain chain passes through the basin. In this mountainous topography architecture has become the means for survival. Local architecture reveals how the available material sources have guided the emergence of a characteristic construction technique. This is a specific and unique combination of timber and rubble stone masonry. The traditional settlements of the region are fabricated through the reproduction of an essential structural principle underlying this construction technique. Traditional walling techniques used in Ormana houses are given in detail in the following sections.

2. FOUNDATIONS

Information regarding the foundations of traditional houses in Ormana is very scarce. According to the interview of the inhabitants and craftsman, in Ormana, since the area has a comparatively rough and rocky character, inhabitants prefer rocky zones to build house for to gain more field of agriculture. The foundations that can be observed clearly in the area can be classified in two categories according to their structural and material characteristics.

First type of foundation (Type A), rocky zone is used as a foundation of the buildings. The ground floor walls are built up on top of the rock; these rocks are used as a part of the main structural system. Walls corresponding to these rocks were constructed directly on them and the connection between the superstructure and rock is made without any joint (Figure 3 and Figure 4).

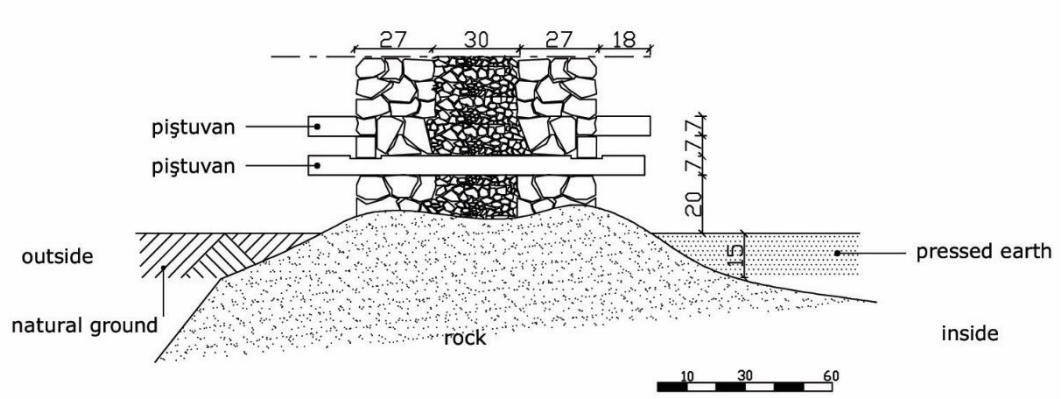

Figure 3. Drawing of the Foundation Type A (Çelik 2009)

Figure 4. Foundation of the Buildings (Çelik, 2009)

Second type of the foundation (Type B), is a rubble stone masonry. It is applied under the stone ground floor walls where the ground is not homogeneous and it continues underneath the walls following the external contours of the structure so the foundation can be called as *continues foundation*. The foundation is extended 40-50 cm inside the earth but the depth of the foundation depends on the characteristics of the land. In some cases, it becomes necessary to go deeper for the foundations in order to reach adequate soil layer. The stone masonry base continues until the beginning of the ground floor level either as stone. The connection between the superstructure and foundation is made without any joint.

No use of timber was seen at foundation walls during the site survey, but according to interviews, (Figure 5) in some structures, wall proceeds under the ground likewise and in the parts where the wall works as a fundament, utilization of timber continues.

