CONSTRUCTION TECHNIQUES OF FOUR TRADITIONAL ORMANA HOUSES

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submitted by **GÜLŞAH ÇELİK** in partial fulfillment of the requirements for the degree of **Master of Science in Restoration, Middle East Technical University** by,

Prof. Dr. Canan Özgen _____
Dean, Graduate School of **Natural and Applied Sciences**

Assoc. Prof. Dr. Güven Arif Sargın _____
Head of Department, **Architecture**

Inst.Dr. Fuat Gökçe _____
Supervisor, **Architecture Dept., METU**

Examining Committee Members:

Assoc. Prof. Dr. Gül Asatekin _____
Architecture Dept., METU

Inst. Dr. Fuat Gökçe _____
Architecture Dept., METU

Prof. Dr. Can Hersek _____
Architecture Dept., BAŞKENT U.

Prof. Dr. Zuhal Özcan _____
Architecture Dept., BAŞKENT U.

Inst. Dr. Nimet Özgönül _____
Architecture Dept., METU

Date: __25/05/2009___

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last name: Gülşah Çelik

Signature:

ABSTRACT

CONSTRUCTION TECHNIQUES OF FOUR TRADITIONAL ORMANA HOUSES

Çelik, Gülşah
M.S. in Restoration, Department of Architecture
Supervisor: Inst. Dr. Fuat Gökçe

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The subject of the thesis is construction techniques of four traditional Ormana Houses within the wider context of Akseki Region vernacular architecture.

The thesis analyses the appropriate methodology and approach for a documentation of construction techniques and details of the traditional houses. As such, it includes the necessary research and analysis that would provide the base for coherent restoration principles and decisions.

The thesis includes the historical background of Ormana, detailed description of the present state details of the houses supported by survey drawings, photographs and visual analysis of the traditional Ormana Houses.
Keywords: Construction technique, Traditional Houses, Ormana Houses.

ÖZ

GELENEKSEL DÖRT ORMANA EVİNİN YAPIM TEKNİKLERİ

Çelik, Gülşah
Yüksek Lisans, Restorasyon, Mimarlık Bölümü
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Bu çalışmanın konusu Ormana beldesi geleneksel konut mimarisi bağlamında dört Ormana evinin yapım teknikleridir. Yapıların sahip olduğu mimari ve tarihsel değer göz önünde tutularak tutarlı bir yapım teknikleri detaylarının belgelenmesi ve tanımlanması için uygun yaklaşım ve yöntem araştırılmıştır.

Tez kapsamında Ormana Beldesinin tarihi araştırması, yapıların halihazırdaki durumlarının yapım teknikleri açısından çizim ve fotograf ve görsel analizlerle desteklenerek ayrıntılı belgelenmesi ve detayların Ormana beldesinin konutları ile karşılaştırmalı olarak incelenmesi yapılmıştır.

Anahtar kelimeler: Yapım tekniği, Geleneksel konut, Ormana evleri.

To my parents...

Hayatımda güzel olan her şeyi borçlu olduğum
Annem Durna Çelik
ve
Babam Ali Çelik'e...

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CHAPTER 1

INTRODUCTION

1.1. DEFINITION OF THE PROBLEM

The historic built environment is frequently tangible evidence of history, and historic structures can open new doors for understanding the past.[1]

"Since vernacular architecture is the product of a wide range of environmental, functional, social and cultural factors relevant at a given period, a vernacular house becomes the reflection of the spirit of an age by expressing the combined effect of these factors on a way of life. The study of the evolution of a vernacular type is instrument to understanding the real significance of historical developments." [2]

Similarly, 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

[1] "Recording Historic Structures". Edited by A. John Burns and National Park Service. New Jersey: John Wiley & Sons Inc., 2004, p. 6.
[2] A. R. Fuchs and M. Meyer-Brodnitz. "The Emergence of the Central Hall House-Type in the Context of 19th Palestine". In Dwellings, Settlements and Traditions: Cross-Cultural Perspectives. Edited by J. P. Bourdier and N. Alsayyad. USA and England: University Press of America, 1989, pg. 419.

tradition developed by the immense variety of the regional, local and national techniques.

Today, traditional dwellings which are one of the most important evidences of cultural variety have survived in most of the Anatolian settlements. The dwellings, influenced by the differing lifestyles, have gone under transformations due to the changing social and cultural structure. Therefore, the documentation of the characteristics of these traditional dwellings becomes a necessity for their preservation.

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 uses 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 even within a few distances in 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.

Ormana is a historic settlement located on the western part of the Mediterranean Region and it is situated 850 m. above sea level to the West Taurus Mountains. Several examples of traditional dwellings are found in Ormana which represent the specific characteristics of the

vernacular architecture of the region. However, the traditional dwellings dating to the late Ottoman Period are widely affected by urban developments, natural disasters like fire (1915, 1929 fires) as well as changing requirements and negligence. Nevertheless, there are no detailed researches on the traditional Ormana dwellings and the documentation of these traditional dwellings becomes a requirement for the understanding and preservation for future generations.

It is stated in Article 2 of the Council of Europe's Convention for the Protection of the Architectural Heritage of Europe (Granada, 1985) that:
For the purpose of precise identification of the monuments, groups of buildings and sites to be protected, each Party undertakes to maintain inventories and in the event of threats to the properties concerned, to prepare appropriate documentation at the earliest opportunity.[3]

According to LeBlanc and Eppich, although we should strive to preserve as much as possible of our architectural and archaeological cultural heritage, we cannot save everything. One option can be to document heritage before it is lost. A permanent record will transmit knowledge of these places and architecture to future generations. Equally important, documentation is the thread that runs through the entire process of cultural heritage conservation. Indeed, documentation can help keeping heritage from being destroyed or forgotten and it serves to transmit information, not only to conservation professionals but to the public at large, the character, value, and significance of the heritage. [4]

[3] "Core Data Index to Historic Buildings and Monuments of the Architectural Heritage". Retrieved on June, 2008 from http://www.object-id.com/heritage/intro3.html
[4] François LeBlanc and Rand Eppich. "Documenting Our Past for the Future". Conservation Institute Home, Newsletter 20.3, Fall 2005.

Documentation is a process of compilation or collecting information, both graphic and written records that explain and illustrate the significant characteristics, physical configuration and condition of a historic building, site, structure, or object. It is also called "recording" in certain contexts.[5]

In the words of Adam Menuge records of historic buildings are generally compiled for one or more of the following reasons: [6]

- to promote the understanding and appreciation of historic buildings, individually and collectively;
- to inform the day-to-day and long-term management and use of individual buildings;
- to secure an understanding of a building and its significance sufficient to inform the preparation of a scheme of conservation, repair or alteration, or decisions relating to such a scheme as part of the planning or conservation process;
- to document buildings, or parts of buildings, which may be lost as a result of demolition, alteration or neglect;
- to assess the significance of groups of buildings, settlements and landscapes, and provide a basis for strategic heritage management;
- to provide underpinning data for thematic, topographic or period-specific works of synthesis by recording a sample of surviving structures;
- to inform academic research across a range of disciplines;
- To deposit a permanent record in an established archive.

[5] Divay Gupta. "Identification and Documentation of Built Heritage in India". New Delhi: INTACH, 2007, p. 12. Retrieved on June, 2008 from http://cipa.icomos.org/fileadmin/RECORDIM/INDIA_2007.pdf.
[6] Adam Menuge. "Understanding Historic Buildings A guide to good recording practice". English Heritage, 2006.

It can be understood from the reasons stated above that; documentation is the basis of any conservation process. In order to conserve the historic buildings with their properties and original meanings, it is fundamental to record all their details. Therefore, the documentation of the construction techniques of the traditional dwellings in Anatolia that are subjected to loose becomes essential. Thus, this study intends to examine the traditional construction technologies in regard to Ormana houses.

Therefore, it is beneficial to analyze and record the construction techniques of the traditional dwellings as construction systems and architectural elements. However, recent documentation criteria, methodologies, approaches and definitions are insufficient to clarify and define the construction techniques of traditional buildings. Specifically there is not a standard or a guide for the documentation of construction techniques of buildings and details of architectural elements. Thus, this study becomes also important for the identification and documentation of the construction techniques of the traditional dwellings of Ormana especially those dwellings are not yet studied.

1.2. AIM AND SCOPE OF THE RESEARCH

The thesis focuses on the vernacular traditional dwellings in Ormana, which is a town in the southern part of Anatolia from the 19th century with a special emphasis on their construction techniques. The study aims to be a guide or a reference work on construction techniques of traditional Ormana dwellings and a methodology for the collection and documentation of construction details of historic buildings.

The objectives of the case study are to define, understand and document the construction techniques of the architectural and structural elements of the traditional dwellings in Ormana and to evaluate, with reference to other written sources on construction techniques, the traditional residential buildings. Furthermore, another objective of this study is to design a data sheet that can guide the researchers to collect efficient data from the traditional buildings while studying the construction details. The achievement and the reliability of this research depend on the absolute and accurate approach to the documentation method of construction details. Although the main objective of this study is the documentation and evaluation of construction techniques of Ormana houses; to achieve efficient information on these techniques, the problems related to the methodology of documentation of construction techniques of the historic buildings should also be identified.

1.3. FRAME OF THE STUDY

The thesis consists of documentation and evaluation of construction systems of traditional Ormana houses. Measured survey drawings are prepared, analysis of the construction techniques and materials of the selected buildings are recorded. Moreover their properties are defined and classified according to their functional use and construction techniques in order to conceive how these dwellings are constructed. Although the study area is limited to Ormana, the entire settlement including all the traditional dwellings of the town is not studied. Instead, four traditional dwellings which are the representative examples of architectural characteristics of Ormana houses were selected and studied in detail to understand their construction techniques.. In addition, the settlements in the vicinity of Ormana are also studied in order to make a comparative study between them and

the dwellings in Ormana. Furthermore, to evaluate the continuity of the traditional construction techniques of the region and to constitute a historical background for the study; written and illustrated documents such pictures, map are also studied.

1.4. SELECTION OF THE STUDY AREA AND BUILDINGS

The reason for the selection of the traditional residential buildings of Ormana is; there are not any detailed research studies on the construction techniques of these buildings, dating to the late Ottoman Period, which represents all specific characteristics of the vernacular architecture of Akseki region. Moreover, this historic settlement in the Mediterranean region is selected because of its location, environmental texture that still preserves its traditional character but it is also subjected to problems by the increase of recently scheduled touristic activities.

In the light of the aim mentioned above, the study is focusing on traditional dwellings among four, three of them are registered. The selection of buildings in Ormana is mostly for reasons such as;

- Selected buildings are classic examples of traditional Ormana dwellings with their scale, construction technique, architectural elements, and use of material, plan and façade layout.
- All the selected buildings were designed originally as a residential building and before they are abandoned, they have been used as residences for a long time.
- All the selected buildings are not undergone through restorations. Therefore, they still preserve their original construction details.

- Gümüşler House and Eyüpoğlu House are selected since they are poor in condition and it is possible to observe their construction techniques clearly.
- Gürsoy House is selected since it is in good condition and provides the analysis of how architectural elements work.
- "Municipality's Guest House" is selected since the building has measured plan and section drawings. In order to achieve effective detailed drawings of architectural elements of Guest House, these documents can be used as base maps.
- All the selected buildings are not in use so it makes the survey easily held during the site survey.

1.5. METHODOLOGY OF THE STUDY

The methodology of the study includes the historical survey, site survey, graphical documentation and measured drawings for the survey study, analysis on construction techniques of the structural system and architectural elements as the analysis stage, followed by the evaluation respectively.

1.5.1. SURVEY STAGE

1.5.1.1. Historical Survey

Historical research basically consists of two themes; the history of Ormana and the history of the region. There is no direct information on the selected houses. Information on the history of Ormana and the surrounding settlements is derived from written sources and especially articles on Ormana, as well as the books and theses written on the regions of Akseki, İbradi.

1.5.1.2. Site Survey

The site surveys in the town are conducted in two stages. A general preliminary survey was held in May 2007. At this pre-survey, the texture of the whole town and the historic settlement is studied and the traditional buildings are marked on the base map as well as a photographic documentation and the detailed site survey stage was conducted in August 2007.

All the detailed survey studies including the preparation of sketches and measurements of the three selected buildings are carried by the author. The plans, sections, elevations of the fourth building which is "Municipality's Guest House" is obtained from the restoration project prepared by Necat Üreğen Architecture Office and *Antalya Mimarlar Odası, whe*reas the detail measured drawings of the architectural elements and construction details are produced by author based on these drawings.

Plans, elevations, system sections, detail drawings are prepared as sketches during the site survey. The measurements are taken using conventional techniques with tape measure. Information related to the plans, sections and architectural elements are produced by different scale sketches. However, some spaces or points of the buildings could not be drawn and measured due to the reasons like, unsafe floors, roofs or locked doors.

The sketches of the plans are produced and measured in a detail of 1/100 scale. Sketches of architectural elements, details and system sections are produced as in detail of 1/1, 1/5, 1/10, 1/20 scale according to their dimensions and complexity. In addition for the architectural elements having similar details, one of them are drawn

and measured, and others are indicated on the plan drawings. Besides, for the elevations, control measurements and photographs are taken in order to be utilized for digital photogrammetry.

During the site survey apart from the drawings, a detailed photographic documentation of the buildings is also prepared. For the photographic documentation, digital photographs are taken by Canon IXUS 750 digital camera. In the interior spaces photographs are taken with a clockwise order and the general view of architectural elements is first taken and then detailed photographs are taken to obtain more information on their construction techniques. After the completion of the photographic documentation, photographs are grouped.

1.5.1.3. Graphical Documentation and Measured Drawings

The final drawings are produced by the author in computer media using AutoCAD program. The preparations of these materials are based on the measured drawings of the buildings. In the measured drawings, the measurements taken by the conventional technique and the ones derived from the sketches that are not measured are differentiated. Plan, facade and section drawings are prepared in 1/50 scale. To achieve effective information, detail drawings of architectural elements are drawn in 1/20, 1/10, 1/5, 1/1 scale according to the detail they require. All the spaces and the architectural elements are coded for comprehension and avoid any confusion for their identification.

The drawings and rendering of the facades are made prepared by using single image digital photogrammetry program called “MSR”. The rectified photographs are then transferred to AutoCAD and by the

control measurements the rendering is made by tracing directly from the rectified photographs.

After the completion of the plan, façade and detail drawings, plan and façade drawings are used as key maps to define the location of the detail drawings as well as coloring for their identification and analysis.

1.5.2. ANALYSIS STAGE

The methods of analysis depend on the documents of site survey, literature survey of the available sources, observations, interviews and discussions with the inhabitants.

1.5.2.1. Analysis on Construction Techniques of Structural System

After the completion of the documentation, information related to the construction techniques of the structural system are determined with scaled detail drawings including descriptive information, photographs, 3D perspective drawings related to the construction material.
This information is given with scaled drawings, photographs and 3D illustrations. After the completion of measured drawings the structural elements are grouped as follows:

- Walls
    - Wall bonding techniques
    - Corner details walls
    - Connection details of the walls with architectural elements
    - Connection details of the walls with foundations
    - The construction units and their dimensions
    - Connection details of the walls with floors

    - Connection details of the walls with roof structure
    - Connection details of the walls with projections
- Floors
    - Materials, dimensions and connection details
- Roof Structure
    - Materials and connection details

1.5.2.2. Analysis on Construction Materials and Techniques of Architectural Elements

In the analysis on construction materials and techniques stage, information related to the construction techniques of the architectural elements are determined with scaled detail drawings including descriptive information, photographs, 3D perspective drawings related to the construction material. After the completion of the drawings the architectural elements are categorized as follows:

- Exterior Doors
- Projections
- Interior Doors
- Windows
- Stairs
- Fireplaces

Like the structural system, different types of architectural elements are also mapped on the scaled drawings.

1.5.3. EVALUATION and CONCLUSION STAGE

In this stage, the characteristics of Ormana houses in terms of their construction techniques are evaluated in the light of the analysis held

in Ormana together with comparison of them. Also, dwellings are evaluated in comparison with other examples of civil architecture in Ormana which are the examples from the nearby environment built in similar period with the studied houses.
In addition in the conclusion, the identification of the construction techniques of Ormana houses will be an initial stage for the conservation of the traditional dwellings in Ormana as well as a guideline for restoration projects.

1.6. SOURCES AND LIMITATIONS

Mainly three types of sources are used in this study which are the data obtained from the site survey, written sources and interviews with inhabitants respectively.

During the site survey, the information about the general architectural characteristics of the dwellings as plan layout, façade arrangements, architectural elements construction techniques and materials are collected.
The written sources utilized may be classified as follows:

- Administrative sources obtained from governmental bodies such as maps, registration cards, and restoration projects of the selected traditional dwelling. These sources are obtained mainly from the archives of the regional conservation council, and the municipality of Ormana.
- Researches by several specialists on Ormana and Antalya region, including its history, development, as well as the architectural features of traditional buildings. In this context published books and unpublished theses are utilized.

- Researches carried out by various experts on traditional dwellings in Anatolia to reveal their original architectural characteristics and construction techniques. Especially the traditional dwellings in the regions of the Mediterranean and in the Akseki and İbradı focused with special concern to the characteristics of the dwellings.

The first limitation was transport and accommodation difficulties to the town. Accommodation facility is limited to a single room which belongs to Ormana Kalkındırma ve Yardımlaşma Derneği. The second limitation is the seasonal use of the dwellings. A great number of inhabitants use their dwellings as seasonal house for a short time, and many of the dwellings are usually locked whole year. The third limitation is the lack of information especially on the history of Ormana, therefore among the sources written about the history of nearby surrounding of Ormana has been studied.

CHAPTER 2

HISTORICAL BACKROUND AND LOCATION OF ORMANA

2.1. GEOGRAPHICAL PROPERTIES OF ORMANA

Ormana is one of the towns of Antalya. Ormana is located on the western part of the Mediterranean Region and it is situated 850 m. above sea level on the West Taurus Mountains.

Figure 2. 1 The Map of Turkey that shows the location of Antalya. Retrieved on July 2008 from www.antalyaportal.com.

Figure 2.2 The Map of Antalya in Turkey. Retrieved on July 2008 from www.antalyaportal.com.

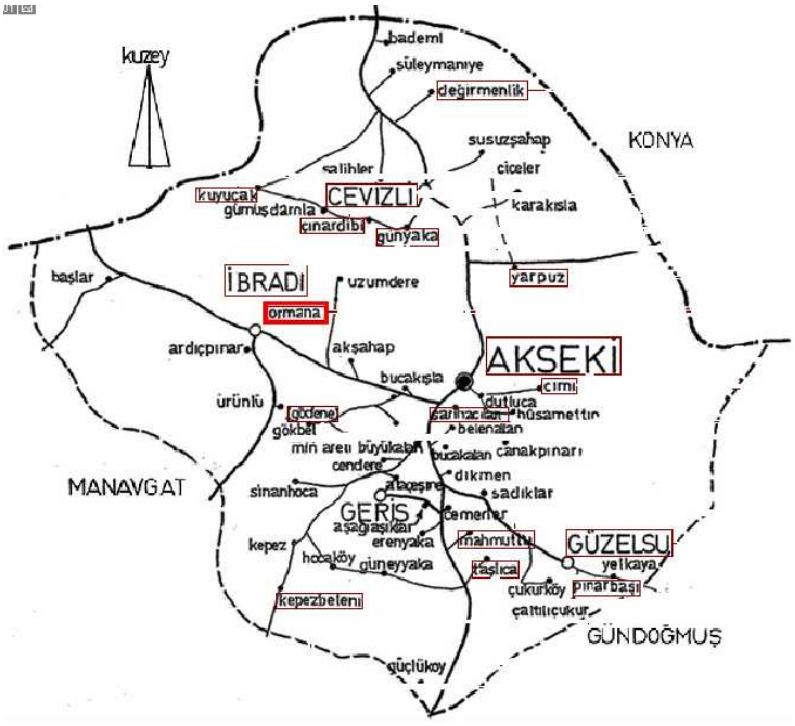


Figure 2. 3 The Map that shows the location of Akseki and İbradı. Didem Şimşek. "Antalya Ürünlü Köyü İle Konut Mimarisi Üzerine Bir Araştırma". Unpublished Master Thesis. İstanbul: Yıldız Teknik Üniversitesi, 2007.

Ormana is located 3 km from İbradı, 30km from Akseki and 155 km from Antalya. The town is surrounded by Eynif Savanna on the northwest, Gembos Savanna on the north, Karadağ on the west, Elmacık Mountain on the east. Ormana also has two plateaus namely Eynif and Söğüt. Although Ormana is located between West Taurus Mountains and is located at temperate climate belt. The effects of the Central Anatolia climate which come through north winds can be felt here. Temperature range is around 30 degrees Celsius in the summer daytimes and 10 degrees Celsius in the nights in Ormana.

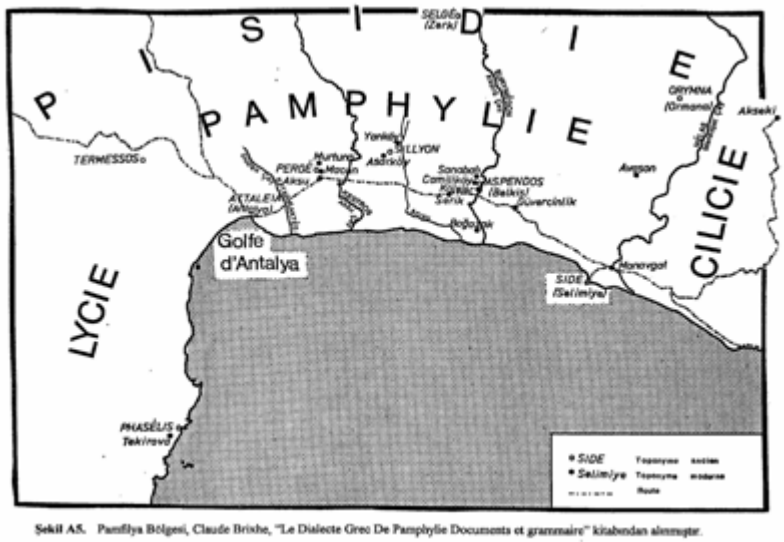
The flora of Ormana is formed with spruce, huile de cade, oak, pine. Aluminum, mercury, chrome and manganese deposits are existed in the region.

Altınbeşik Cave which is the second biggest underground lake of the world is located on northeast of Ormana and it is a very important feature for the potential of tourism.

2.2. HISTORICAL DEVELOPMENT OF THE REGION AND ORMANA

Akseki district is situated on the hilly region near antique Melas River. Marulye is the old name of the Akseki district. The etymology of Marulye is not known certainly but it is thought that 'Mero' was a word which was used during the Roman period.[7] Akseki region was under several rules through history. The major ones are the Hattis, Hittites, Lycians, Psidians, Lyconians, Pamphylians, Isaurians, Helens, Romans, Seljukids and Ottomans.

[7] "Antalya". Yurt Ansiklopedisi. İstanbul: Anadolu Yayıncılık, 1981, Volume 2, pg. 748.



Şekil A5. Pamfilya Bölgesi, Claude Brixhe, "Le Dialecte Grec De Pamphylie Documents et grammaire" kitabından alınmıştır.

Figure 2. 4 The area of Pamphylie. Claude Brixhe. "La Dialecta Grec De Pamphylie Documents et grammaire".

In antiquity Akseki region was the intersection of different regions such as, Isauria on the east, Psidia on the west, Lyconia on the north and Pamphylia on the south.

The map below shows the ancient settlements and the existence of three important city states are mentioned, which are Etenna (İvgal), Gıtebba (Gödene), Erymna. These states were connected to Side and they were using the harbor of Side.

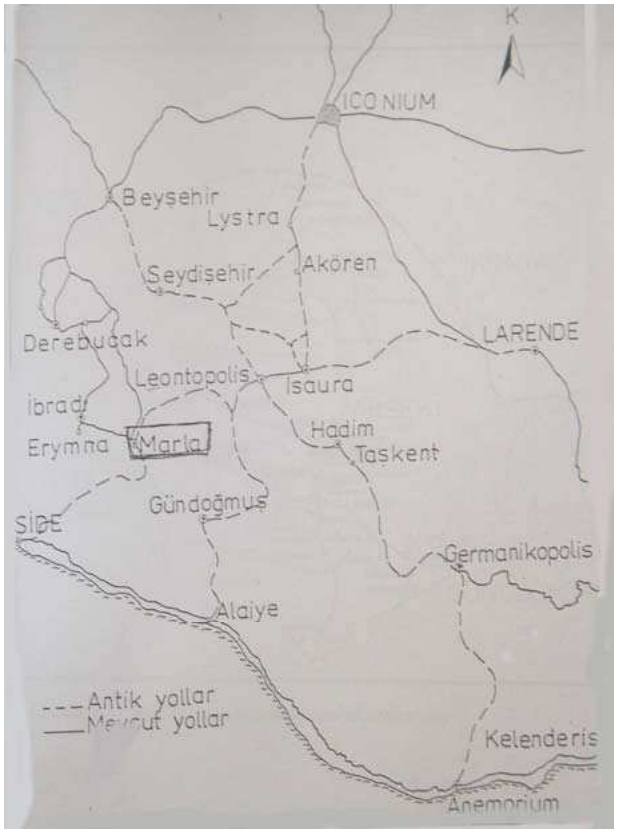


Figure 2. 5 Ancient-era settlements studied in this thesis. Osman Kunduracı. "Batı Toroslarda Bulunan Geleneksel Konutlar". Unpublished Phd Thesis. Konya: Selçuk Üniversitesi, 1995.

After Alexander's campaign in 329 BC, Side, Akseki and Perge started to be ruled by Macedonian commanders. After the Persian invasion between 323-312 BC, these cities were controlled by the Persians.

It is known that Arabian navy started to dominate the region in 9th century. Side and Akseki regions fought together against Arabs; but Arab attacks affected Erimna, Gotenna and Etanna. [8]

During this period, the citizens from the coastal cities migrated to Akseki region in order to avoid Arab attacks and malaria. The

[8] Ibid., pg. 748.

population shift within Akseki region continued during the Seljukid, Karaman and Ottoman periods. After the separation of the Roman Empire, Egyptians and the king of Cyprus Piyer tried to dominate the region for the need of lumber. In the first quarter of the 12th century, Seljukids gain power in Akseki region. When Seljukids started to loose their power, Karamanoğlu Mehmed Bey took the region into his territory. The use of the coins with the name of Olcayto Han in Antalya is shows the Ilhanlı's dominance around the region in 1316.

During Anatolian Principalities period, it was known that Akseki which was annexed to Karamanoğulları Principality has a secondary role compared to the other regions of the principality. After the continuous incursions of the region between Karamanoğulları and Ottomans, Akseki together with Alanya was annexed to Ottomans by Gedik Mehmet Paşa in 1471. [9]

In the Ottoman period, Antalya was annexed to Konya province, Konya province was separated into 5 regions, which are;

Antalya: Korkuteli, Serik Mili, Kızılkaya
Elmalı: Finike
Alanya: Manavgat, Düşenbih
Akseki: İbradı
Kaş

After separating from Konya, Teke region became an independent province by the declaration of the administrative center. The region

[9] Ibid., pg. 748.

whose capital is Antalya is separated into 10 districts; one of them is the district of Akseki with 21 sub-districts. [10]

The administration changed as a result of the reforms started in 1871; Akseki was separated from Alaiye province. In these years, it is said that almost half of the Akseki population were non- Muslims. Kemal Özkaynak who wrote a book named Akseki district, mentions occupational designations like *taşçıcayan, okçuyan, bıçkıcıyan* by the help of cadastral documents indicating an Armenian community in the region.[11] After the separation of Teke banner in 1913 from Konya, Teke became an independent province and many villages have been taken from sub-distriction of Akseki resulted the narrowing of Akseki's border. In early times of the Turkish Republic, İbradi, was a centre of sub- distriction, became a district in 20.05.1990.

İbradi is situated on a hilly region near the waterfall of Manavgat (antique Melas) river that is located 166 kilometers from the east of Antalya and 27 kilometers from west of Akseki district. There are a lot of remains from the Roman period in Ormana and Erymna 3 kilometers to the district's centre and southerly Cotenna (Gmdene) and İbradı's quarter, 12km to Çukurviran and Soğukoluk, shows us this region has been settled from antique period.

During Roman period, İbradı and Ormana regions had wide cedar forests and these trees are believed to be a gift from Marcus Antonius to Cleopatra. In antique sources it is emphasized that, this forest area was mostly devastated. In addition, there were also two cities around İbradı dating to antiquity have not been designated yet. Besides, the

[10] Hasan Kırtı. "Colaklı Soylar ve Boylar". Antalya, 2006, pg. 61.
[11] Osman Nuri Yıldırım. "Akseki ve Aksekililik". *Toplumsal Tarih*, İstanbul, May, 2001, pg. 21.

kervansaray (caravanserai) ruins, which are located in the northern part of İbradi from Kesikbel site, reveal that this region was situated on the trade route in the Seljuk period. [12]

It is understood that during the Anatolian principalities period, Akseki, Ibradi and Ormana had important roles between the cities of Karamanoğulları principality. After the foundation of the Ottoman Empire, Hamidoğulları sold Seydişehir and Beyşehir regions to the Ottomans due to the rebellions of the citizens and their weakness against it. As a result, İbradı became a neighboring district of Ottomans. Karamanoğulları repossessed a part of the region taking the advantage of Ottomans preoccupancy with battles in the Balkans. After Murat I's death during the war in Kosovo, Karamanoğulları attacked Ottomans during the reign of Yıldırım Bayezıd but they couldn't succeed and they lost the war around Kütahya.

The defeated army escaped to the hills and woods of İbradı and Akseki regions which resulted with a civilian disorder. The grandchild of the Timur gave this region to Karamanoğulları again. After the attempt of Çelebi Sultan Mehmet to dominate these regions, battle restarted. Karamanoğulları couldn't resist Ottoman pressure and they escaped. After Mehmet II took over the throne, he sent Rum Mehmet Paşa to supress the rebellion of Karamanoğulları. Gedik Ahmet Paşa took the control of Alanya, Aksedi, İbradı regions and the regions were annexed to the Ottoman Empire. İbradi first became a district of Karaman province and after the occupancy of Cyprus, considering their

[12] Berna Başarır. "Akseki, Hacıgüzeller Evi". Unpublished Master Thesis. İstanbul: İstanbul Technical University, 2001, pg. 56.

closeness to the coast, the district together with Akseki was annexed to Cyprus province. [13]

There are not sufficient sources on the history of Ormana. Nihat Özbal states that the population showed a great variety in term of ethnicity and religion before the Byzantine period and in the Byzantine period, the town was controlled by a bishop..

The information obtained from the interview of Prof. Dr. Tarık Minkari with Necati Akyokuş who was a public prosecutor and an historian; the immigrations of the Turkish tribes from the different regions of the Middle East were converged in Iran and the convoy was separated into two. One part went to Hazar Sea that is called the northern route, and the other part went to Iraq via south Mesopotamia route. They migrate to Asia Minor and Europe utilizing this route. The 25 families which are nearly 250 people, who migrate from the south route, demand from Seljuk rulers to settle and found a new city. At that time, the considerations for a new settlement was the ease in defense, good geographical and climatic conditions within the empire's territory. After a pretty long walk, they decided to settle in the location of today's Ormana. There were three Greeks' town where their population too low Gedezora Masat and Ormana. In the course of time they possessed their land by buying from them.[14]

In Seljuk and Ottoman periods, old caravan road starts with Manavgat-Taşağıl first stop the inn of Kargı, second was the inn of Tol in Kesik Beli. Due to these roads arrived at Seydişehir and Beyşehir, furthermore Ormana kept it is importance during that era, due to its

[13] "İbradı İlçesi". Retrieved on November, 2008 from http://members.lycos.co.uk/derebucaklilar/yoremiz_ibradi.html
[14] www.ibradi.bel.tr

location that was over on this road. The footpath which comes from Avas that is stone laid was exist Seljuks and even in Roman era.[15]

When looking the last century of the city that is qualified like a village, with a population of nearly 500 people, there were two major fires until 1992, they were in 1915 and 1929. In 1915 almost 160 houses, mosque and shops were burned.[16] In 1929, 20-30 roomed medrese was burned. [17]

[15] Ali Sümbül. "Evliya Çelebi Gibi Geze Geze Akseki Kazası ve Köyleri". İstanbul, 1989, pg. 101.
[16] Ibid., pg. 101.
[17] Nihat Özbal. "Ormana Evleri". *Sanatsal Mozaik, 1997,* 2:23, pg. 74.

CHAPTER 3

GENERAL ARCHITECTURAL CHARACTERISTICS OF TRADITIONAL ORMANA HOUSES and STUDIED TRADITIONAL ORMANA HOUSES

3.1. GENERAL ARCHITECTURAL CHARACTERISTICS OF TRADITIONAL ORMANA HOUSES

In Ormana, the residences generally have two floors. That the ground floors are used as private workshops, shops and the first floors as living floors. Dwellings are constructed with alternating rows of rubble stone and timber. Some of these walls are constructed with rubble stone without using any mortar. This is called as "dry wall" technique. Only in some of them mortar is used. Timber bond beams are placed in two directions at every 30cm. horizontally for the reinforcement of the wall. Some of these buildings are plastered while some of them are not. In many examples they have projection which is constructed with timber on the main facades of the first floors and some of them have *şahnişin,* which is a projection on the corner of the building and have *ayazlık* (cold rooms which is a timber skeleton projection located on one façade of the building.

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 "historic urban site" in 2005.[18] Some of these traditional buildings are in danger of collapse and some of them are already altered according to the changing requirements of the inhabitants.

Figure 3. 1 Example of the facades traditional Ormana houses Çelik, 2008.

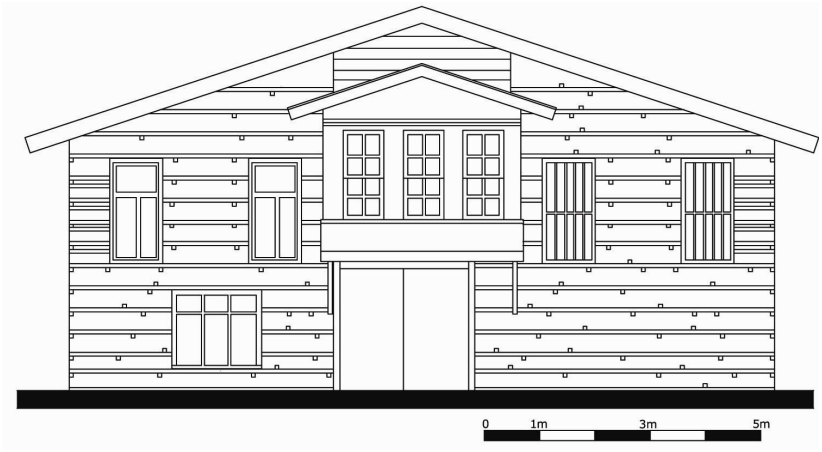
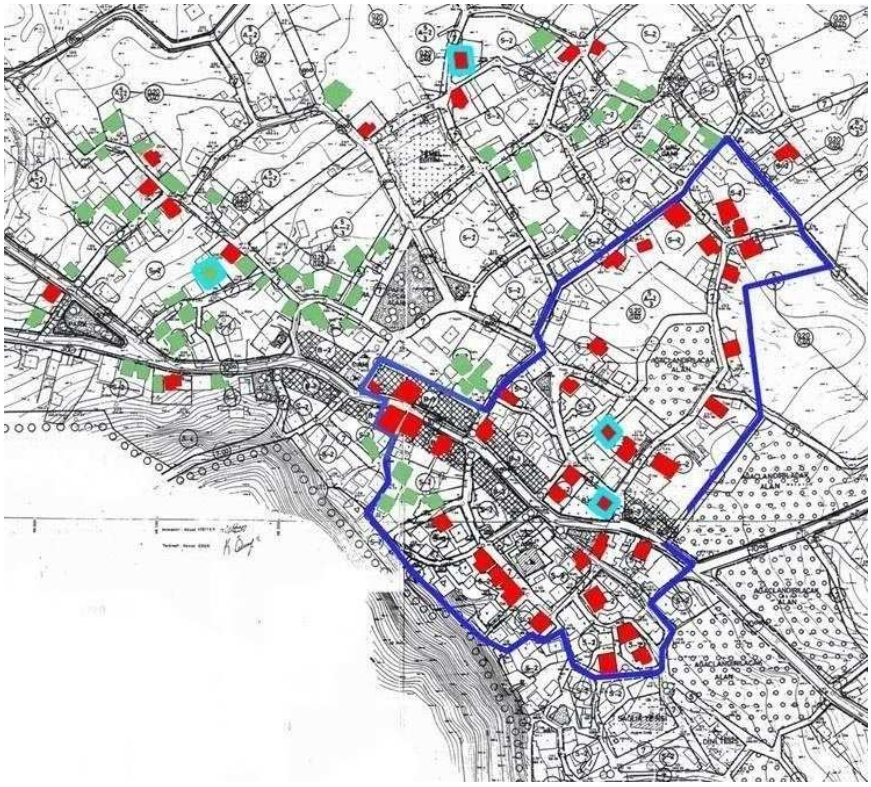


Figure 3. 2 Example of the facades traditional Ormana houses Çelik, 2008.

[18] "Antalya Kültür Envanteri (Akseki-İbradı-Gündoğmuş-Gazipaşa)". İl Özel İdaresi Yayınları, 2005/1, Envanter Dizisi: 6, pg. 38.

Figure 3. 3Example of the facades traditional Ormana houses Çelik, 2008.



Studied traditional houses

1- **Gümüşler House**
2- **Gürsoy House**
3- **Eyüpoğlu house**
4- **Municipality's Guest House**

Figure 3. 4Map of the historic urban site of Ormana

There are more than three hundred traditional Ormana dwellings. Of these four are chosen as a case study; are totally surveyed and sixteen are only externely surveyed in addition four of them are surveyed only as plan organization, use of space and number of storey

documenting by sketching. The drawings of these houses are drawn with the spatial characters. (See Appendix A)

The housesin the Ormana are similar to the ones in Ürünlü and Akseki region in terms of structural system and construction materials. They are mainly stone masonry reinforced by timber beams buildings with or without plastering.

In addition, this technique is a tradition dated back to prehistoric periods in Anatolia. For example in Beycesultan the timber beams were frequently used in Early Bronze Age. In addition similar technique was used.at the wall construction of the Lower Palace of Zincirli.

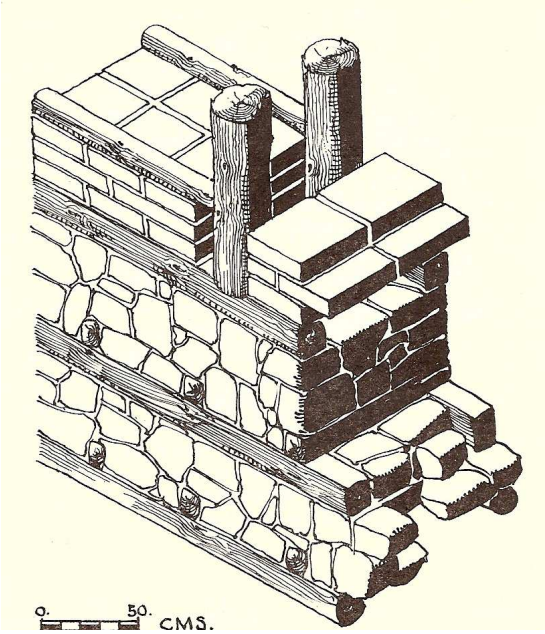


Figure 3. 5 Wall construction of palace of Beycesultan (Naumann, R. 1985)

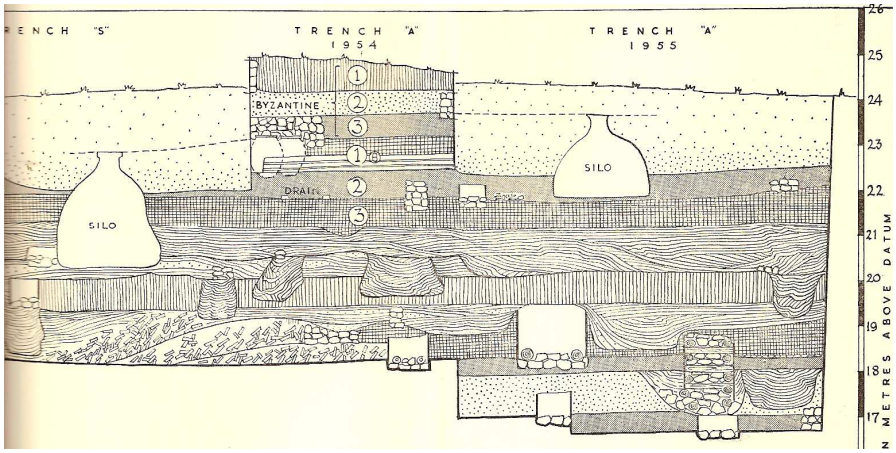


Figure 3. 6 Wall construction of palace of Beycesultan (Seton Lyod, Beycesultan)

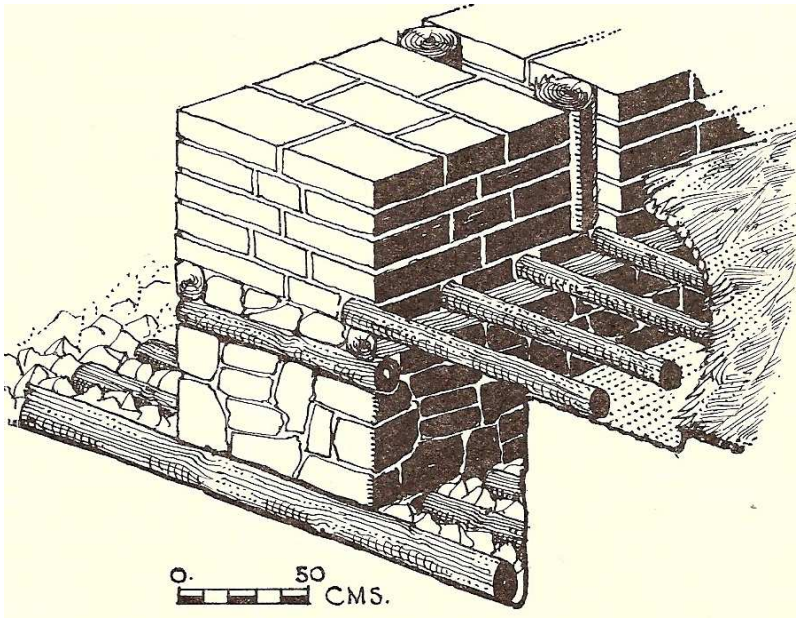


Figure 3. 7 Wall construction of palace of room 31.(Naumann, R. 1985)

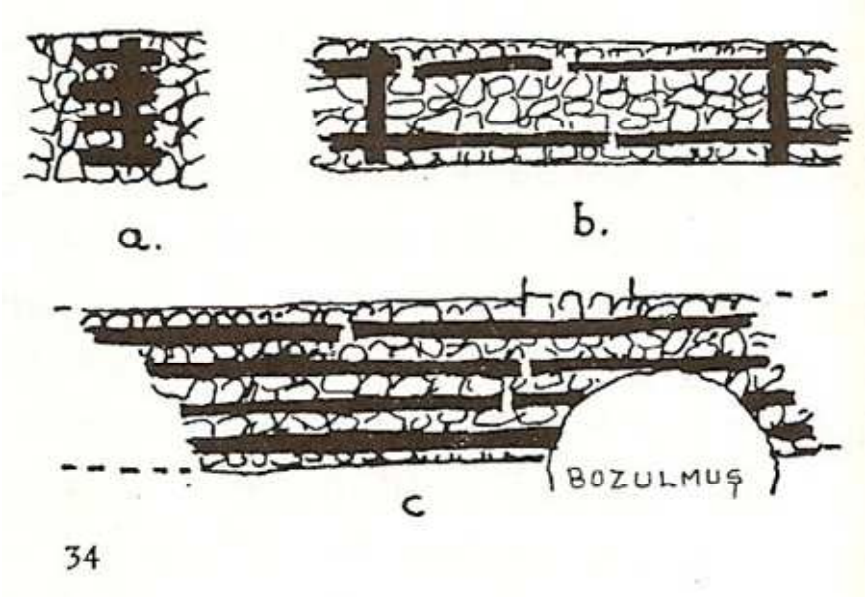


Figure 3. 8 Plan of the wall construction of Beycesultan(Naumann, R. 1985)

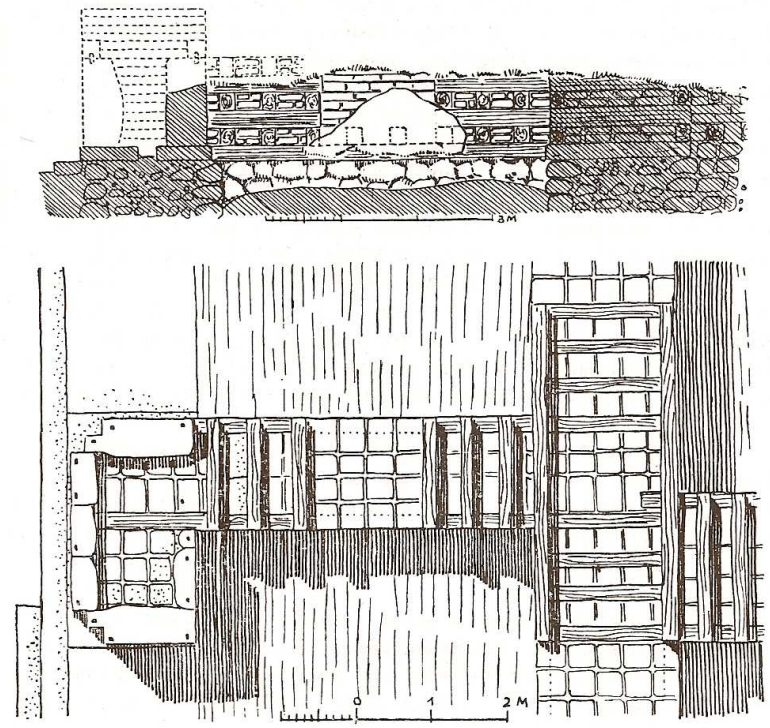


Figure 3. 9Sketches of the wall construction of the Lower Palace of Zincirli.(Naumann, R. 1985)

3.2. CONSTRUCTION MATERIALS OF TRADITIONAL ORMANA HOUSES

Easily available local construction materials that are stone, timber, plaster are used in the traditional Ormana Houses also the materials like glass and iron are used in the buildings. The defination of the common features of the materials used in the Ormana Houses, is the main interest of this study. The analyses on materials that necessitate a multidisciplinary work left beyond the limits of this study, then, the study is based on only on observations.

- **Stone**

Stone is one of the natural materials that are used as it is found in natural in the construction of the traditional houses in Ormana. The stone, which is used as a construction material in traditional Ormana Houses, is taken off from the mountains around the Ormana. As it is an easily available material, it has been used construction of the foundations, walls and pavement of the *taşlıks* in Ormana Houses.
Stone, which is used in Ormana Houses, is a type of serpentine. (H4Mg3Si2O9). Serpentine is a soft stone composed primarily of hydrous magnesium silicate that is basically the same mineral found in talc. It is not tightly consolidated, but a fibrous material that tends to absorb water. [19]

[19] Retrieved on July 2008 from http://www.nps.gov/

Serpentine stone usually green, lustrous, and translucent, but could also be red, yellow, black or white. Serpentine stone takes a high polish but can crack easily.[20]

In the stone masonry walling, the stone pieces a special coursing was not used, the bigger blocks are which are called as *mountain stone* in the region placed at the external faces of the walls while smaller ones are used in the inner section. Small stone pieces that are slim and flat are called as *helik and* they are used as they are found in nature.

- **Timber**

Timber being an easily workable material, utilized in Ormana Houses both for structural and decorative purposes. The forest areas around the Ormana are rich in timber suitable for construction.
The cedar is found in the near surrounding of the Ormana and these Lebanon cedars (Cedrus libani A. Rich.) are presently found primarily in the Mediterranean Region of Turkey. These trees are found generally found on theTaurus Mauntains between 800 and 1200-meter elevations.[21]

Lebanon cedars are very light and brittle, and wanting in strength; Tredgold says it is about 3/4 the strength of the best red pine; is easily worked; does not shrink much; is very durable when well ventilated. Has a pungent odour, which often unfits it for internal joinery, but

[20] http://www.pasvalco.com/Building%20Stone%20-%20A%20Technical%20Primer.htm

21 The Effect of Prescribed Fire on The Natural Regeneration Success of Lebanon Cedar (Cedrus libani A. Rich.) at Antalya-Kas Locality
Melih BOYDAK, Fikret ISIK, Bayram DOGAN, Tr. J. of Agriculture and Forestry, 22 (1998) 399-404 © TÜBITAK

protects it from being attacked by insects. A resinous substance exudes from the timber when freshly cut, and makes it difficult to work.[22]

- **Tile**

The roofing has *alla turca* roof tiles finishing which are lying parallel to the inclination direction of the roof facades but the roofs are the most repaired section of the traditional houses, therefore the original tiles of the roofs were extensively altered with "Marsilia" type of tiles in the houses. The length of the tile is about 32cm, the large end of the tile is about 18cm. and the narrow edge of the tile is about 12cm.