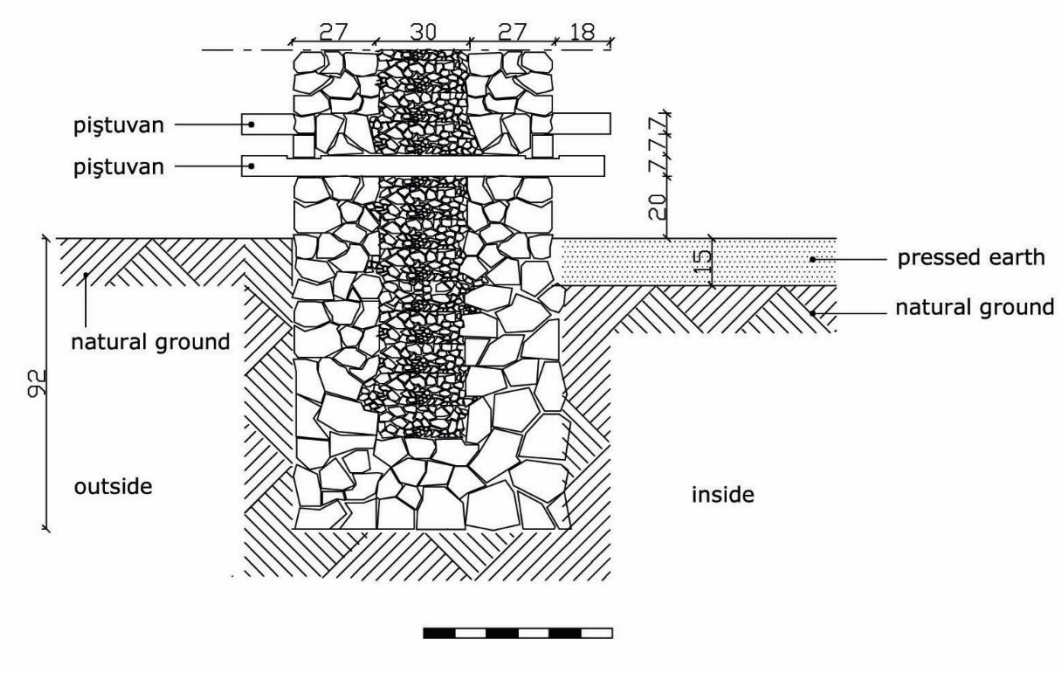

Figure 5. Drawing of the Foundation Type B (Çelik 2009)

3. WALLS

The masonry walls used in Ormana traditional houses mainly can be defined as the composion of timber and irregular units of rubble stone interlocked into each without mortar. Almost all constructions ranging between the simple retaining walls to the masonry of the buildings, share the basic joint style between timber and stone.

In the so called *"düğmeli duvar"* the walls are constructed with alternating rows of rubble stone and timber beams which are called "pištuvan" by the local people. These walls are 60-80 cm. thick, a double skin wall construction, is used where timber bond beams are placed horizontally at every 30-35 cm in two directions for the reinforcement of these double skin walls. Each row is called as *destur*. Outer parts at both sides of the walls that are constructed with bigger rubble stone blocks are 30 cm to 35 cm in size. Interior part of the wall is made of small rubble stone pieces called *helik* and these parts of the wall are 20 cm to 25 cm in size (Figure 6).

Figure 6. Düğmeli Duvar- Buttoned Wall (Çelik 2008)

The timber beams which are used at short dimension of the wall called as pistuvan. *Pistuvan*s have square section, the cross section of the pistuvan's also changes from 7x7 to 8x8cm, and their length is 104 cm-110 cm. These timber elements are projected 12-15 cm from the both exterior and interior surfaces of the wall and placed under the timber bond beams. Also they are located with 80 cm-to 200 cm distance from each other. There is no mortar and plaster used in walls (Figure 7).