- **Plaster**

There are two different plasters used as the finishing materials in the buildings. These are mud plaster and cement plaster. Mud plaster, which includes sand and straw, is followed on the inner surfaces of the walls of the spaces, and some of the inner surfaces of the exterior walls of the buildings. The average thickness of the mud plaster is 2-3 cm.

Cement plaster is only followed on the walls of the exterior walls of the Gürsoy house and a part of the exterior walls of Eyüpoğlu House. New cement plaster is used only repaired parts of the houses. The thickness of the cement plaster, which is not painted or washed, is 3cm. All the plastered interior surfaces are washed with lime wash.

[22] http://chestofbooks.com/architecture/Building-Construction-2/The-Cedar-Cedrus-Libani.html

Others

The first group of this category is the metals. The only metal (iron) based element is the railing. They are all located in the windows located at the 2nd floor.
The second group is the earth that covers the *taşlık* space, storage and barn.

3.3. GENERAL CHARACTRISTICS OF STUDIED FOUR TRADITIONAL ORMANA HOUSES

3.3.1. GÜMÜSLER HOUSE

Gümüşler House is situated at the Palabıyık Çıkmazı , Number:4. It has a rectangular building lot and gives its two facades to the streets.

The building is constructed attached to the west corner of the lot. The base area of the dwelling is 182 square meters.ıt has a almost square plan with 13,12 m.x14 m. dimensions. In addition, a courtyard is reached through the door on the south-west wall of the building.

The dwelling consists of two main storeys; a ground floor and first floor. Because of the existing slope in the area, while south-west façade has two-storey high, north-west façade has a one-storey high. Both the ground and first floor are built up with rubble stone and timber beams masonry and the projection and *ayazlık* at the first floor are built up with timber skeleton system. Also the building is covered with a gable roof.

The main entrance of the House is located on the ground floor of the south-west façade that is parallel to the street and 14.00 m. and has an asymmetrical arrangement of its openings.

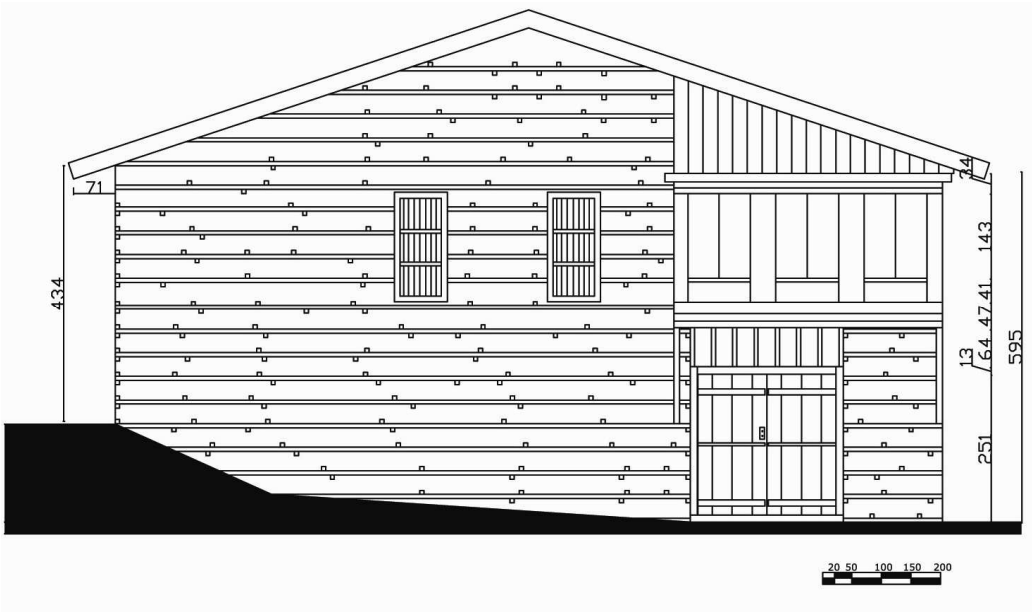


Figure 3. 10 The drawing of the south-west façade of Gümüşler House. Çelik, 2008.

Figure 3. 11 The photograph showing the south-west façade of Gümüşler House. Çelik, 2008.

The ground floor whose height is 3.30 meters consists of seven spaces. These spaces are coded from G01 to G08. G01 indicates *taşlık* space, which has a longitudinal plan scheme at the northeast – southwest direction and is entered from the main entrance at the southwest façade of the house. In this *taşlık* space, a staircase is adjacent to the south-west wall and leads directly to a circulation space at the upper floor coded F01 space as mentioned below. In addition, it has a direct physical connection with G07 space. Apart from this spatial feature of the space G07, it can be entered from a door at the southeast façade. The spaces coded as G02, G03, G05, G06, and G07 are the spaces that are used as a barn or depot. The space G04 can not be entered. Also, there is another staircase leading to F09 space at the first floor at the outer side of the west corner of the building which is an addition of late period.

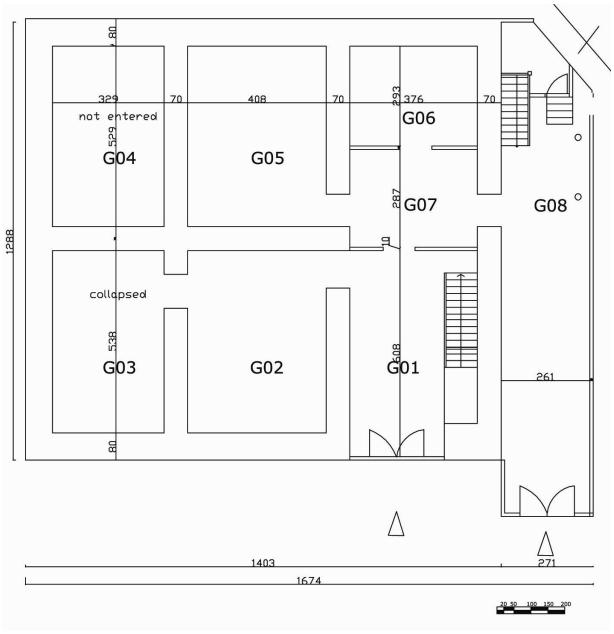


Figure 3. 12 The plan of the ground floor of Gümüşler House. Çelik, 2008.

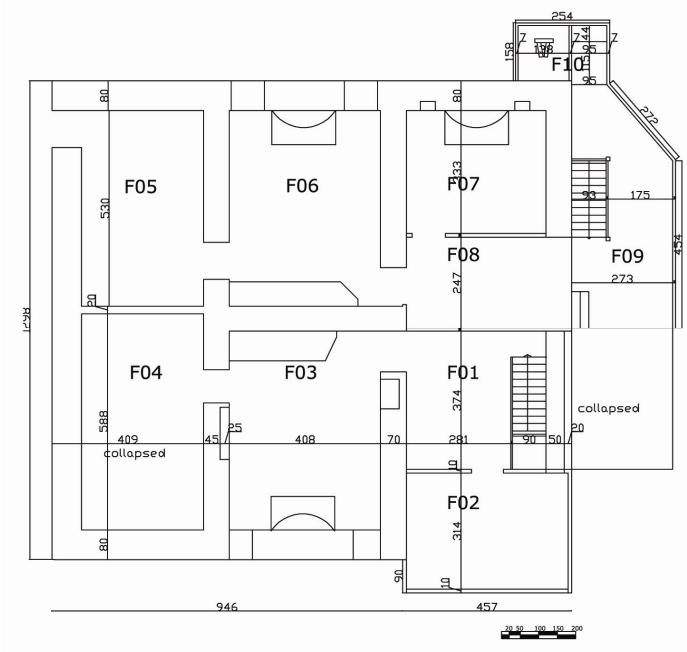


Figure 3. 13 The plan of the first floor of Gümüşler House. Çelik, 2008.

The first floor consists of ten spaces. These spaces at the first floor are coded from F01 to F10. The spaces F03, F06, F07 are used as rooms; F05 space is a depot; F04 space is collapsed and F01, F08 and F09 spaces are circulation spaces, F10 space is a WC. The first floor can be reached through the spaces F01 and F09 which the staircases are located in. Walls of the first floor are constructed with rubble stone and timber except partition walls and exterior wall of the F09 and F10. There are two projections in the house called *şahnişin* and *ayazlık* which are located at the south corner and south-east side of the first floor respectively. Both of them are constructed with timber skeleton system.

3.3.2 GÜRSOY HOUSE

Gürsoy House has a rectangular building lot and gives its one facade to the street.
The building is constructed attached to the north-east edge of the lot. The base area of the dwelling is 112, 5 square meters. It has an almost rectangular plan with 11, 7 m.x9, 6 m. dimensions.

The dwelling consists of two main storeys; a ground floor and first floor. The building set on a flat area. Both the ground and first floor are built up with rubble stone and timber beams masonry but the projection and two partition walls at the first floor are built up with timber skeleton system. Also the building is covered with a pitched roof which is an alteration of late period

The main entrance of the house is located on the ground floor of the south-west façade that is parallel to the street and 11.7 m. and has a symmetrical arrangement of its openings.

Figure 3. 14 The photograph showing the south-west façade of Gürsoy House. Çelik, 2008.

Figure 3. 15 The drawing of the south-west façade of Gürsoy House. Çelik, 2008.

The ground floor whose height is 3.15 meters consists of seven spaces. These spaces are coded from G01 to G07. G01 indicates *sofa* space, which has a longitudinal plan scheme at the northeast – southwest direction and is entered from the main entrance at the southwest façade of the house. In this *sofa* space, a staircase is adjacent to the northeast wall and leads directly to a circulation space at the upper floor coded F01 space as mentioned below.

In the ground floor, space G02 is a room, space G03 is used as a kitchen where has fireplace and cage, space G04 is a bathroom, space G05 is WC, space G06 is a corridor, space G07 is used as a food store and has a cage..

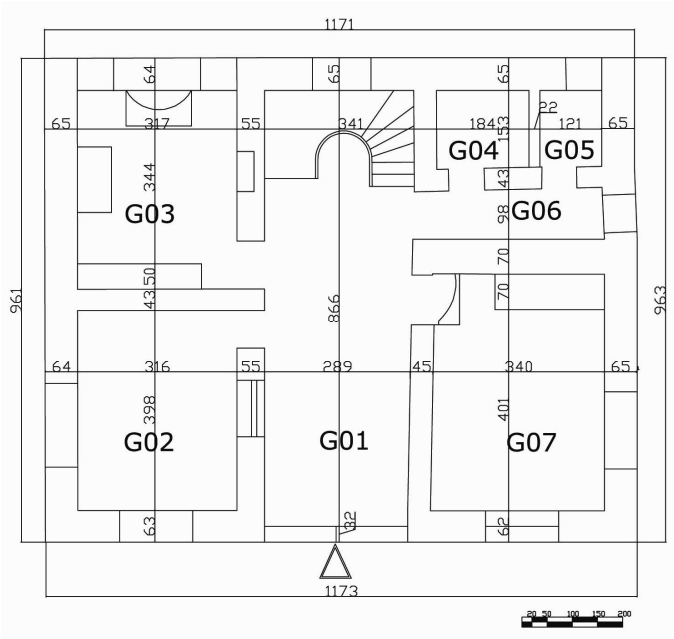


Figure 3. 16 The drawing of the ground floor plan of Gürsoy House. Çelik, 2008.

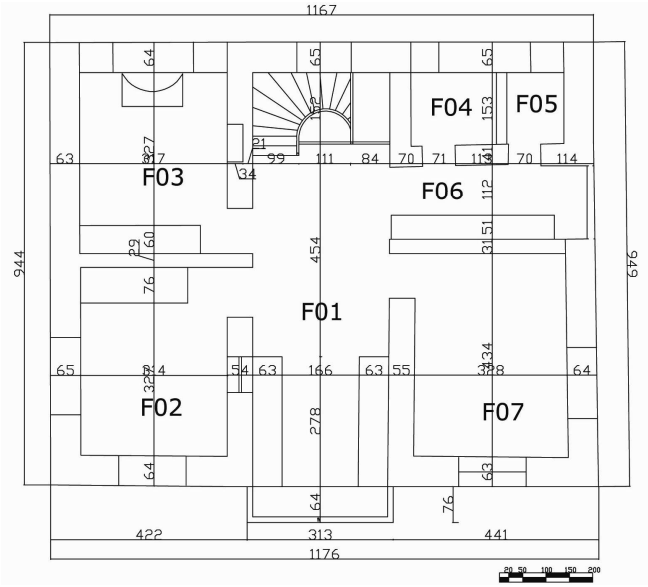


Figure 3. 17 The drawing of the first floor plan of Gürsoy House. Çelik, 2008.

The first floor consists of seven spaces. These spaces at the first floor are coded from F01 to F07. The spaces F02, F03, F07 are used as room and all of them have cupboard but only space F03 has a fire place. In addition F01 is a sofa space, F04 space is a bathroom and F05 space is a WC. The first floor can be reached through the spaces F01 which the staircases are located in. Walls of the first floor are constructed with rubble stone and timber except partition walls. There is a projection in the house called *cumba* which is located at the middle of the south west facade of the first floor respectively and constructed with timber skeleton system.

3.3.3 MUNICIPALITY'S GUEST HOUSE

Municipality's Guest House has a corner building lot which is a trapezoid nearly and gives its three facades to the streets.

The building is constructed attached to the north-east corner of the lot. The base area of the dwelling is 151 square meters. It has an almost square plan with 12, 10 m.x12, 50 m. dimensions.

The dwelling consists of two main storeys; a ground floor and first floor. The building set on a flat area. Both the ground and first floor are built up with rubble stone and timber beams masonry but the ayazlık and şahnişin spaces at the first floor are built up with timber skeleton system. Also the building is covered with a gable roof.

Figure 3. 18 The photograph showing the south-east façade of Municipality Guest House. Çelik, 2008.

Figure 3. 19 The drawing of the south-east façade of Municipality Guest House. Çelik, 2008.

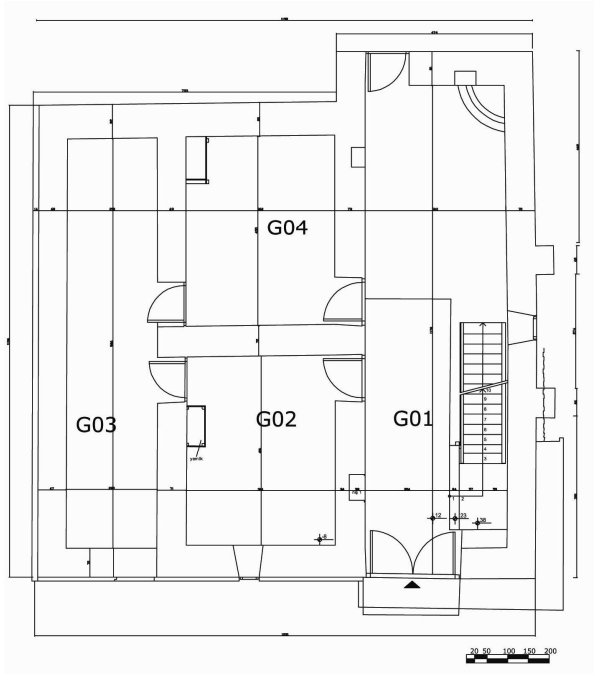


Figure 3. 20 The drawing of the ground floor plan of Municipality Guest House. Çelik, 2008.

The ground floor whose height is 3.41 meters consists of four spaces. These spaces are coded from G01 to G04. G01 indicates *taşlık* space, which has a longitudinal plan scheme at the northwest – southeast direction and is entered from the main entrance at the southeast façade of the house. In this *taşlık* space, a staircase is adjacent to the north-east wall and leads directly to a circulation space at the upper floor coded F01 space as mentioned below. In addition, it can be entered from a door at the northwest façade. The spaces coded as G02, G03, and G04 are the spaces that are used as a barn or depot.

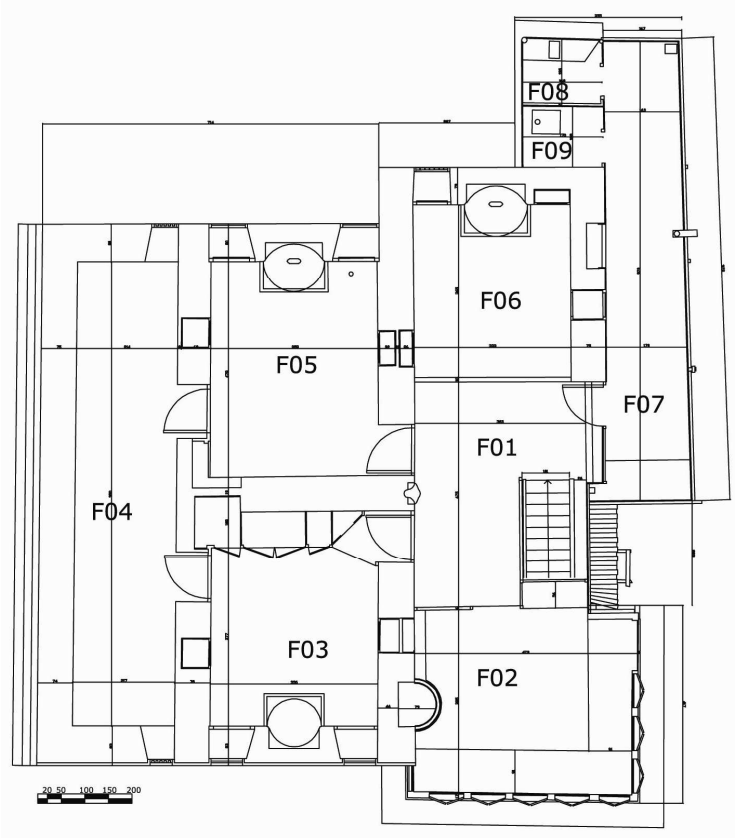


Figure 3. 21 The drawing of the first floor plan of Municipality Guest House.

The first floor consists of nine spaces. These spaces at the first floor are coded from F01 to F09. The spaces F03, F05, F06 are used as rooms and have fire places but only the F03 space has service wall; F04 space is a depot; F04 space is collapsed and F01 and F07 spaces are circulation spaces, F08 and F09 spaces are wet spaces. In addition F02 space is called as şahnişin and has fire place and sedir. The first floor can be reached through the spaces F01 which the staircases are located in. Walls of the first floor are constructed with rubble stone and timber except exterior walls of the wet spaces, F02 and F07. There are two projections in the house called *şahnişin* and *ayazlık* which are located at the east and north corners of the first floor respectively. Both of them are constructed with timber skeleton system.

3.3.4 EYÜPOĞLU HOUSE

Eyüpoğlu House has a rectangular building lot and gives its one facade to the street.

The building is constructed attached to the west side of the lot. The base area of the dwelling is 190 square meters. It has a rectangular plan with 12, 67 m.x15, 05 m. dimensions.

The dwelling consists of three storeys; a ground floor, mezzanine and first floor.. All the floors are built up with rubble stone and timber beams masonry and the projection and *ayazlık* at the first floor are built up with timber skeleton system. Also the building is covered with a pitched roof.

The main entrance of the house is located on the ground floor of the south- façade that is parallel corner of the street and 12, 67 m. and has an asymmetrical arrangement of its openings.

The ground floor whose height is 3.30 meters consists of six spaces. These spaces are coded from G01 to G06. G01 indicates *taşlık* space, which has a longitudinal plan scheme at the south – north direction and is entered from the main entrance at the south façade of the house. In this *taşlık* space, a staircase is adjacent to the east wall and leads directly to a circulation space at mezzanine and at the upper floor coded F01 space as mentioned below.. The spaces coded as G02, G03, G05, G06, and G06 are the spaces that are used as a barn or depot. In addition, spaces of the mezzanine floor which are coded M01 to M05 are used as depot. Also, there is another staircase leading to F07 space at the first floor at the outer side of the west corner of the building which is an addition of late period.

The first floor consists of eight spaces. These spaces at the first floor are coded from F01 to F08. The spaces F02, F04, F05, and F08 are used as rooms; F03 space is a kitchen; F01 and F06 spaces are circulation spaces. F08 space is *ayazlık* space.

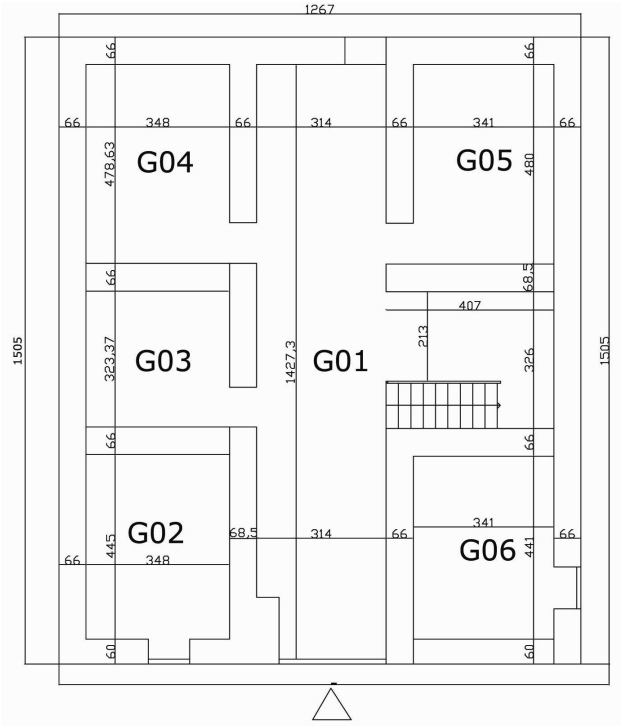


Figure 3. 22 The plan of the ground floor of Eyüpoğlu House. Çelik, 2008.

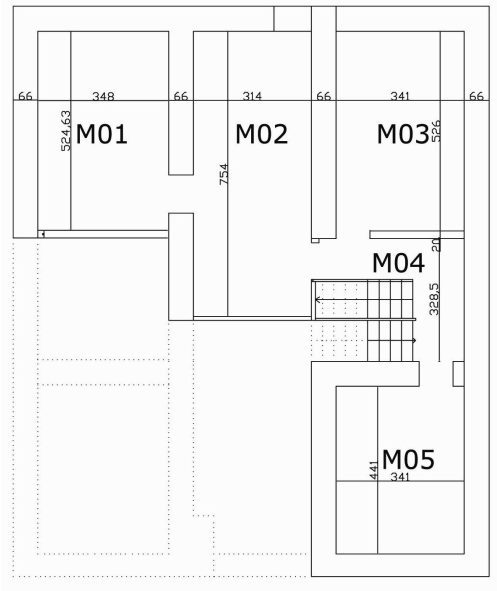


Figure 3. 23 The plan of the mezzanine floor of Eyüpoğlu House. Çelik, 2008.

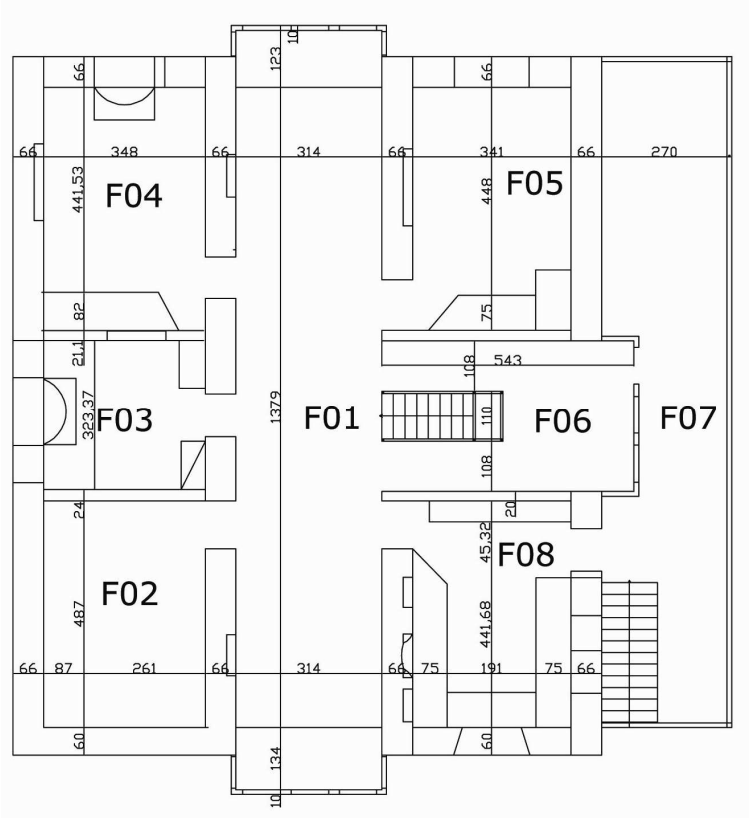


Figure 3. 24 The plan of the first floor of Eyüpoğlu House. Çelik, 2008.

CHAPTER 4

CONSTRUCTION TECHNIQUES AND DETAILING

4.1. STRUCTURE AND MATERIAL CHARACTERISTICS

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. As a methodology, structural analyses of the Ormana Houses are based on this classification.

The masonry base is a combination of the stone masonry foundation walls and the rubble stone masonry ground and upper floor walls framing with timber on top of that. These two parts built with the same type of serpentine stone.

4.1.1 FOUNDATIONS

According to the interview of the inhabitants and craftsman, in Ormana, the area has a comparatively rough and rocky character

therefore inhabitants prefer rocky zones to built house for to gain more field of agriculture.

The foundations can be classified in two categories according to their structural and material characteristics.

i) Type A

In this type of foundation, rocky zone is used as a foundation of the buildings. The ground floor walls are built up on top of the rock, the connection between the superstructure and rock is made without any joint. The depth and width of the rock is changeable.

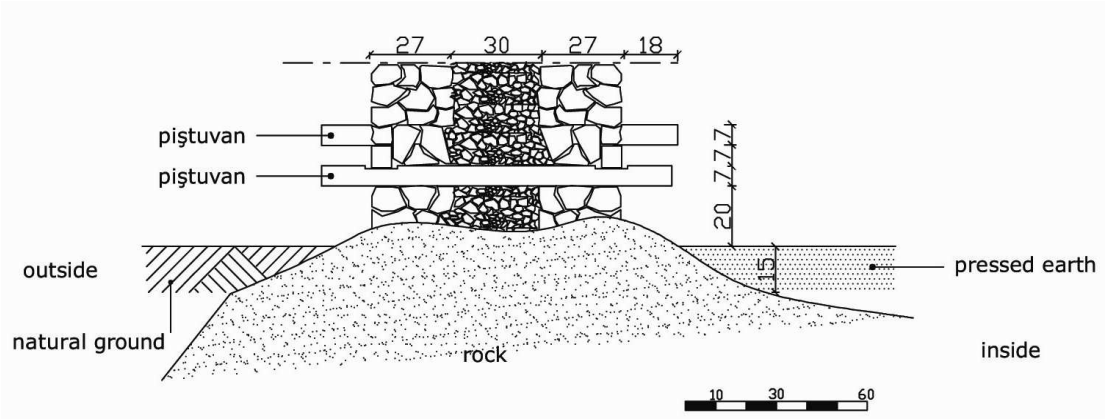


Figure 4. 1 Drawing of the foundation type A. Çelik 2008.

a) b)

Figure 4. 2 a-) Photograph of the foundation type A

ii) Type B

This type of the foundation 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. Also there is no foundation under the timber partition walls.

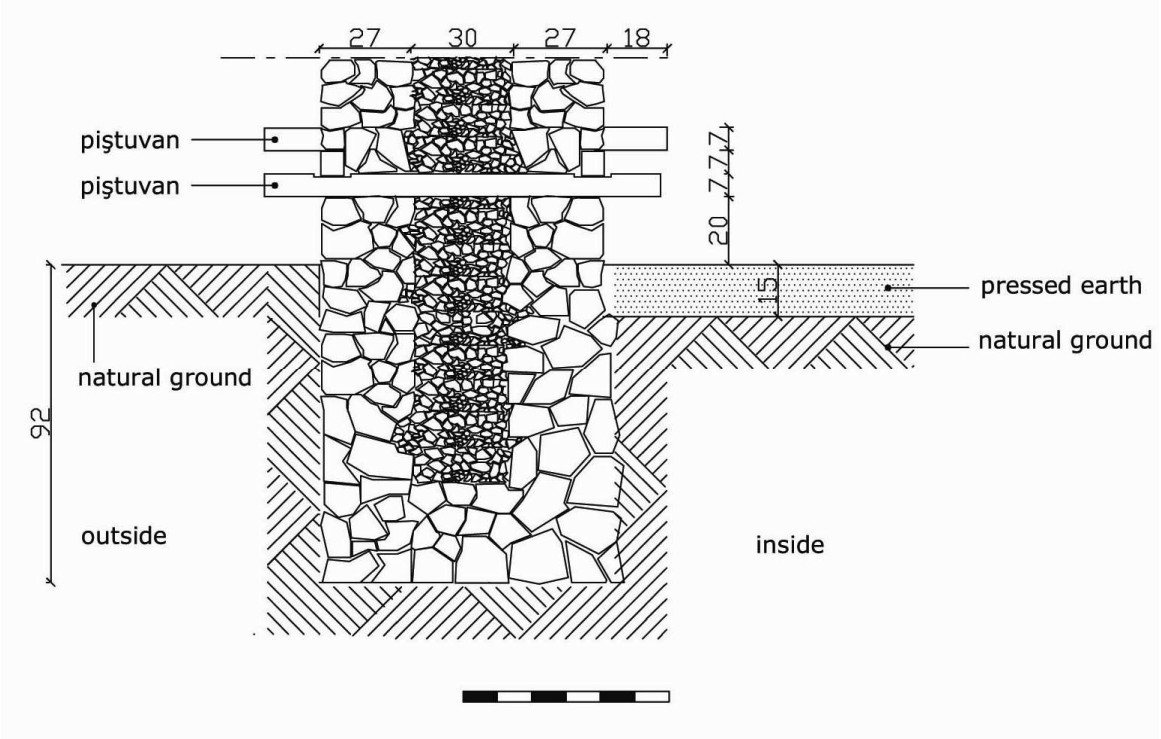


Figure 4. 3 Drawing of the foundation type B. Çelik 2008.

4.1.2 FRAMING SYSTEMS

4.1.2.1 MASONRY WALL FRAMİNG

The ground floor walls are made of rubble stone and timber while the foundations are built with only rubble stone. The rubble stones were used in an irregular order in stone masonry walling where the bigger stones are placed in the outer parts and the small ones placed in the inner parts. Five types of walls are observed in the Ormana Houses

WALL TYPE 1

Walls are constructed with alternating rows of rubble stone and timber and are constructed with rubble stone without using any mortar which are called as ”düğmeli duvar”. These walls consist of 60-80 cm. thick double skin wall constructions. Both sides of the double skin wall are made of rubble stones. 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 and these parts of the wall are 20 cm to 25 cm in size.
Timber bond beams are horizontally placed at every 30-35 cm in two directions for the reinforcement of the wall. This part of the wall called as destur. The timber beams at the exterior surface are fine cut timber and their cross section changes from 7x7 to 8x8cm. The timber beams which are used at short dimension of the wall called as pişţuvan. Pişţuvans have square section, the cross section of the pişţuvan’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.

The connection of the pişţuvan and beam is made by cutting away 1.5-2 x 10 cm from the face of the pişţuvan and corresponding from up side of the timber beam. In addition, the cut surfaces of the pişţuvan and the timber bond beam are connected to each other with one nail. There is no mortar and plaster used in walls. These types of walls are used at the exterior walls of the houses.

Figure 4. 4Wall detail from the Gümüşler House

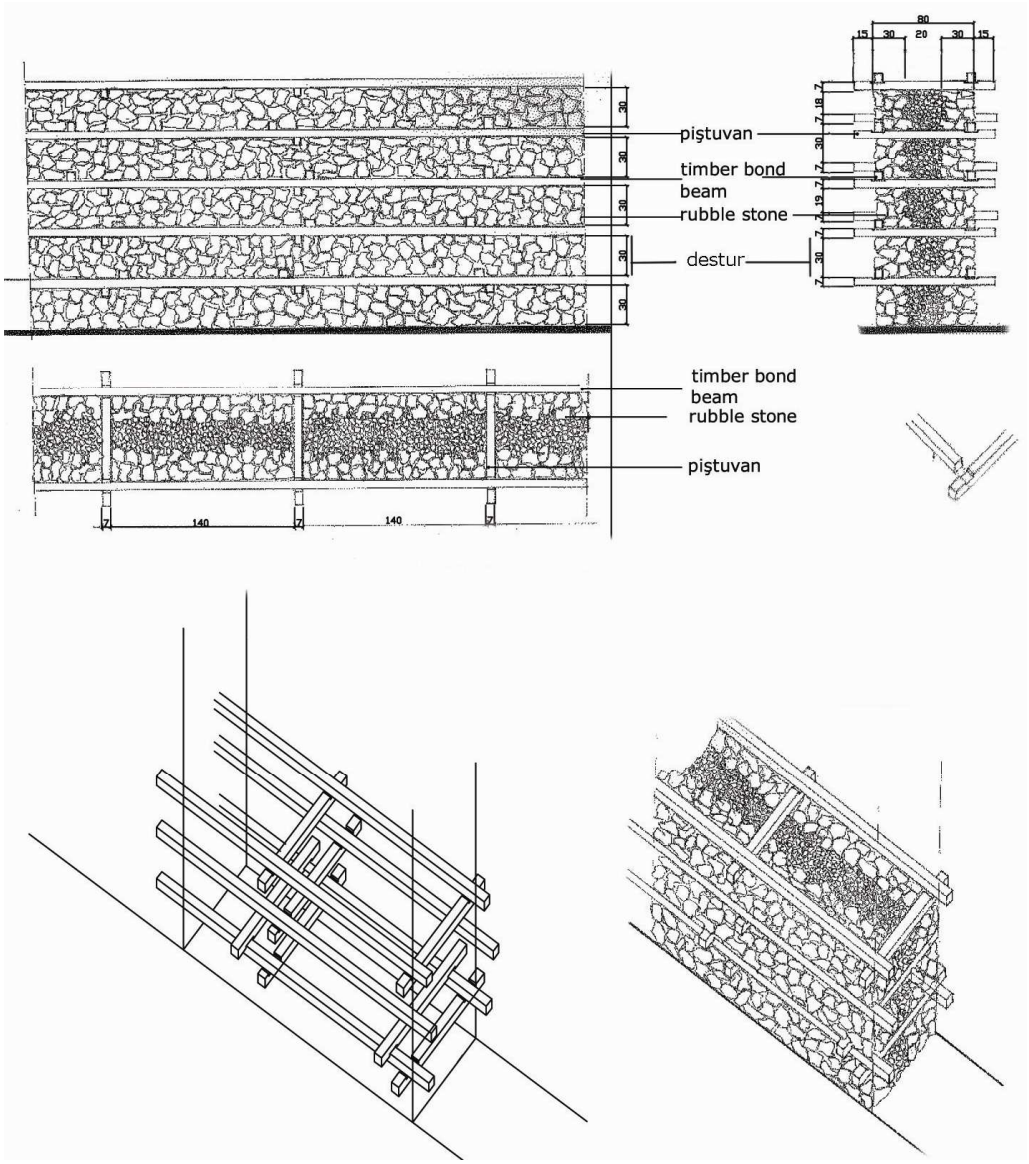


Figure 4. 5 Drawing of wall type 1. Çelik 2008.

WALL TYPE 2

It is the wall which basically carrying similar features of the wall type1. however the inner skin of this type of the wall is plastered with mud

plaster. Thickness of the mud plaster is 2-3 cm. These types of walls are used at exterior walls of the houses.

Figure 4. 6 detail from wall type 2 Çelik 2008.

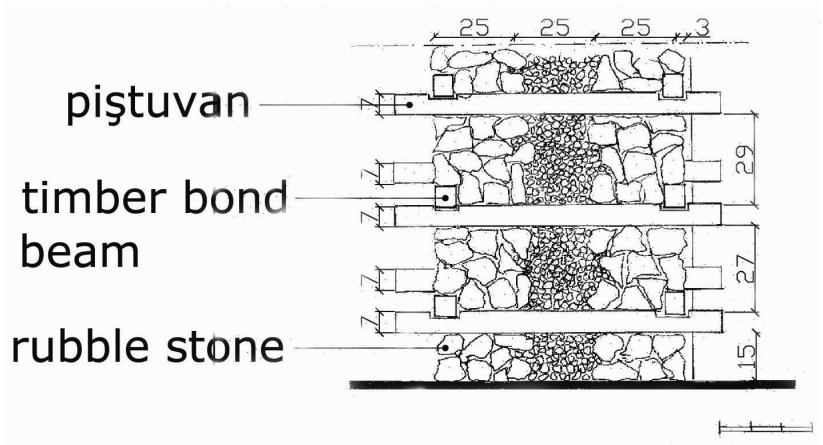


Figure 4. 7 Drawing of the wall type 2. Çelik 2008.

WALL TYPE 3

This type of the wall has basically similar features of the wall type 2. However, the both sides of the surfaces of the wall are plastered with mud plaster. Thickness of the mud plaster is 2-3 cm. These types of walls are used at interior walls of the houses.

Figure 4. 8 Detail from the wall type 3. Çelik 2008.

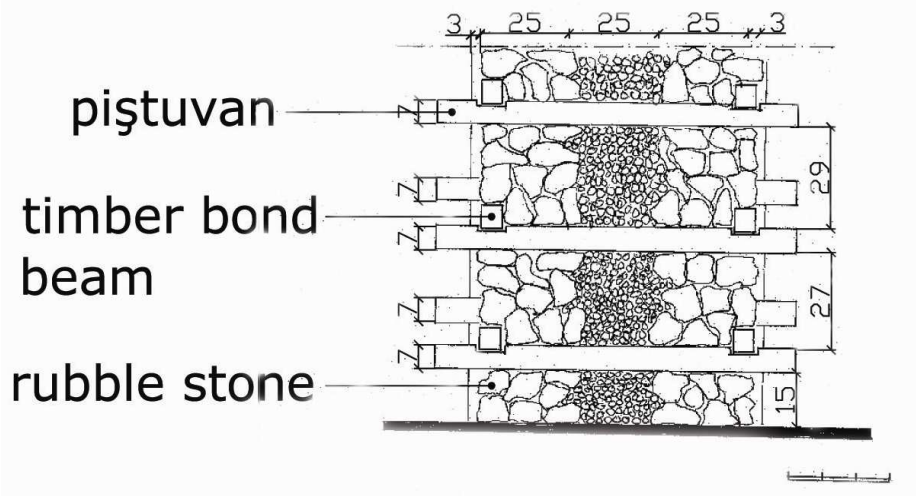


Figure 4. 9 Drawing of the wall type 3. Çelik 2008.

WALL TYPE 4

It is the wall which basically carrying similar construction features of the wall type1; however the pişţuvans are not projected from wall surfaces and both sides of the surfaces are plastered with mud plaster. Thickness of the mud plaster is 2-3 cm. These types of walls are used at interior walls of the house.

Figure 4. 10 Detail from wall type 4. Çelik 2008.

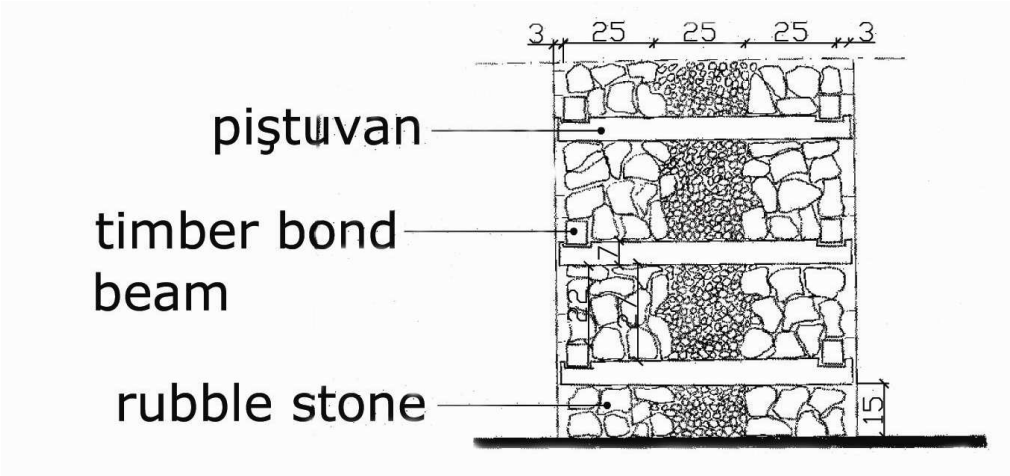


Figure 4. 11 Drawing of the wall type 4. Çelik 2008.

WALL TYPE 5

These walls consist of 60-80 cm. thick double skin wall constructions. Both sides of the double skin wall are made of rubble stones. 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 and these parts of the wall are 20 cm to 25 cm in size.

Figure 4. 12 Detail from wall type 5. Çelik 2008.

As it can be seen this type of wall is carrying similar construction features of the wall type 4, however the pişţuvans are not projected from wall surfaces and one side of the surface plastered with mud plaster. Thickness of the mud plaster is 2-3 cm. In addition, exterior surface of the walls are covered with weathering boards. These types of walls are used at exterior walls of the house.

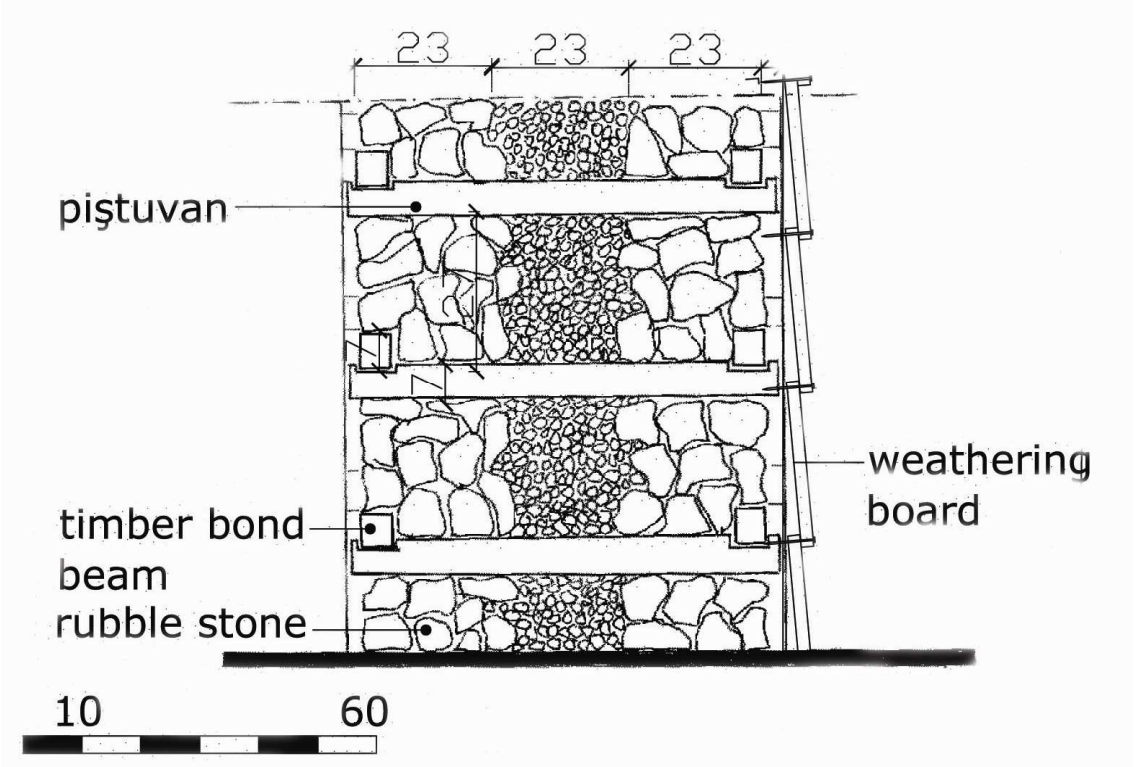


Figure 4. 13 Drawing of the wall type 5. Çelik 2008.

CONNECTION OF THE EXTERIOR WALLS

At the end of the exterior walls, pişţuvans are replaced both at the bottom and over the timber bond beams. The *pişţuvan* that is located over the beam is cut away as the bottom pişţuvan. Between these two pişţuvans, small rubble stones are filled.

Figure 4. 14 Detail from the wall connection. Çelik 2008.

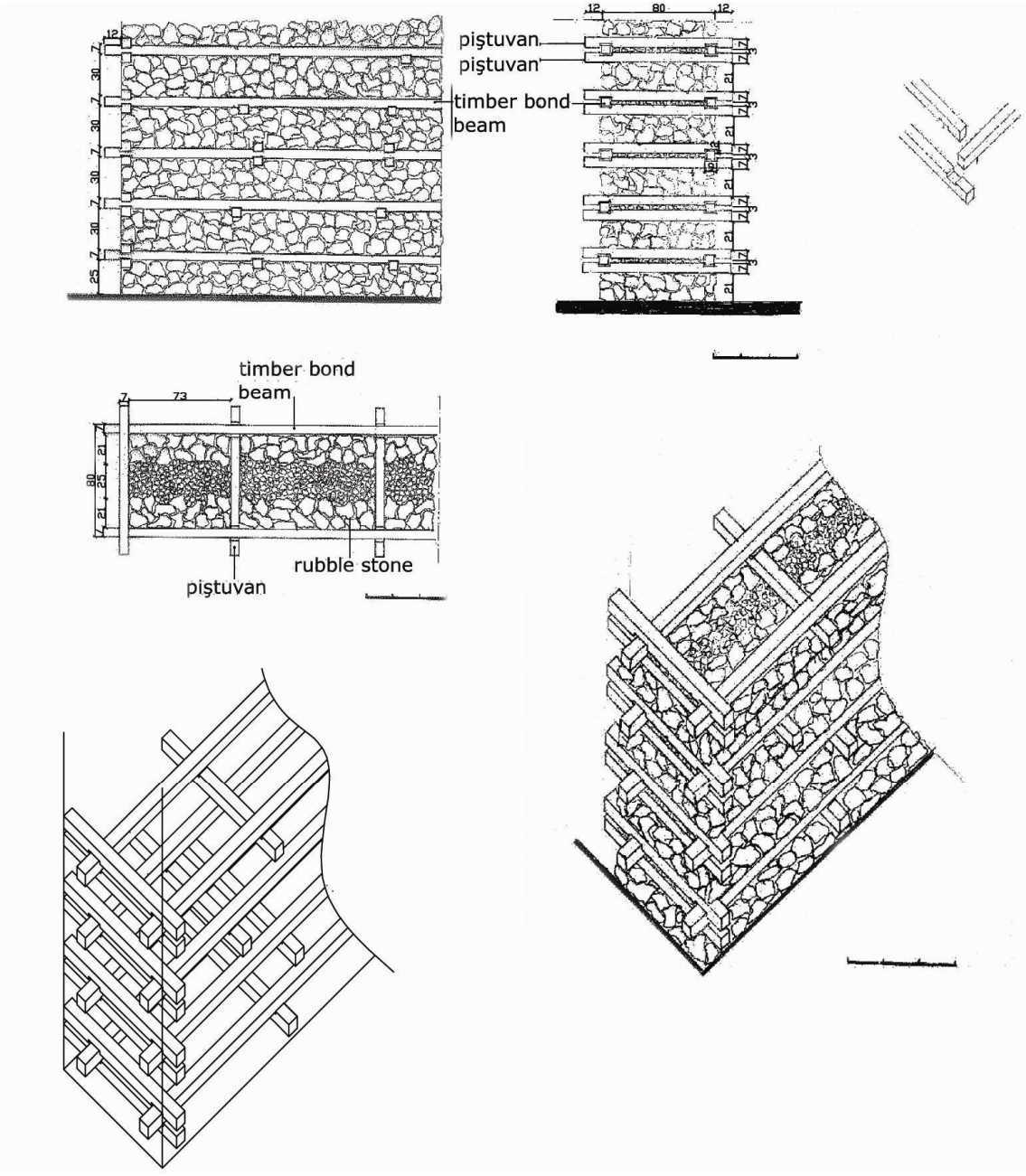


Figure 4. 15 Drawing of the wall connection…. Çelik 2008.

4.1.2.2. *TIMBER WALL FRAMING*

WALL TYPE 1

This type of timber frame walls divides the taşlık – barn and barn spaces. The walls are constructed with timber posts, ledgers that are rough cut, and they have rectangular cross sections. Dimension of posts is 5x10 cm. and ledgers is 3x10cm Posts are located at the both sides and the middle of the opening. Posts that are located at the both sides are nailed to the pişţuvans of the masonry walls. Ledgers are nailed between posts. One side of this timber frame is covered with 2 x 25 cm. boards by nailing the ledgers.