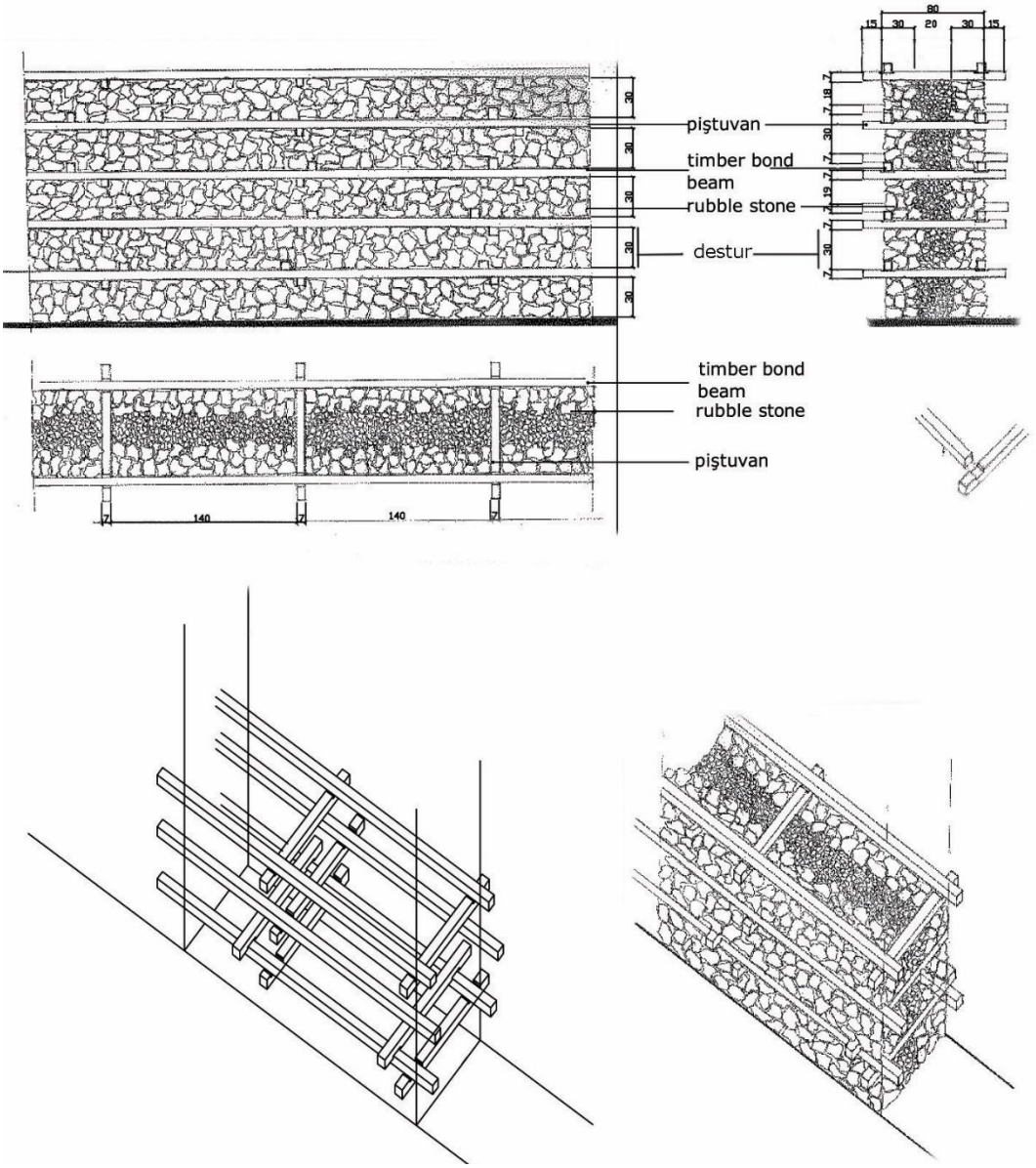

Figure 7. Details of the Walls (Çelik 2009)

Timber beams, which are used through the thickness of the wall, the so-called "pişţuvan", are used for scaffolding during construction. The timber bond beams and tie-beams are made by using cedar. These traditional construction technique has the capacity to produce structures of considerable heights (Figure 8).

If it is necessary to leave openings on the walls, first the timber elements are inserted at the sides of the openings, and then the framework of the openings is fixed at the edges. Timber lintels are five or six in number, which are placed throughout the thickness of the wall. These lintels with a cross section of 7x7 cm. are placed as spanning elements at the top of the opening; their undersides are covered with timber boards (Figure 9).