Figure 4. 16 Detail from timber wall type 1. Çelik 2008.

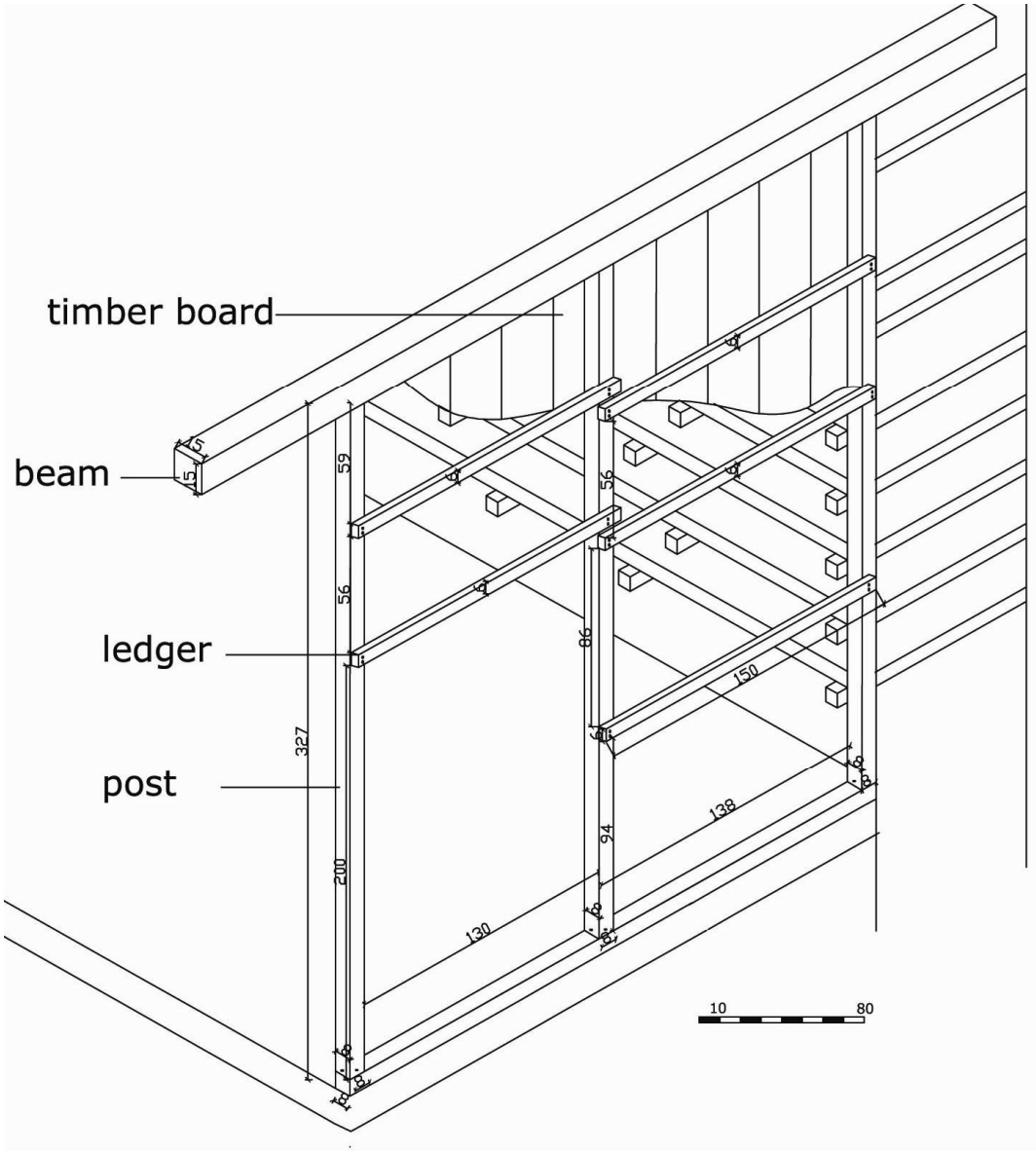


Figure 4. 17Drawing of the timber wall type 1. Çelik 2008.

WALL TYPE 2

These types of timber frame walls divide room and sofa spaces. The walls are constructed with timber posts, ledgers, which are rough, cut, and they have square cross sections. Dimension of these timber

elements is 6x6 cm. and their length varies according to the floor height.

Posts are located at the one side and the middle of the opening. Post, which is located at the one side, is nailed to the pişţuvans of the masonry walls. Ledgers are nailed between posts and the pişţuvans of the wall. One side of these timber frames is covered with 2 x 25 cm. boards by nailing the ledgers.

Figure 1 Detail from timber wall type 2. Çelik 2008.

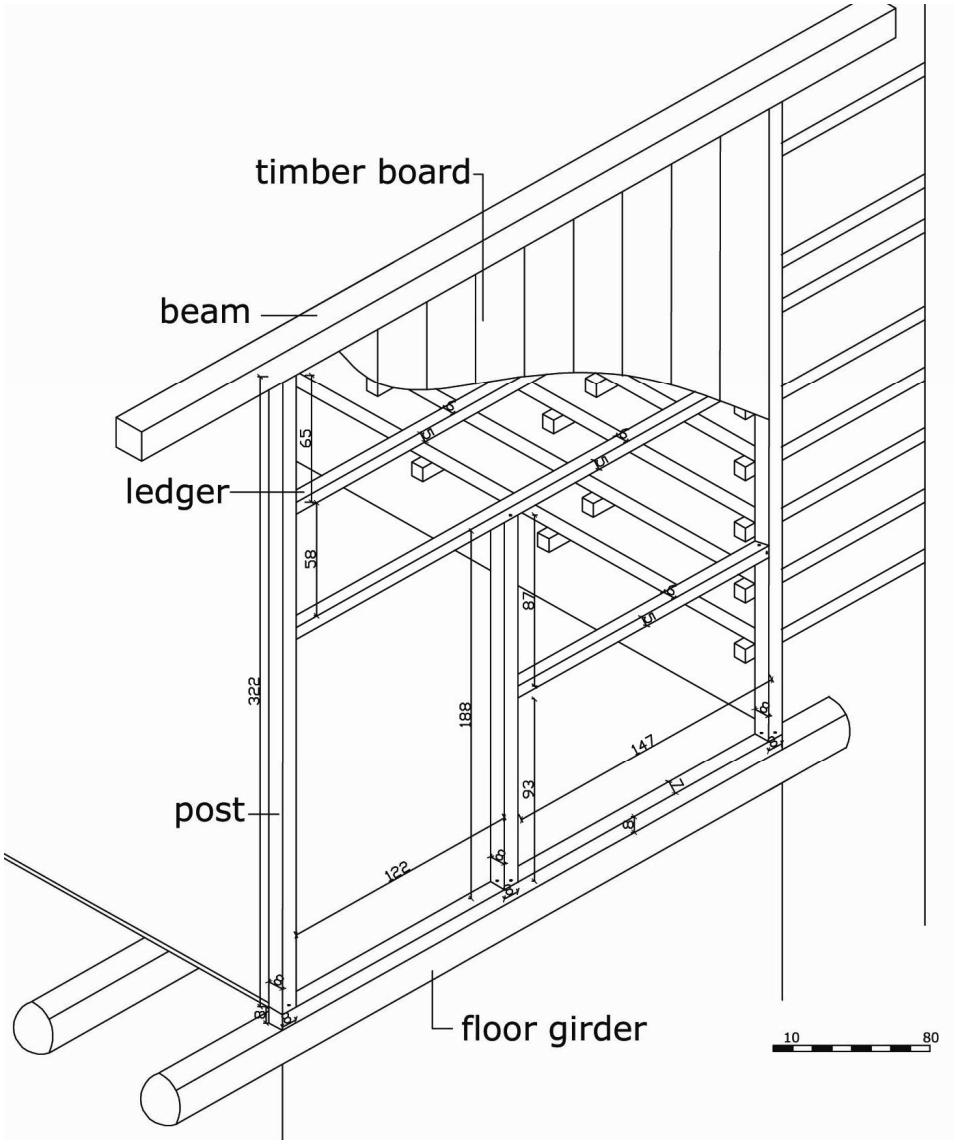


Figure 4. 18 Drawing of the timber wall type 2. Çelik 2008.

WALL TYPE 3

This type of timber frame walls divides şahnişin and sofa spaces. The walls are constructed with timber posts, lintels and studs that are cut and they have square cross sections. Dimensions of these timber elements is 5x5 cm. Posts are placed at the corner, window, next to

the door. Posts are placed intervals 90-100 cm supported by studs. Studs are installed between the posts in order to carry the load and covering material. At the top of the wall studs are nailed to the roof rafters. Lintels are installed at the top and bottom of the posts and studs. The size of these members is mostly the same as the posts.

Posts, which are located at the one side, are nailed to the pişţuvans of the masonry walls. Lintels are nailed between posts and the pişţuvans of the wall. One side of these timber frames is covered with 2 x 25 cm. boards by nailing the lintels and posts.

Figure 4. 19 Detail from timber wall type 3. Çelik 2008.

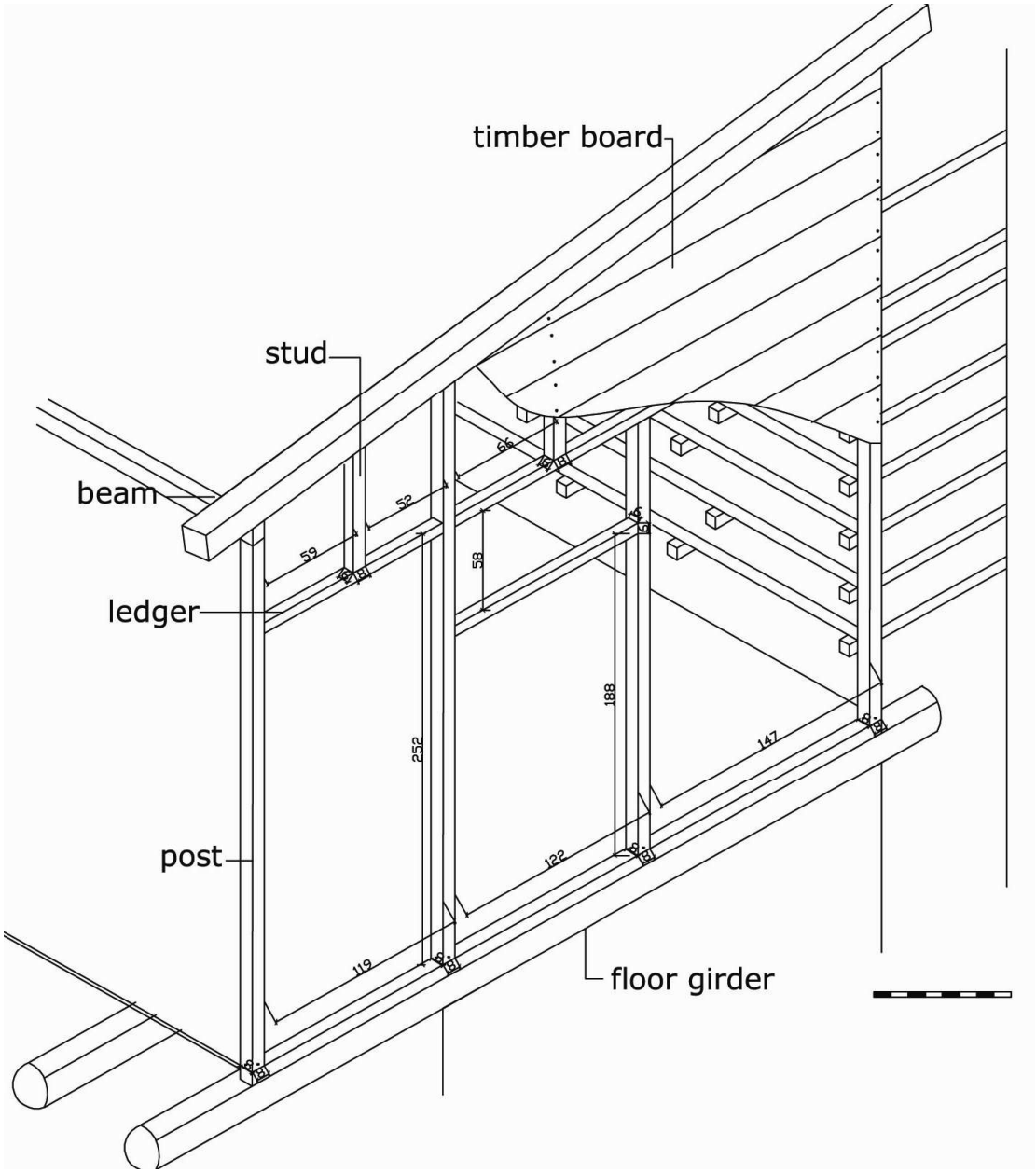


Figure 4. 20Drawing of the timber wall type 3. Çelik 2008.

WALL TYPE 4

It is the wall which basically carrying similar construction features of the wall type3; however these timber frames is covered with weather boards. These types of walls are used as an exterior wall at second floor.

Figure 4. 21 Detail from timber wall type 4. Çelik 2008.

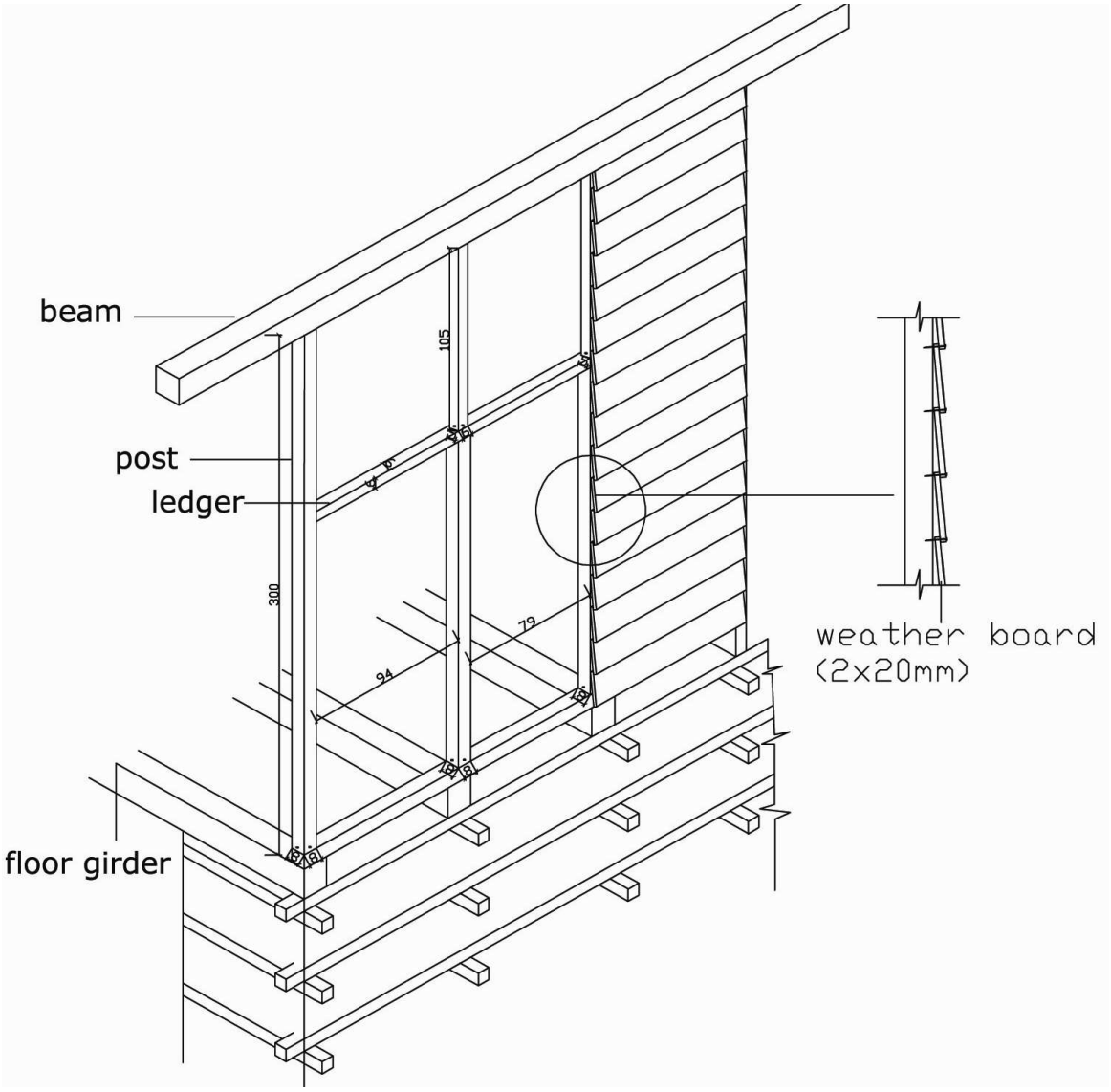


Figure 4. 22 Drawing of the timber wall type 4. Çelik 2008.

WALL TYPE 5

These types of timber frame walls divide sofa and rooms at the upper floors. The walls are constructed with timber posts, lintels and studs that are cut and they have square cross sections. Posts, which are located at the corners, are nailed to the pişţuvans of the masonry walls. Wood lath provided with nailing laths on to two faces of these posts or studs in horizontal direction to provide a base for the plaster. Timber laths with a size of 3x 1,5 cm and nailed on to timber posts. These laths are at closed intervals approximately 3 cm. In addition, mud plaster is applied onto the timber laths. Thickness of the plaster is approximately 2-3 cm.

Figure 4. 23 Detail from timber wall type 5. Çelik 2008.

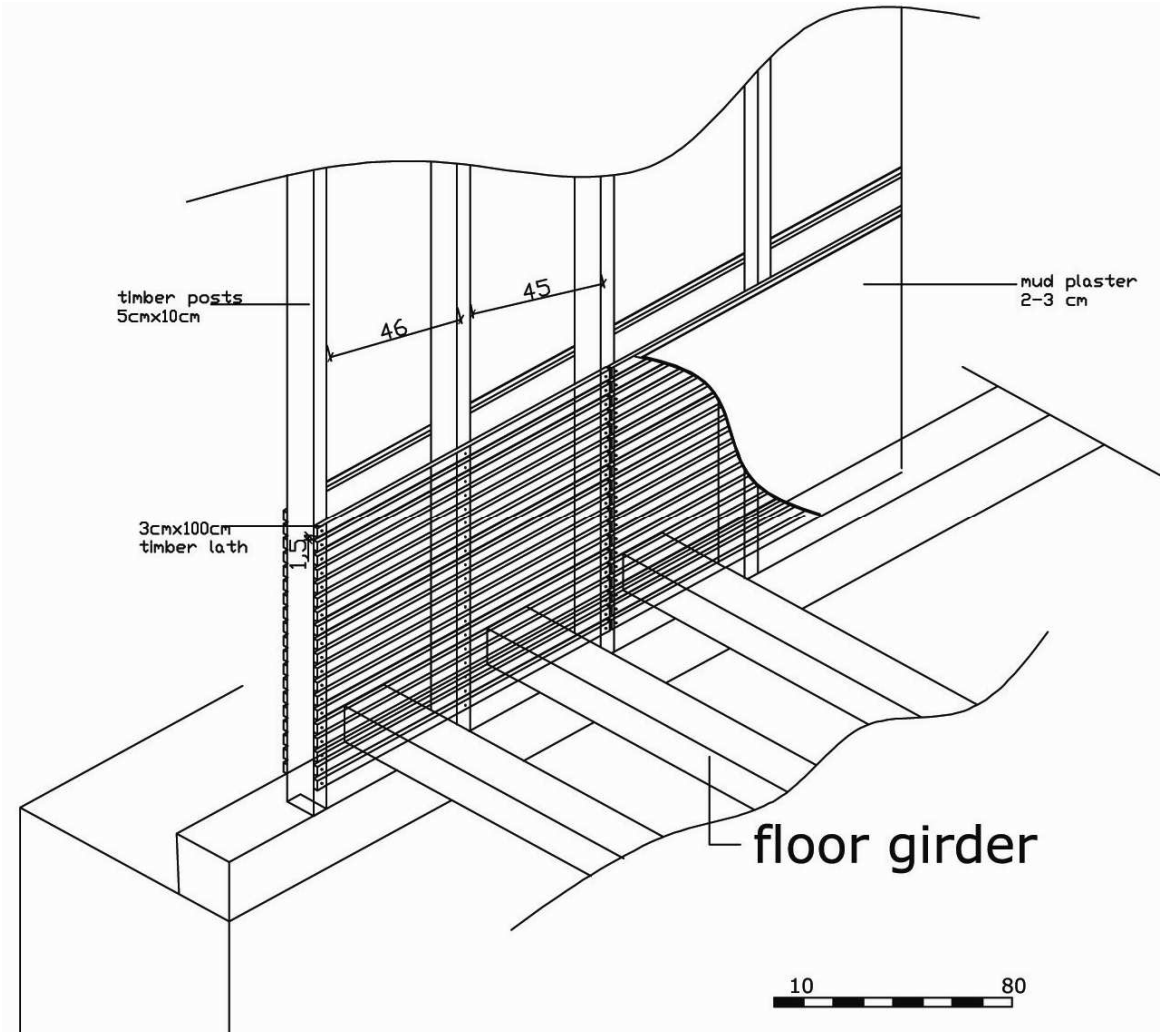


Figure 4. 24 Drawing of the timber wall type 5. Çelik 2008.

1.2.3 FLOOR CONSTRUCTIONS

The floor pavement of the service spaces like storage, barn, etc. that are placed in the ground floors, was covered with pressed earth in the houses.

Figure 4. 25 Detail from earth floor. Çelik 2008.

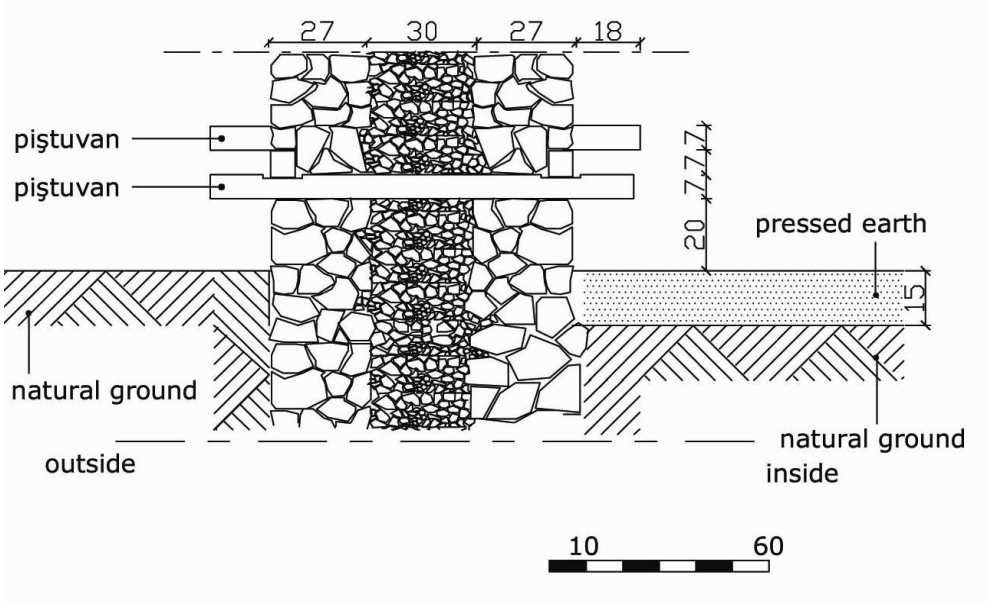


Figure 4. 26 Drawing of the section of the earth floor. Çelik 2008.

Timber floor techniques can be basically categorized in two groups.

TYPE 1.

Floors are constructed laying girders at short spans of the walls.
Timber floors are constructed by placing the floor girders that have a circular cross section about r:15 cm. on the timber sill plates. The floor girders are put in a row that consists of single layers.

The timber sill plates, which the floor girders set, are put on the timber bond beams of the walls. Afterwards the girders are inserted 30-40 cm. in to the walls.

The top of the floor girders was covered with the timber flooring boards (2x20cm) perpendicular to them. A timber plinth surrounded the edges of the space, where the flooring and the wall met.

Figure 4. 27Detail from floor construction type 1. Çelik 2008.

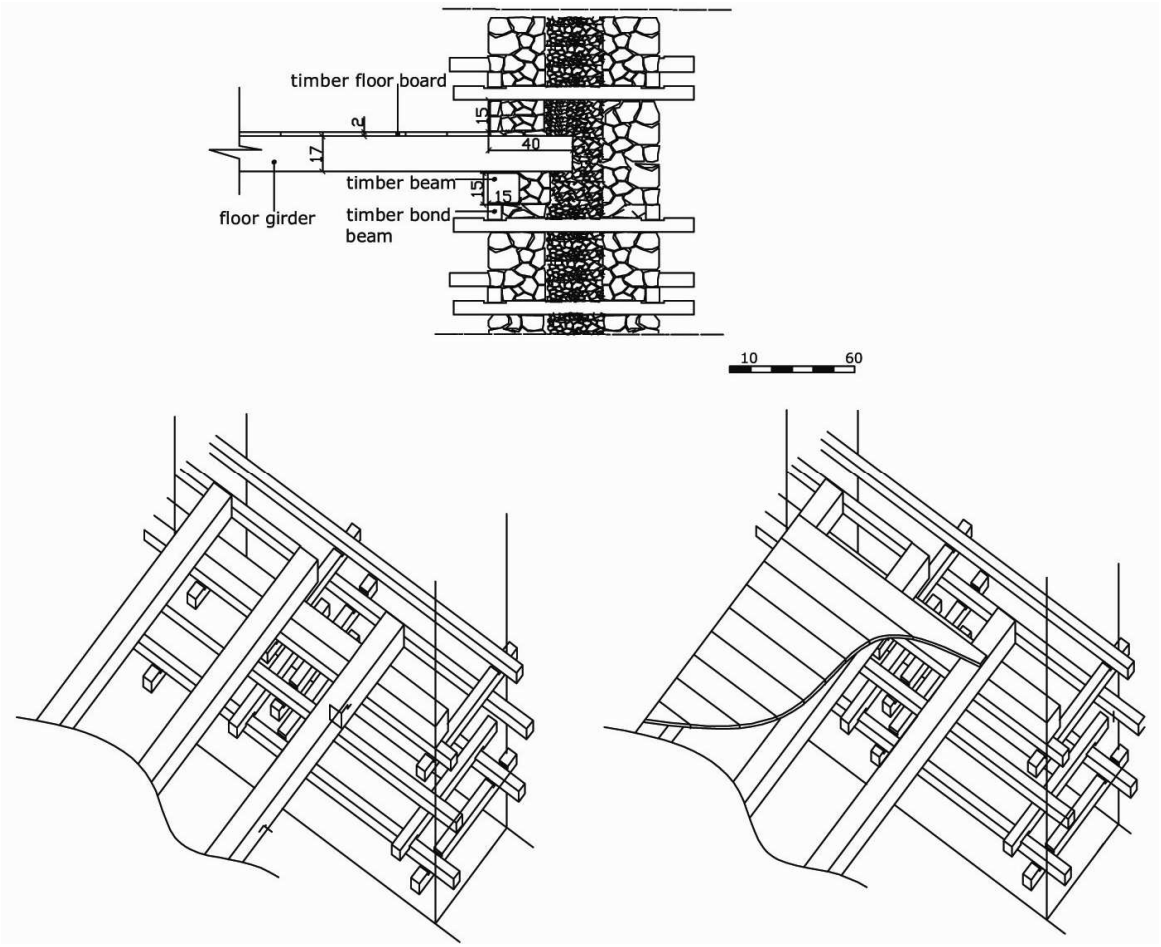


Figure 4. 28Drawing of the floor construction type 1. Çelik 2008.

TYPE 2.

It is the floor which basically carrying similar construction features of the floor type1, however the girders set on the timber bond beams of the walls directly.

Figure 4. 29Detail from floor construction type 2. Çelik 2008.

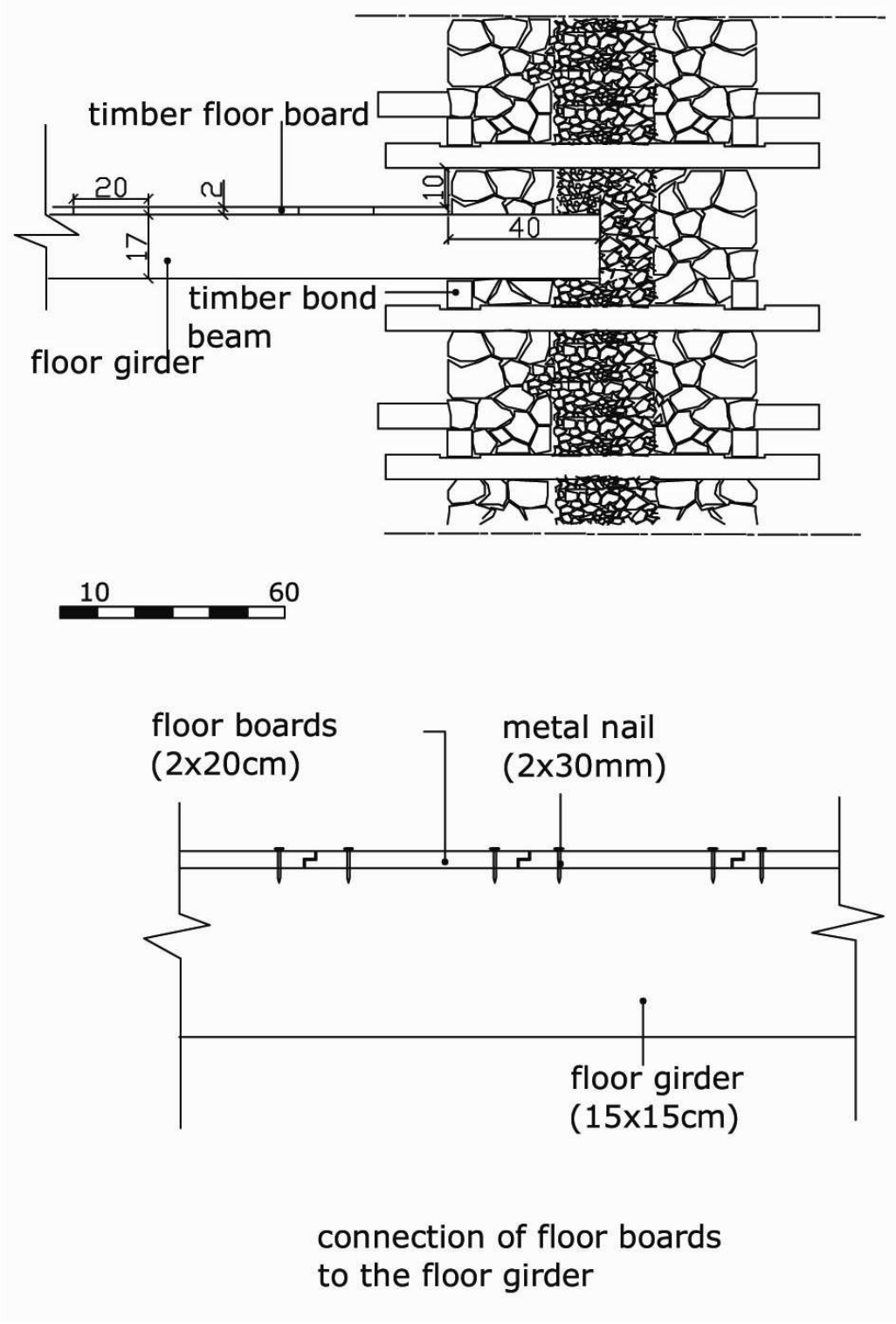


Figure 4. 30 Drawing of the floor construction type 2. Çelik 2008.

4.1.2.4 *PROJECTION AS A PART OF FLOOR STRUCTURE*

The timber-framed projections that have rectangular form is located in the *şahnişin* space and built as a part of the floor construction. The *sedir* that is sitting platform located as an inseparable part in the projection was built with the projection.

Projections can be categorized in two groups.

TYPE 1.

The projection is constructed by extending lookout joists further than ground floor wall and nails to the first floor girders anchor them. Also these projections are supported with three brackets which are nailed to the *pişt*uvans of the ground floor wall. The reason to use brackets to prevent the bending of extended joists. Above this lookout joists seki is constructed by two layers of joists in two directions one on top of the other.

The framing of openings of the projection consist of horizontal members called headers (5x10),ledgers (5x10), sills (5x10); vertical members called posts (10x10) and studs (5x10).

Main posts are placed at corners of the projection. The cross section of the main posts is 10x10 cm. and their length is 200 cm. main posts set on footplate that is set on top of the joists. The main posts are assembled the upper and lower elements with two or three nails, they don not contain almost any joints. The other vertical elements are window posts and studs. The cross section of the window posts are 10x10 cm. and studs are 5x10 cm.

The upper and lower sills for the windows are located between the window posts. The cross section of the sills is 5x10 cm.

The spans are between the window and main posts are divided regularly by studs and covered with timber boards.

Figure 4. 31 Detail from the projection type 1 Çelik 2008.

Figure 4. 32 Detail from the projection type 1 Çelik 2008.

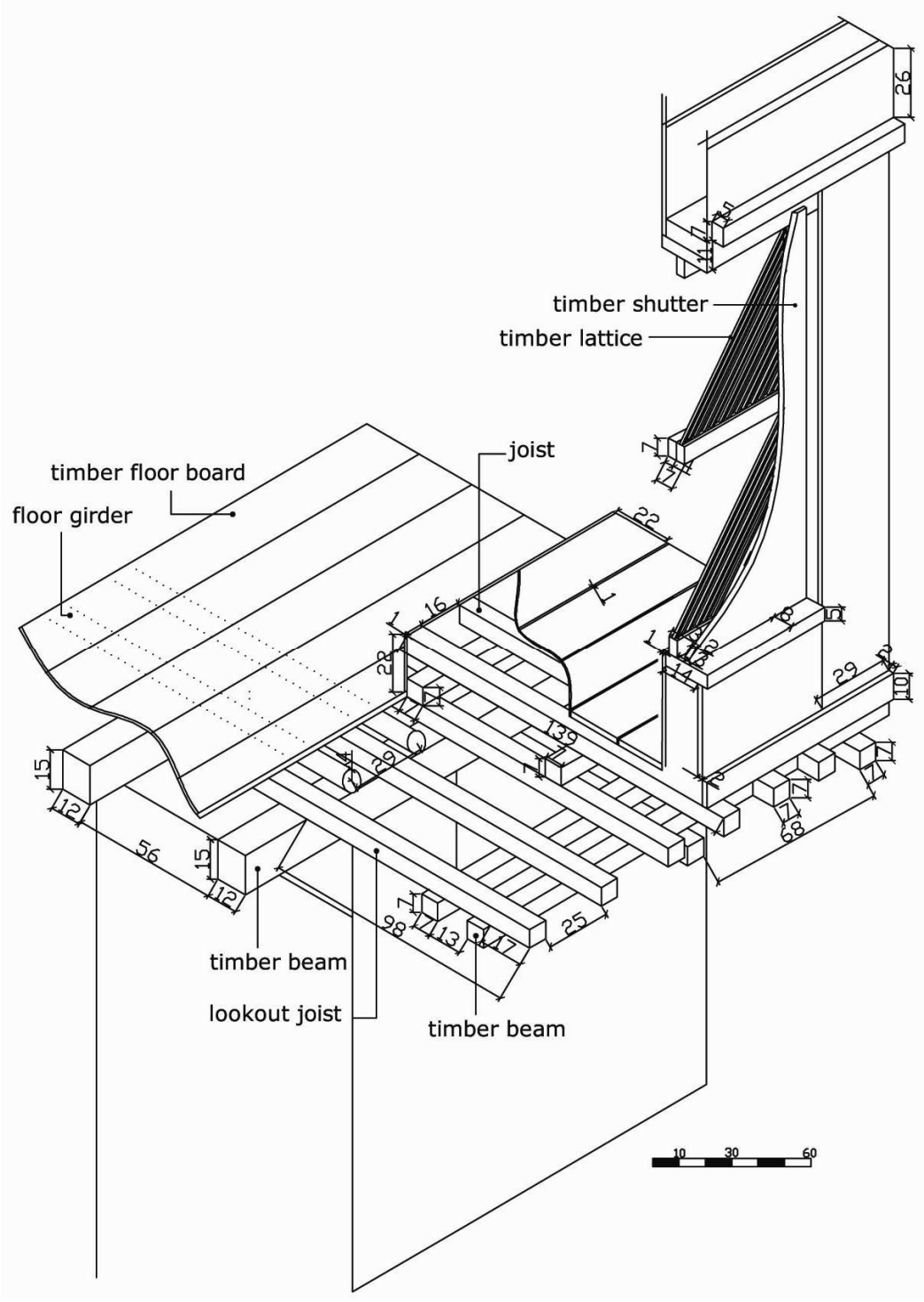


Figure 4. 33 Drawing of the projection type 1.Çelik 2008.

TYPE 2.

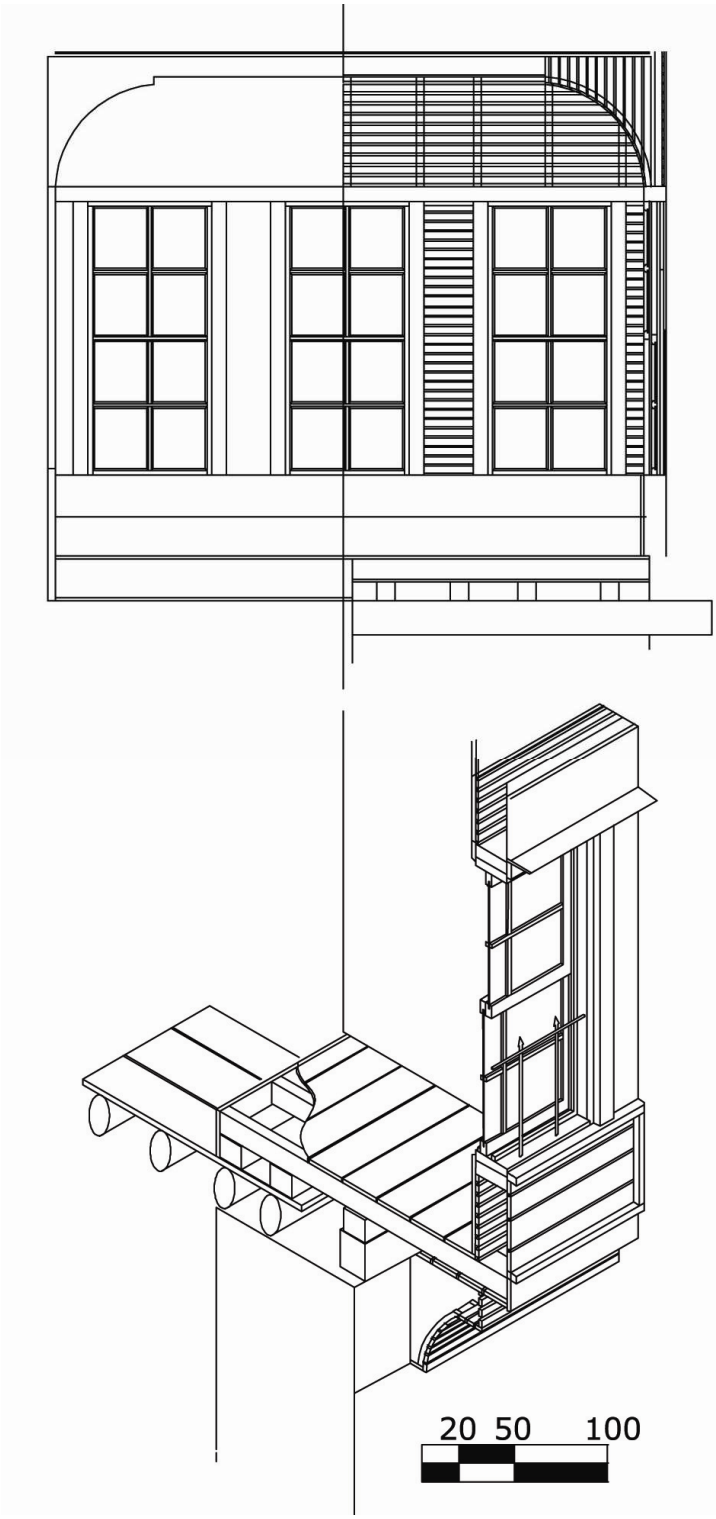


Figure 4. 34 Drawing of the projection type 2 Çelik 2008.

Figure 4. 35 Detail from the the projection type 2 Çelik 2008.

Figure 4. 36 Detail from the the projection type 2 Çelik 2008.

4.1.2.5 CEILING *STRUCTURE*

The ceilings of the ground floors that are the service spaces are not covered. In these spaces, the floor girders of the upper floor are left open.

Figure 4. 37 Detail from the ceiling Type 1. Çelik, 2008.

The second type is composed of finely shaped timber boards measuring 2cm by 25cm between the boards there are long narrow strips of wood. The meeting points of timber boarding which lay longitudinally from wall to wall are covered with timber elements having 3-4 cm thickness. At the end portions, one row of timber boarding is constructed parallel to wall surfaces establishing a frame around the ceiling area.

Figure 4. 38 Detail from the ceiling Type 2. Çelik, 2008.

The third group timber ceiling includes the plywood constructions. Its construction technique bases on rectangular plywood sheets nailed onto rectangular timber frame elements with 3-4 cm thickness.

Figure 4. 39 Detail from the Type 3. Çelik, 2008.

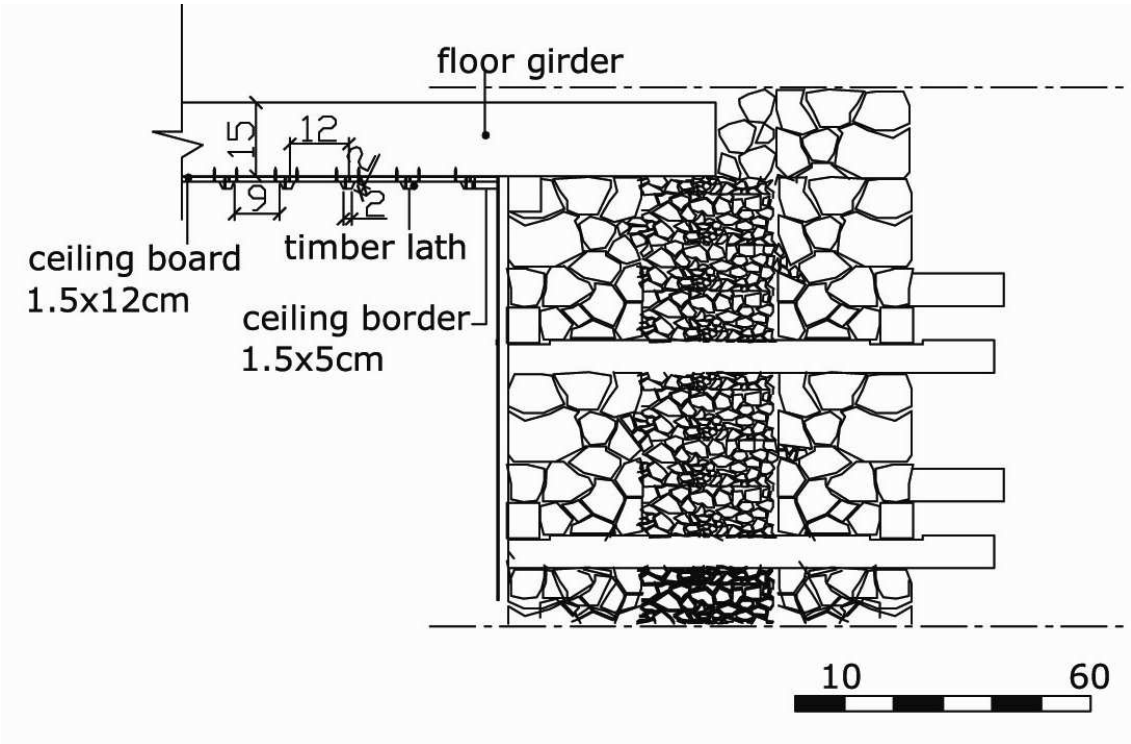


Figure 4. 40Drawing of the ceiling covering. Çelik 2008.

4.1.2.6 ROOF *STRUCTURE*

Roof of the Gümüşler House and House of the Municipality are timber structure. They are gable roofs with beams and rafters. The beams are roughly shaped with circular cross sections. The rafters are roughly cut shaped with rectangular cross section of approx. 10cm. By starting from the top of walls, rafters are placed regularly in each 50cm. The eaves are project 40 cm on the facades and the bottom of the eaves are not covered.

The roofing has "over and under tile" roof tile finishing which are lying parallel to the inclination direction of the roof facades. Nevertheless,

the original tiles of the roofs were altered with "*french*" type of tiles in the some parts of the houses. They are applied onto the timber boarding which are called bead placed over vertical to the direction of the rafters. Between the beads are covered with timber boards that are finely shaped with rectangular cross section of 2x8 cm. Those boards are nailed to the rafters.

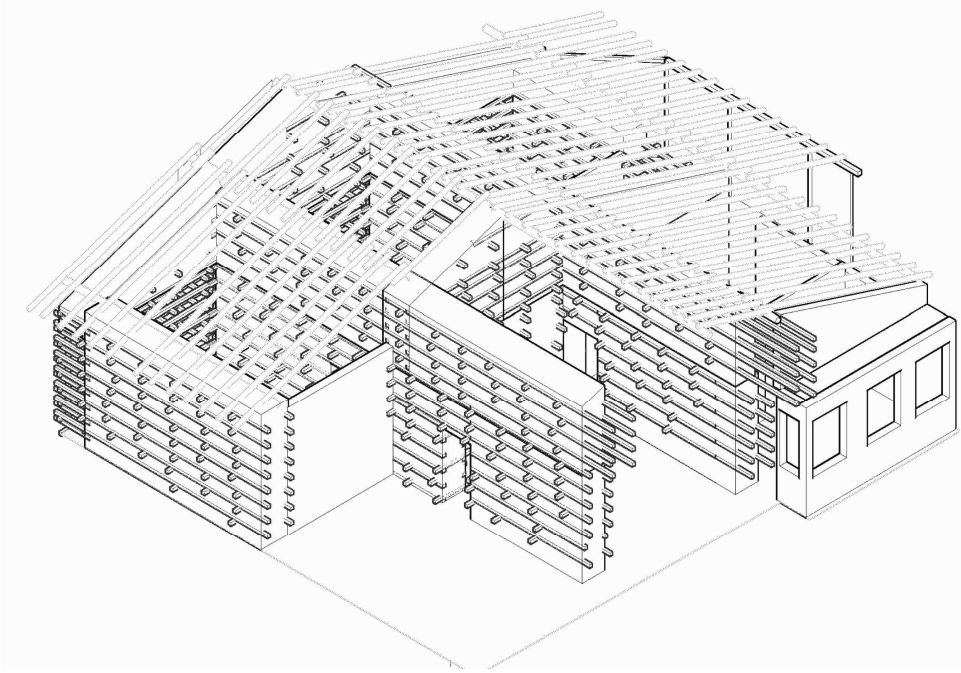


Figure 4. 41 Axonometric view of the roof structure. Çelik 2008.

Figure 4. 42 Detail from the roof-wall connection. Çelik 2008.

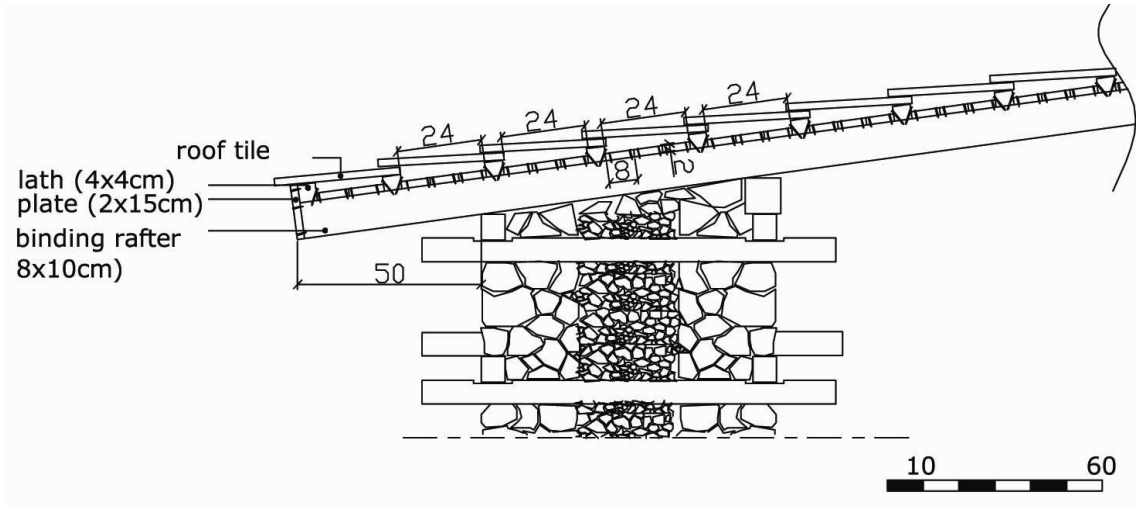


Figure 4. 43 Drawing of the roof-masonry wall connection. Çelik 2008.