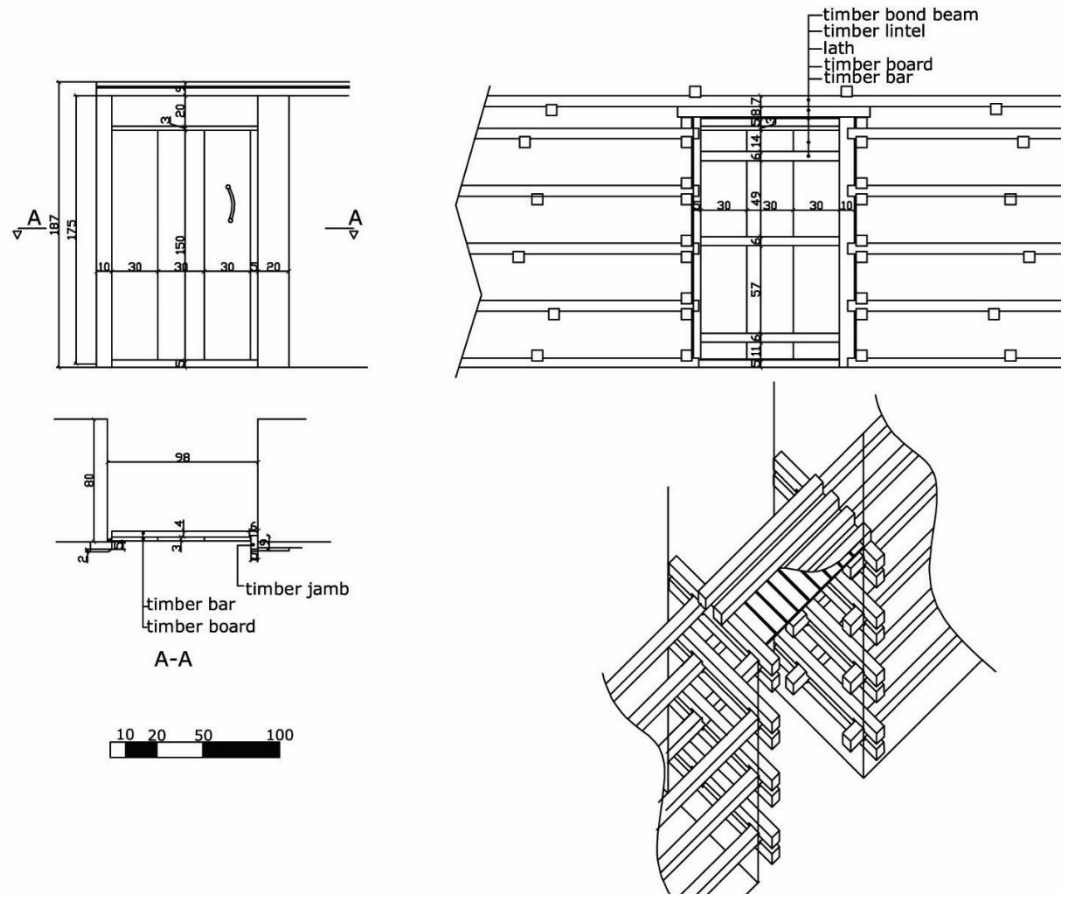

Figure 8. Drawing of the Opening Construction (Çelik 2009)

Although grout isn't used on the walls, it is seen that, inner walls of the living spaces and the interior of the outer walls are plastered with mud plaster. Furthermore, in the interior spaces, timber pieces that are called ‘‘pişţuvan’’ are cut in the level of masonry part and covered with mud plaster. In some examples, outer walls are covered with timber laths (Figure 9).

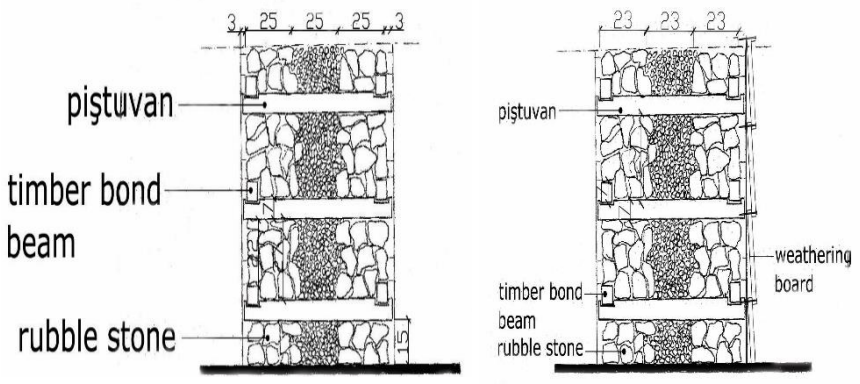

Figure 9. Drawing of the Walls with Covering Material (Çelik 2009)

4. CONCLUSIONS

It is clear that Anatolia has different construction technique traditions developed according to regional features and materials. And from these traditions, contemporary construction industry can still learn many things to solve modern - regional and specific - construction problems. However, the vernacular architectural tradition was substantially conserved until the mid-20th century, alteration and transformation have started after the last quarter of the same century. Main reason for this is proliferation of civilized construction techniques and materials and various socio-economic developments.

As Erbaş (2013) states that, with not only the cultural structure, but also the traditional buttoned houses (düğmeli ev), Akseki-İbradi Basin is about to lose its current fabric as a result of unconscious structuring and unconscious user applications. Similarities between the applications caused by the similar reasons and the commonness of the applications prove that, community in the region take each other as an example while solving the structural problems. So-called "improvements" realized based on such negative examples, contrary to popular belief, unqualify the structures. Concurrently, these unconscious applications that spread like an epidemic illness shorten the life of the structures.

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