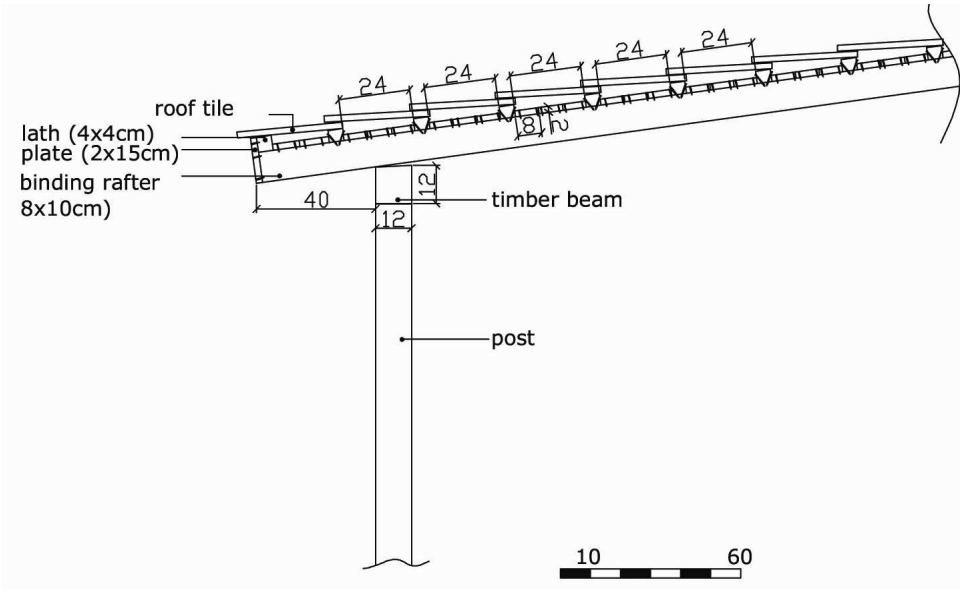


Figure 4. 44Drawing of the roof- timber wall connection. Çelik 2008.

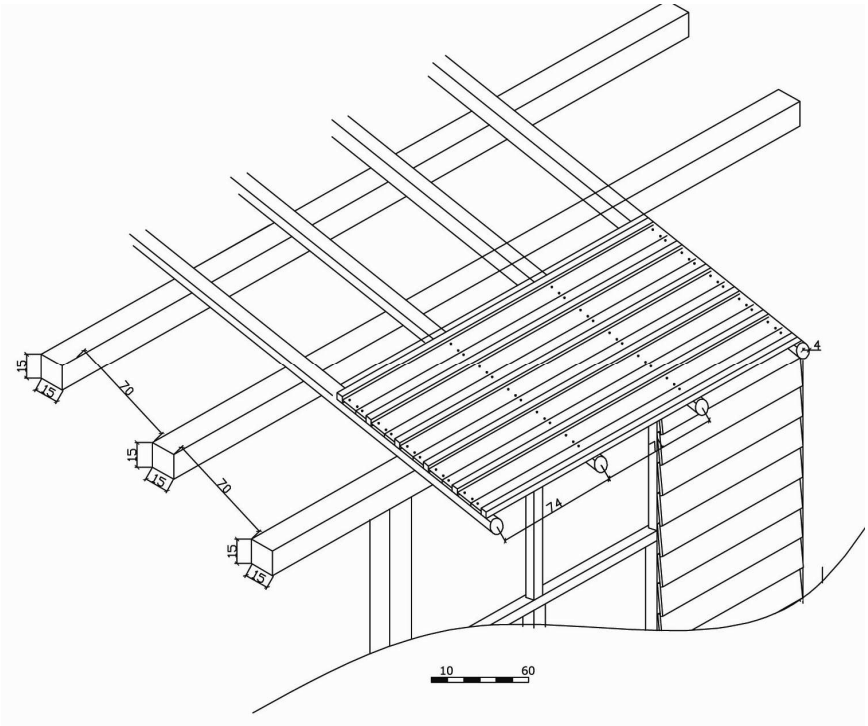


Figure 4. 45 Axonometric view of the roof. Çelik 2008.

4.2. ARCITECTURAL ELEMENTS

4.2.1 DOORS

4.2.1.1 Exterior doors

Courtyard doors

Courtyard doors are two-wing panel doors, which are called "*borta*". Dimensions of these doors are approximately 250x215 cm. These doors are made of solid timber, and the stiles and rails being fixed together either by mortise and tenon joints (with wedges). Mortise and tenon joints are used to ensure maximum strength and longevity. The framework is made of rails, stiles and panels. The vertical parts are stiles, and the horizontal parts are rails. The number of panels may vary.

The front face and the back face of the doors are different. At the front face, panels and the rails that connect the panels are seen. The vertical timber boards connected with nails to these panels and rails are seen at the back face of the doors. Timber boards are laid edge to edge and held together by stout battens at the back which are called bar.

There is a timber roof over the door to protect it from the rain, which is covered with timber boards called as "*hartama"* technique. The locks of the door are composed of four elements: two timber notched laths nailed to the bars of the one side of the doors, one timber element that is attached vertically to those notched spaces and an element that one side is nailed to the roof of the courtyard door and above the door wing and the other side is notched. When the vertical part moved

upwards the loose part nailed to the beam moves upward and the door wing got loose from the notched saddle and opens.

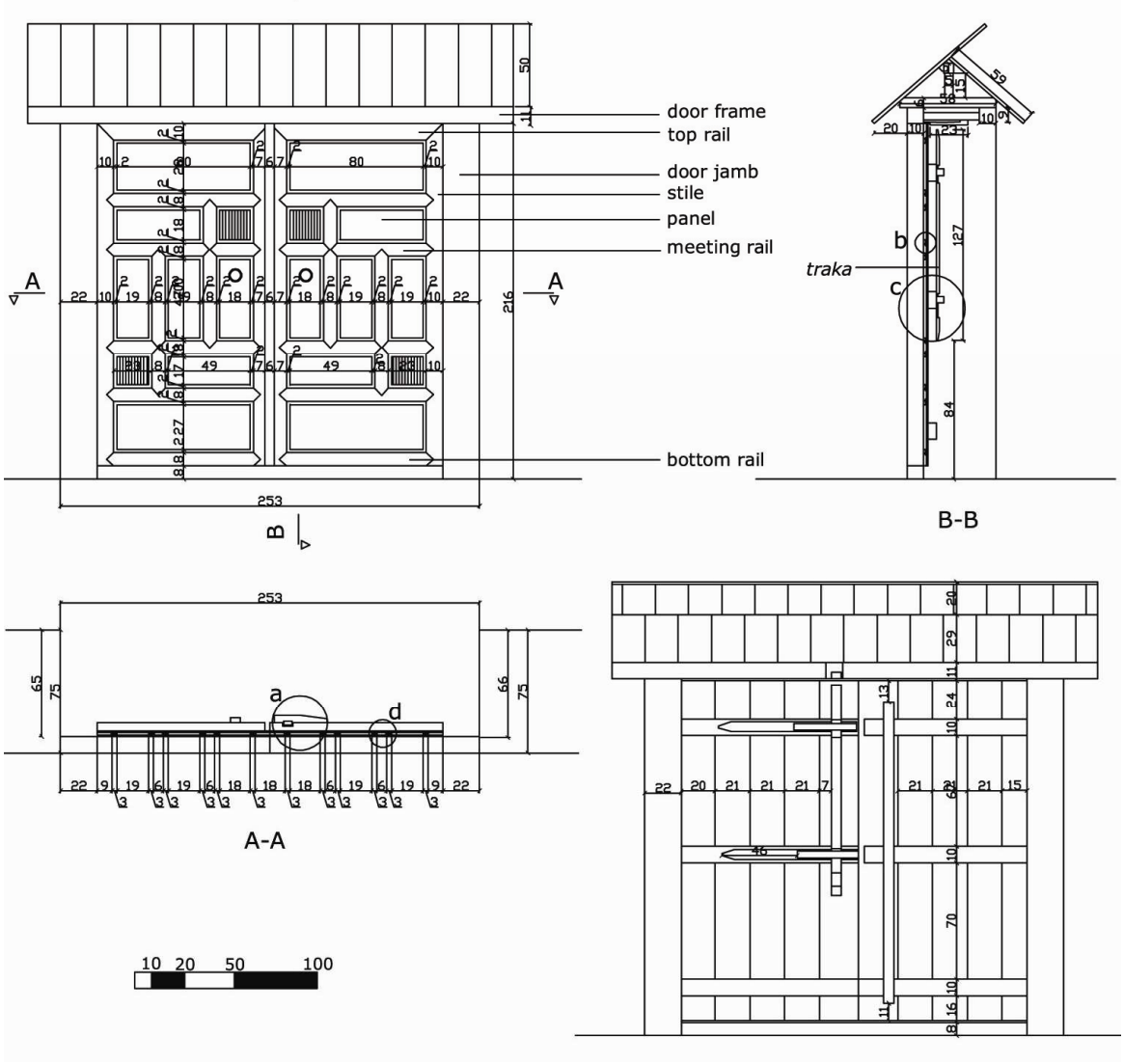


Figure 4. 46 Drawing of the courtyard door. Çelik 2008.

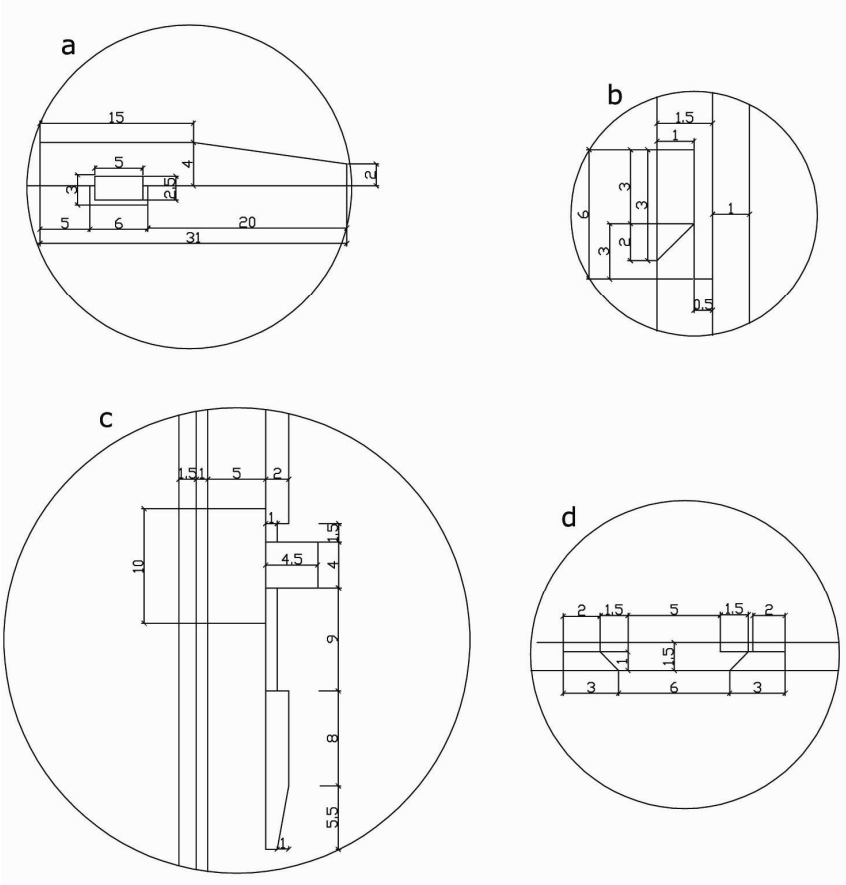


Figure 4. 47 Details of courtyard door. Çelik 2008.

Figure 4. 48 Front and rear views of the courtyard door.Çelik 2008.

Main doors

Type1

These main doors are two-wing panel doors. Dimensions of these doors are approximately 260x250 cm. These doors are made from pieces of solid timber panels, the stiles and rails being fixed together either by mortise or tenon joints (with wedges). The framework is made of rails, stiles and panels. The vertical parts are stiles, and the horizontal parts are rails.

Timber panels are laid edge to edge and they are fixed to stiles and rails either by mortise and tenon and also held together by stout battens at the back which are called bar.

These types of doors also have a top window that has a grille. Grilles are nailed to the frame of the door at the bottom and are nailed to the beams of the projection.

Figure 4. 49 Front and rear views of the main door.Çelik 2008.

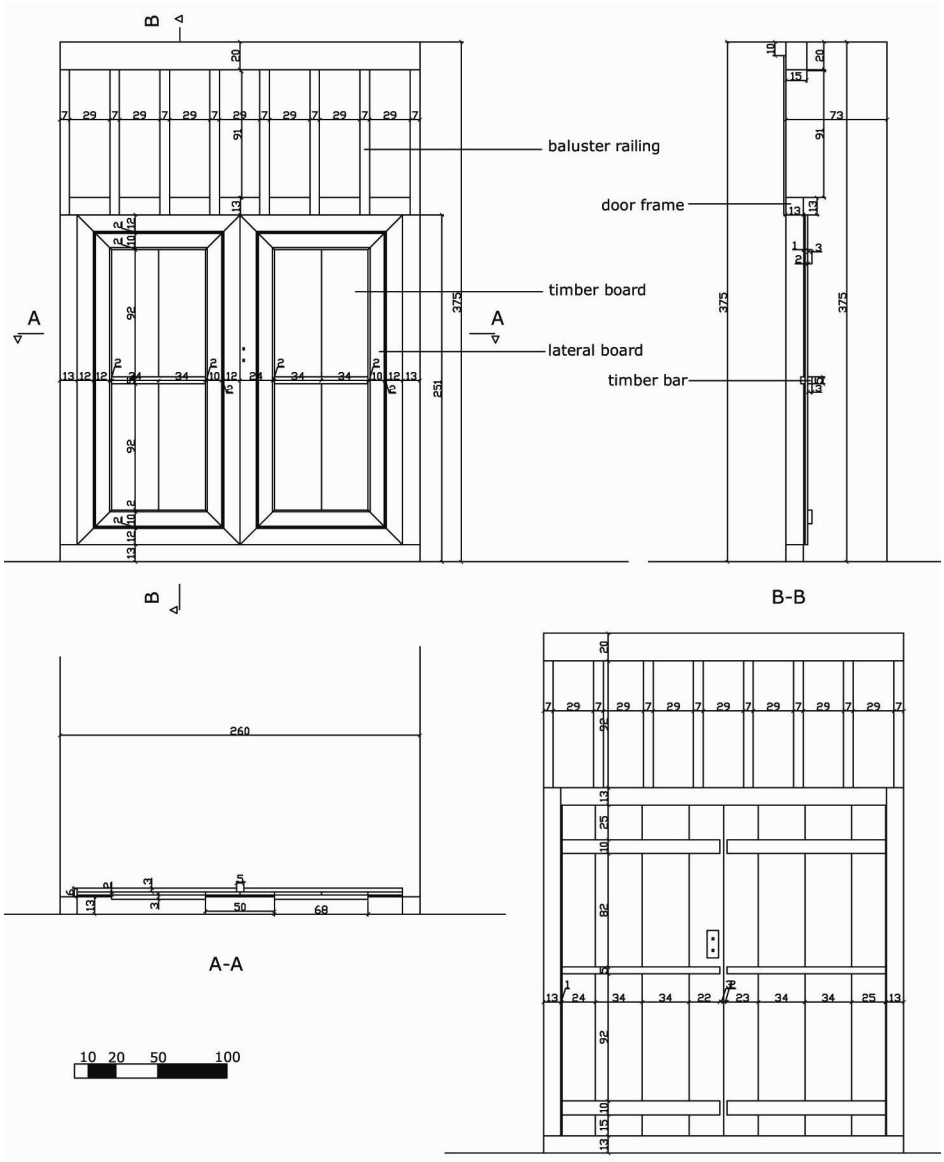


Figure 4. 50 Drawing of the main door type 1. Çelik 2008.

Type 2

This main doors is panel door which is 123cm in length and 275cm in height, and they are made from pieces of solid timber, the stiles and rails being fixed together either by mortise and tenon joints. Building the door starts with the construction of the frame, then timber panels are laid edge to edge and they are fixed to stiles and rails either by mortise and tenon and also held together by stout battens at the back which are called bar

In addition, there are door hinges in this door. Door wings are hooked to the doorframe with door hinges at three points.

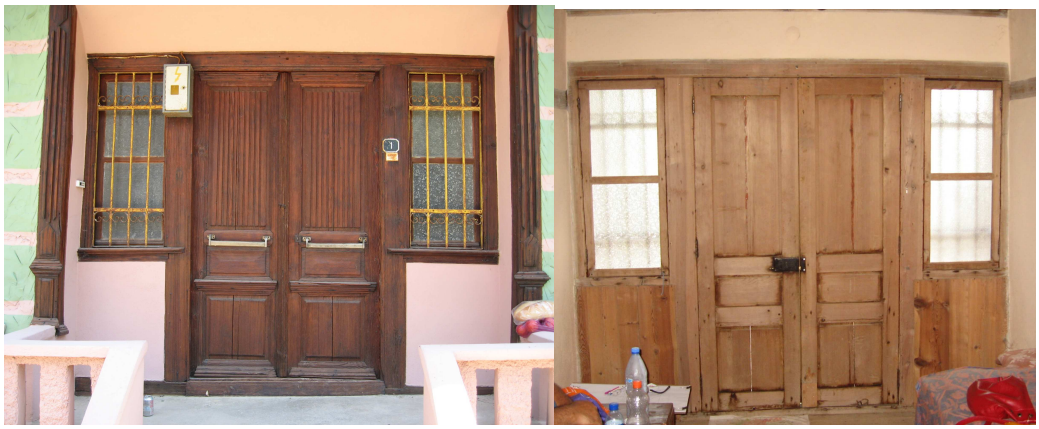


Figure 4. 51 Front and rear views of the main door.Çelik 2008.

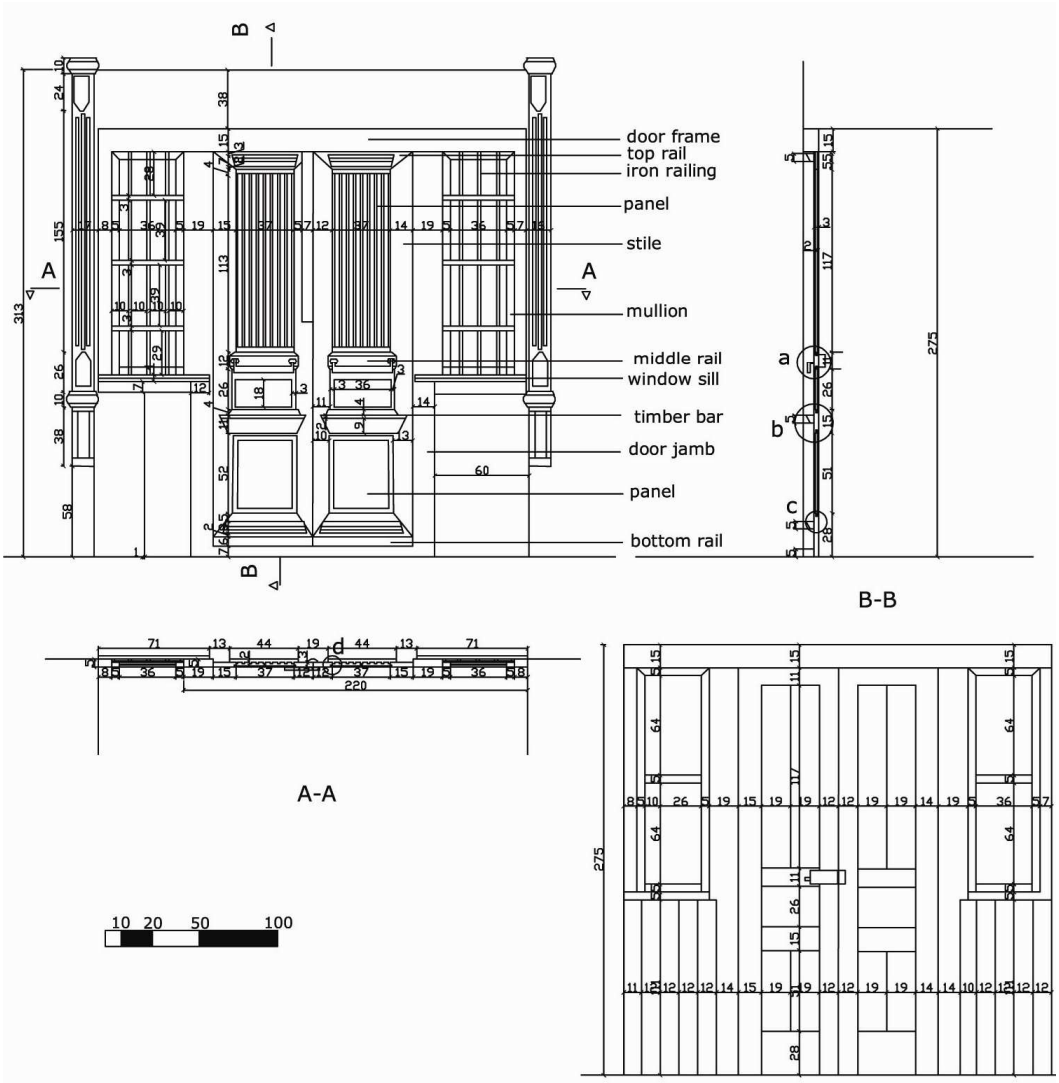


Figure 4. 52 Drawing of the main door type 2. Çelik 2008.

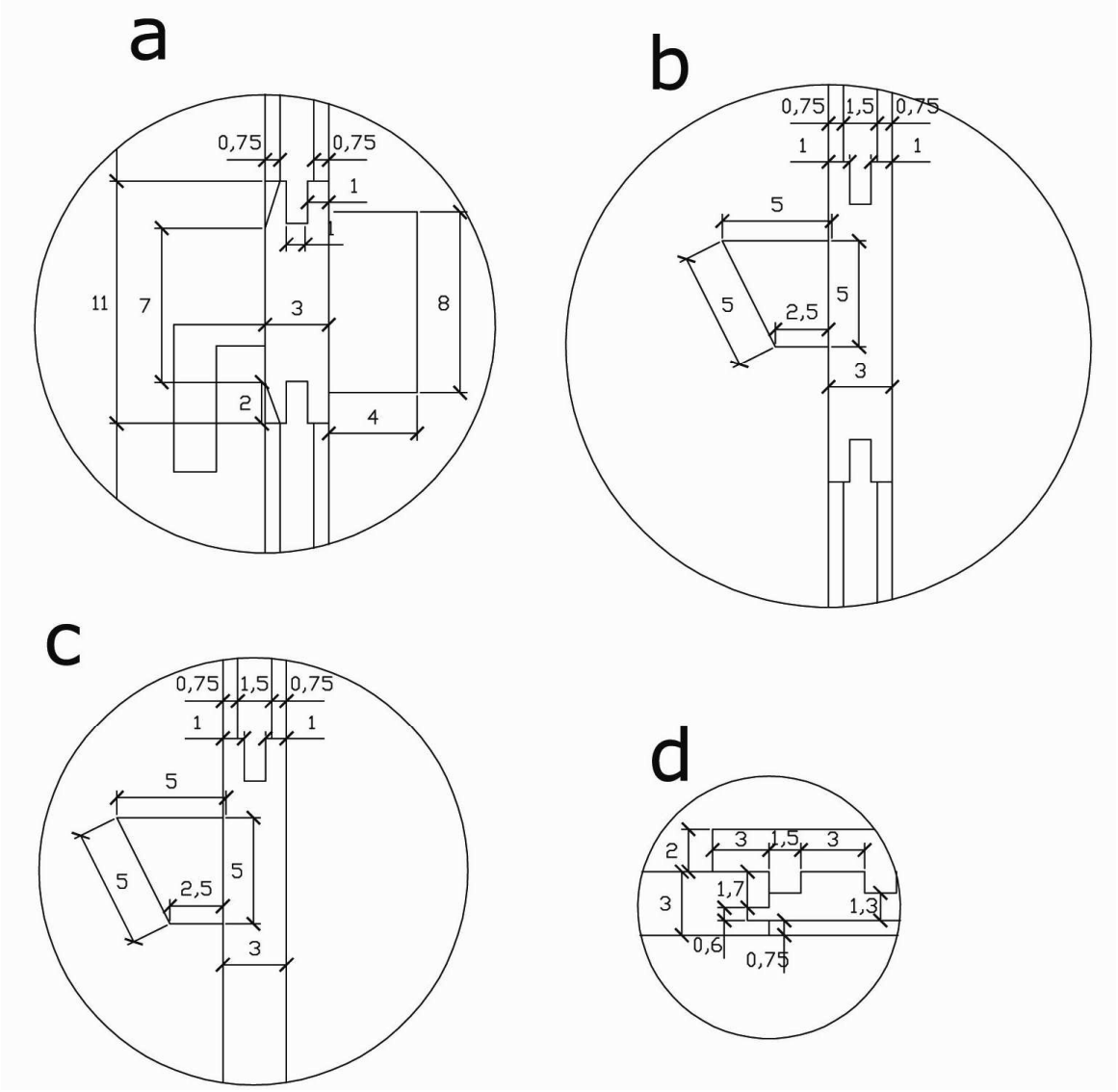


Figure 4. 53 Details of the main door-type2Çelik 2008.

4.2.1.2 Interior doors

Type1

These types of doors called as board-and-batten doors. This type of door is made from timber boards are laid edge to edge and held together and by stout battens at the back which are called bar.

To leave opening in the wall, first, the timber elements are inserted at the sides of the openings, and then the framework of the openings is fixed at the edges. The timber lintels are five or six in number, which are placed throughout the thickness of the wall. These lintels with a cross section 7x7 cm. were placed as spanning elements at the top of the opening; undersides of them are covered with timber boards.

Figure 4. 54 Detail from the top of the interior door-type 1. Çelik 2008.

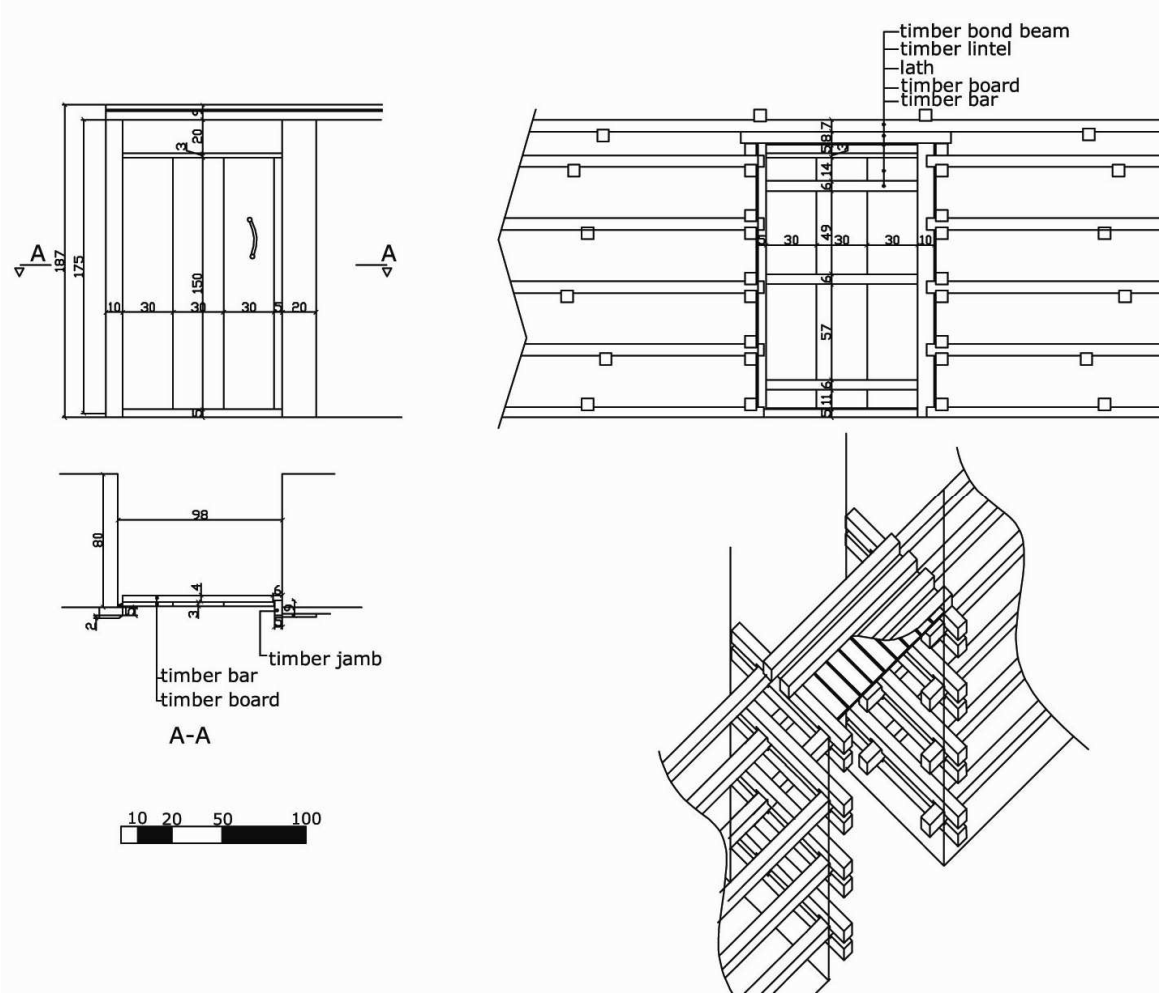


Figure 4. 55 Drawing of the interior door type 1. Çelik 2008.

Type 2

This interior doors is panel door which is 92cm in length and 190cm in height, and they are made from pieces of solid timber, the stiles and rails being fixed together either by mortise and tenon joints. Building the door starts with the construction of the frame, then timber panels are laid edge to edge and they are fixed to stiles and rails either by

mortise and tenon and also held together by stout battens at the back which are called bar

To leave opening in the wall for the placing the door, first, the timber elements are inserted at the sides of the openings, and then the framework of the openings is fixed at the edges. The timber lintels are five or six in number, which are placed throughout the thickness of the wall. These lintels with a cross section 7x7 cm. were placed as spanning elements at the top of the opening; undersides of them are covered with timber boards

There are usually no doorknobs in these types of doors. Instead of doorknobs a local type of lock called as "traka" is used. Traka is a mechanism that is a crack carved to mobile part of the doorframe and works as the movement of springy timber part behind that crack and freeing the door wing.

To the wall at the right side of the door 17 cm right side of the door frame and 18 cm above the ground an enter for cats with a diameter of 6 cm was opened.

In addition, there is no door hinge in this door. Door wings are hooked to the doorframe with wrought iron gudgeons at three points, which are at the same level with the bars.

Figure 4. 56 Front and rear view of the interior door type 2. Çelik 2008.

Figure 4. 57 Detail from the hole for cads. Çelik 2008.

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Figure 4. 58 Detail from "traka". Çelik 2008.

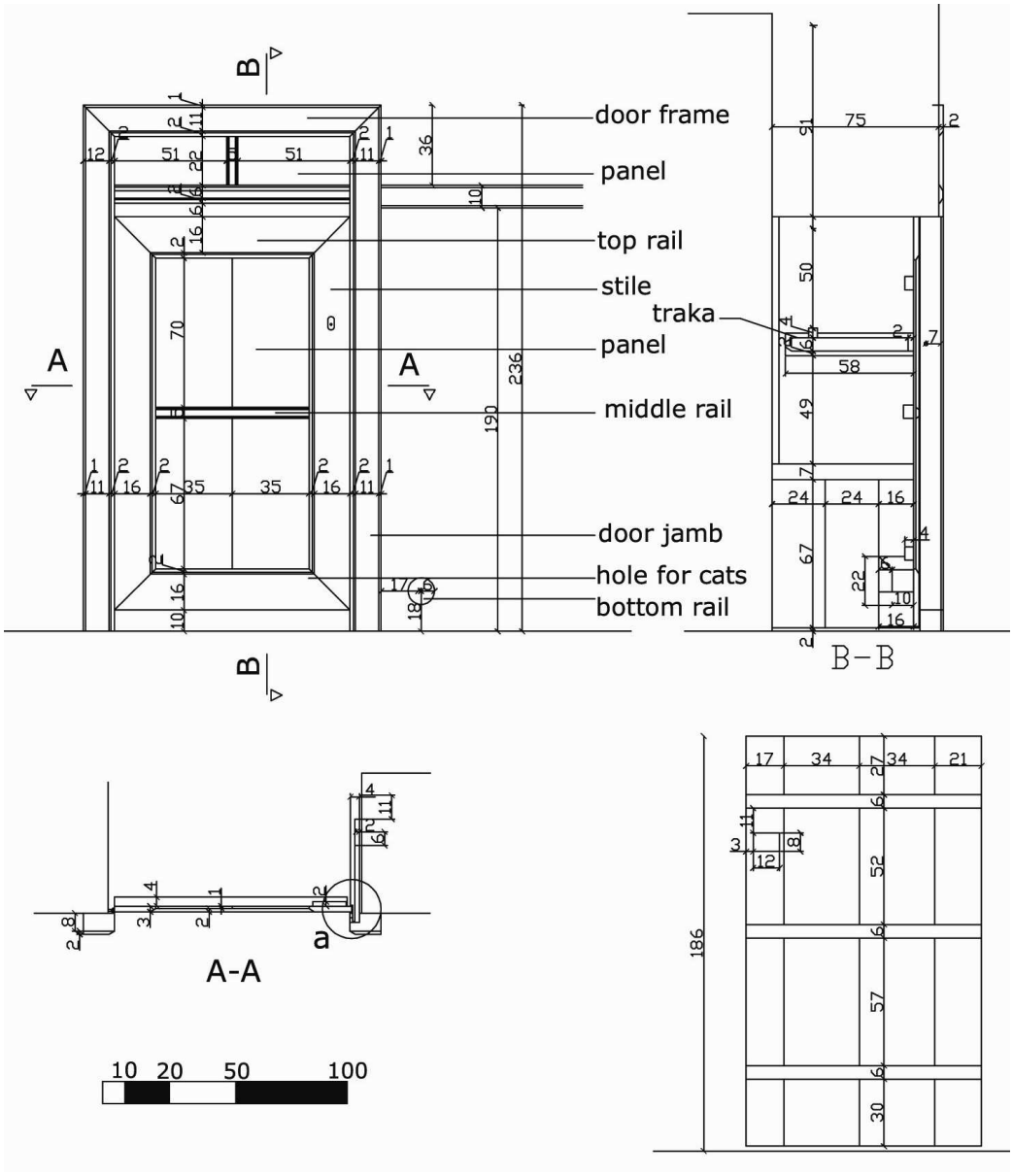

Figure 4. 59 Drawings of the interior door type 2. Çelik 2008.

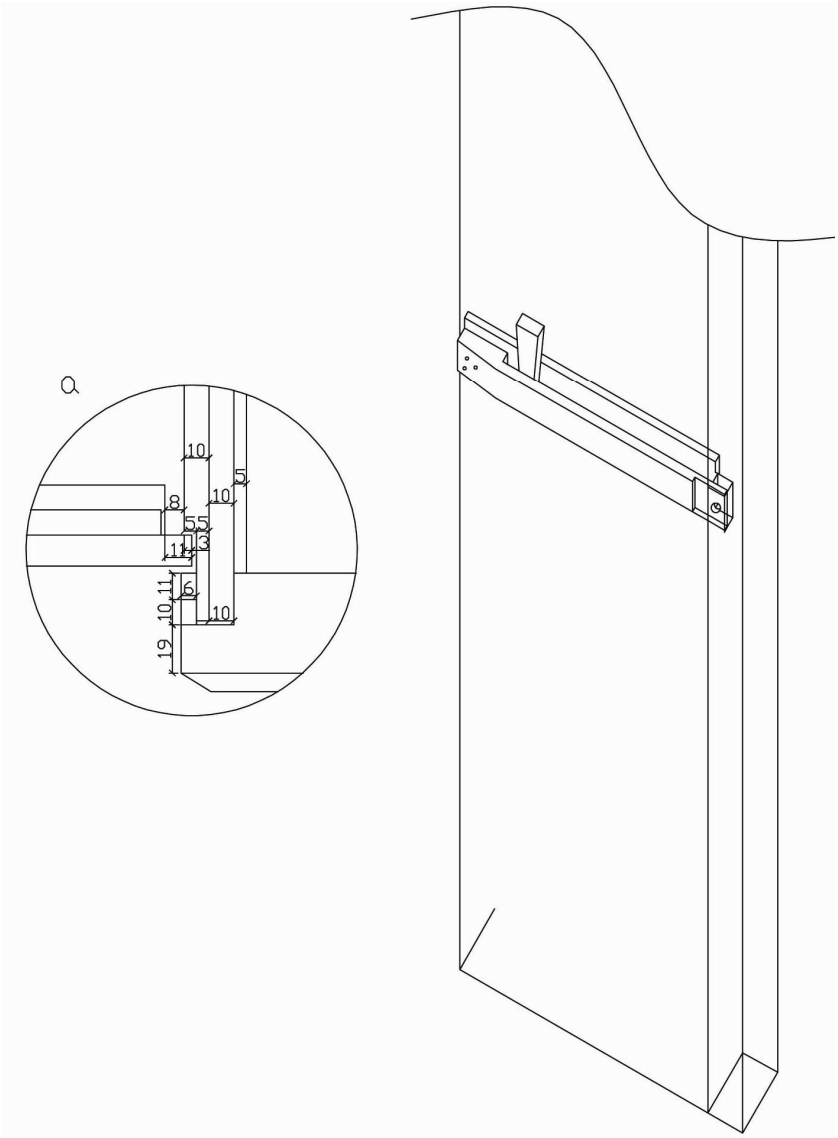

Figure 4. 60 Details of traka. Çelik 2008.

Type 3

This interior doors is panel door which is 99cm in length and 182cm in height, and they are made from pieces of solid timber, the stiles and rails being fixed together either by mortise and tenon joints. Building the door starts with the construction of the frame, then timber ornamented panels are laid edge to edge and they are fixed to stiles and rails either by mortise and tenon and also held together by stout battens at the back which are called bar

The front face and the back face of the door are different from each other. While the panels and the rails connecting panels can be seen at the front face, at the back face the timber boards where those panels and rails are nailed can be seen. Timber boards are laid edge to edge and held together and by stout battens at the back which are called bar.

In addition, there is no door hinge in this door. Door wings are hooked to the doorframe with wrought iron gudgeons at three points which are at the same level with the bars.

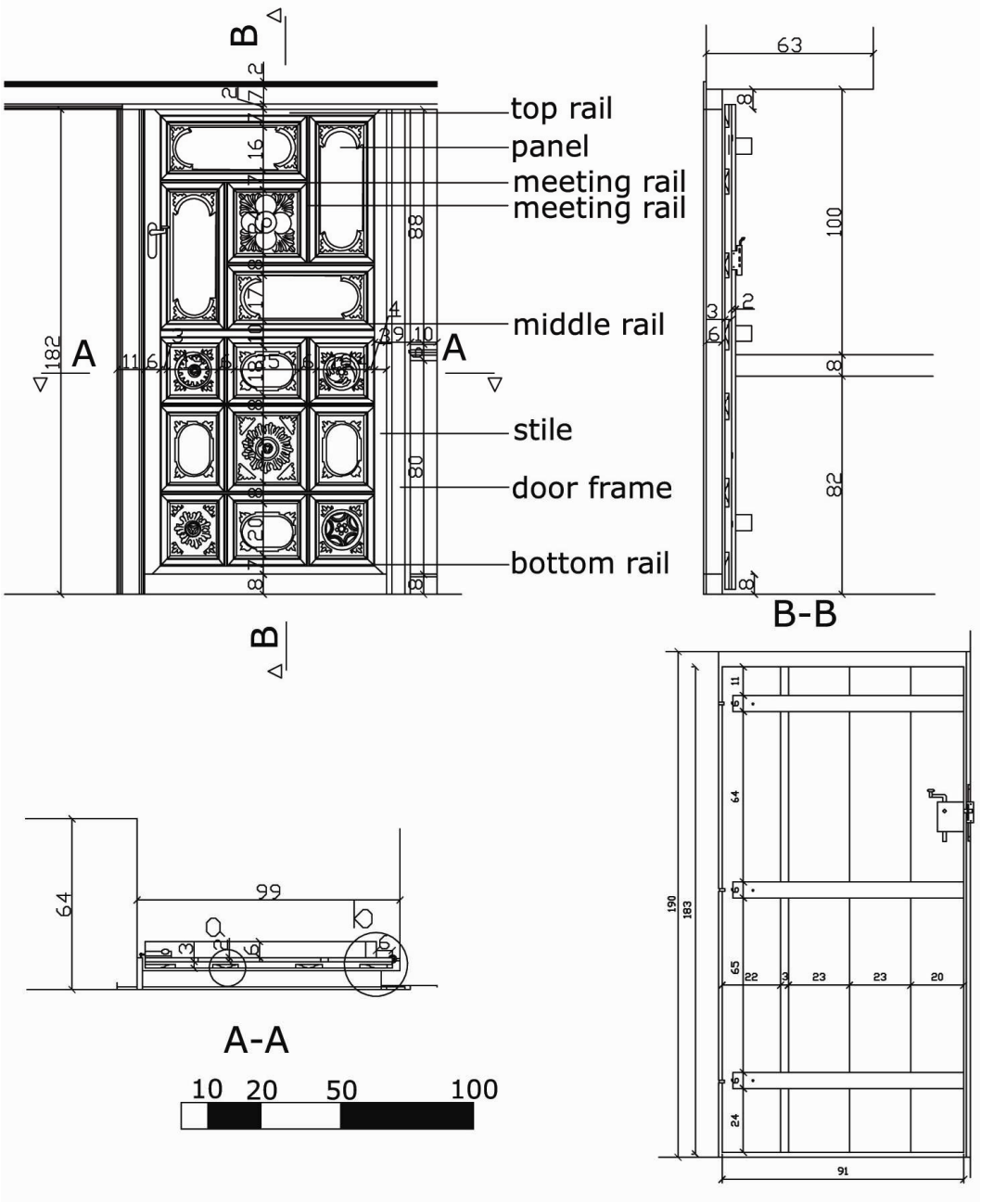

Figure 4. 61 Drawings of the interior door type 3. Çelik 2008.

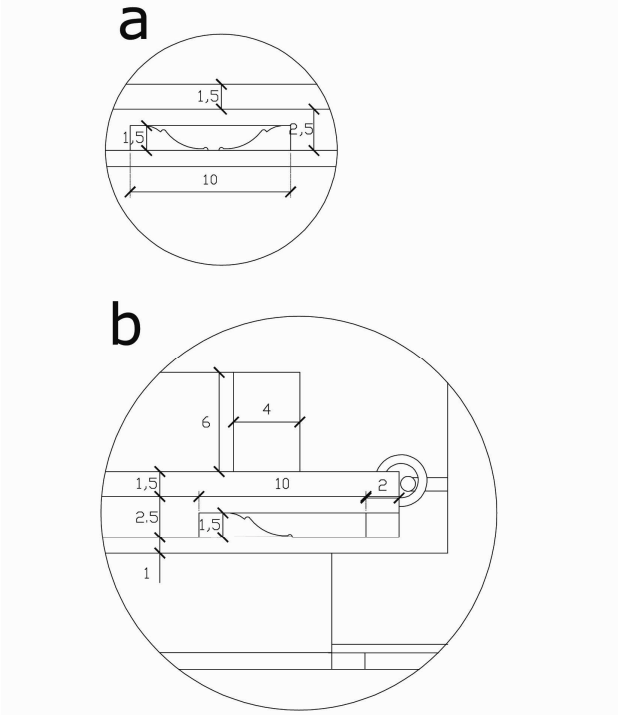

Figure 4. 62 Details of the interior door type3. Çelik 2008.

Figure 4. 63 Front and rear view of the interior door type 3. Çelik 2008.

Type 4

These interior doors are two-wing panel doors which is 94cm in length and 196cm in height, and they are made from pieces of solid timber, the stiles and rails being fixed together either by mortise and tenon joints. Building the door starts with the construction of the frame, then timber panels are laid edge to edge diagonally and they are fixed to stiles and rails either by mortise and tenon and also held together by stout battens at the back of the door which are called bar

There are no doorknobs at this door. Instead of doorknobs there is a lock composed of two parts; first part is a timber element 6 cm notched from the upside and nailed to the one of the door wing and the second part that is replaced to the circular hole of the other door wing. The mechanism works as the outward short part rotated the inward longer part moves upward and the door wings sets free.

In addition, there is no door hinge in this door. Door wings are hooked to the doorframe with wrought iron gudgeons at three points.

Figure 4. 64View from interior door type 4. Çelik 2008.

Figure 4. 65View from interior door type 4. Çelik 2008.

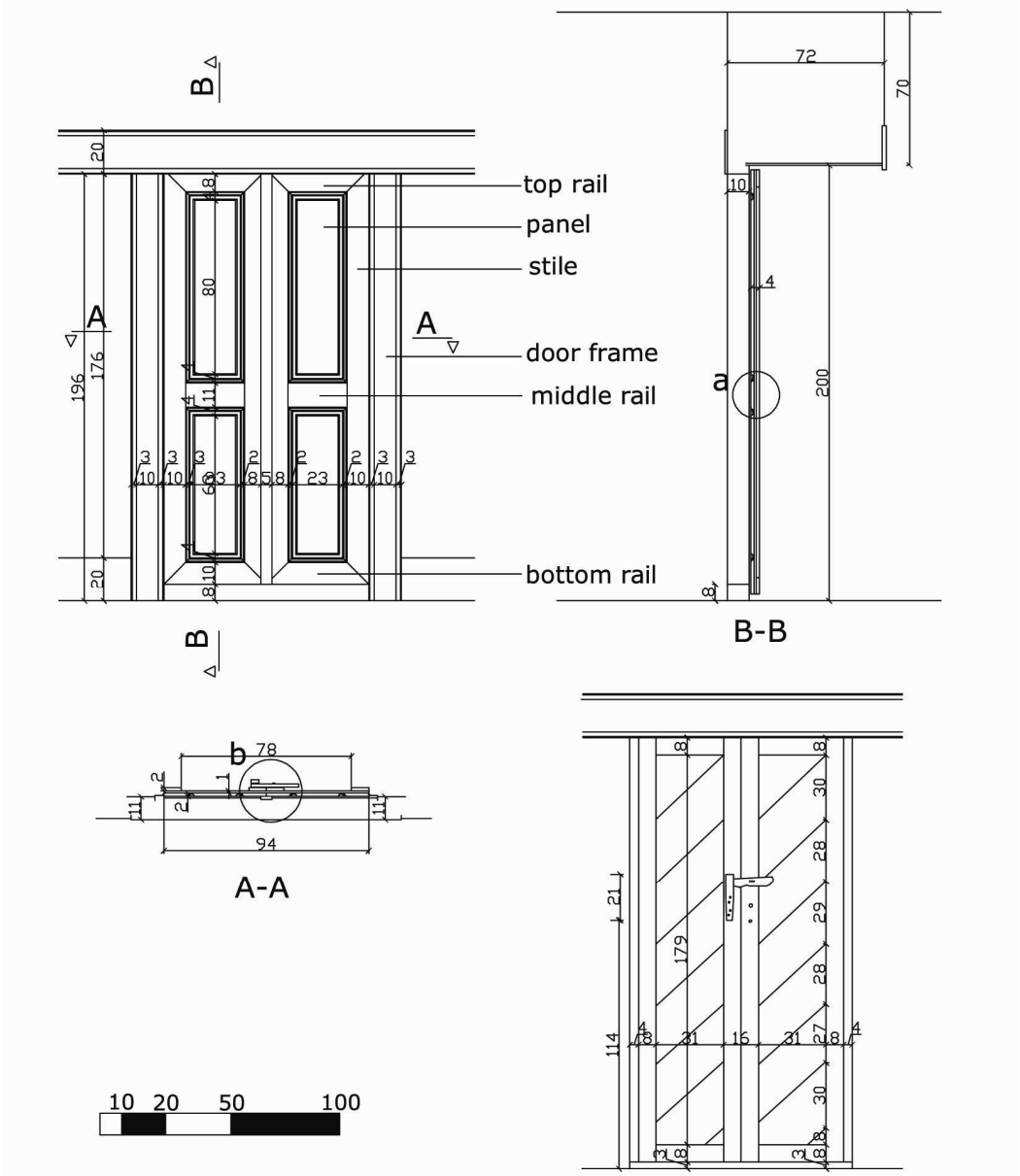

Figure 4. 66 Drawing of the interior door type4. Çelik 2008.

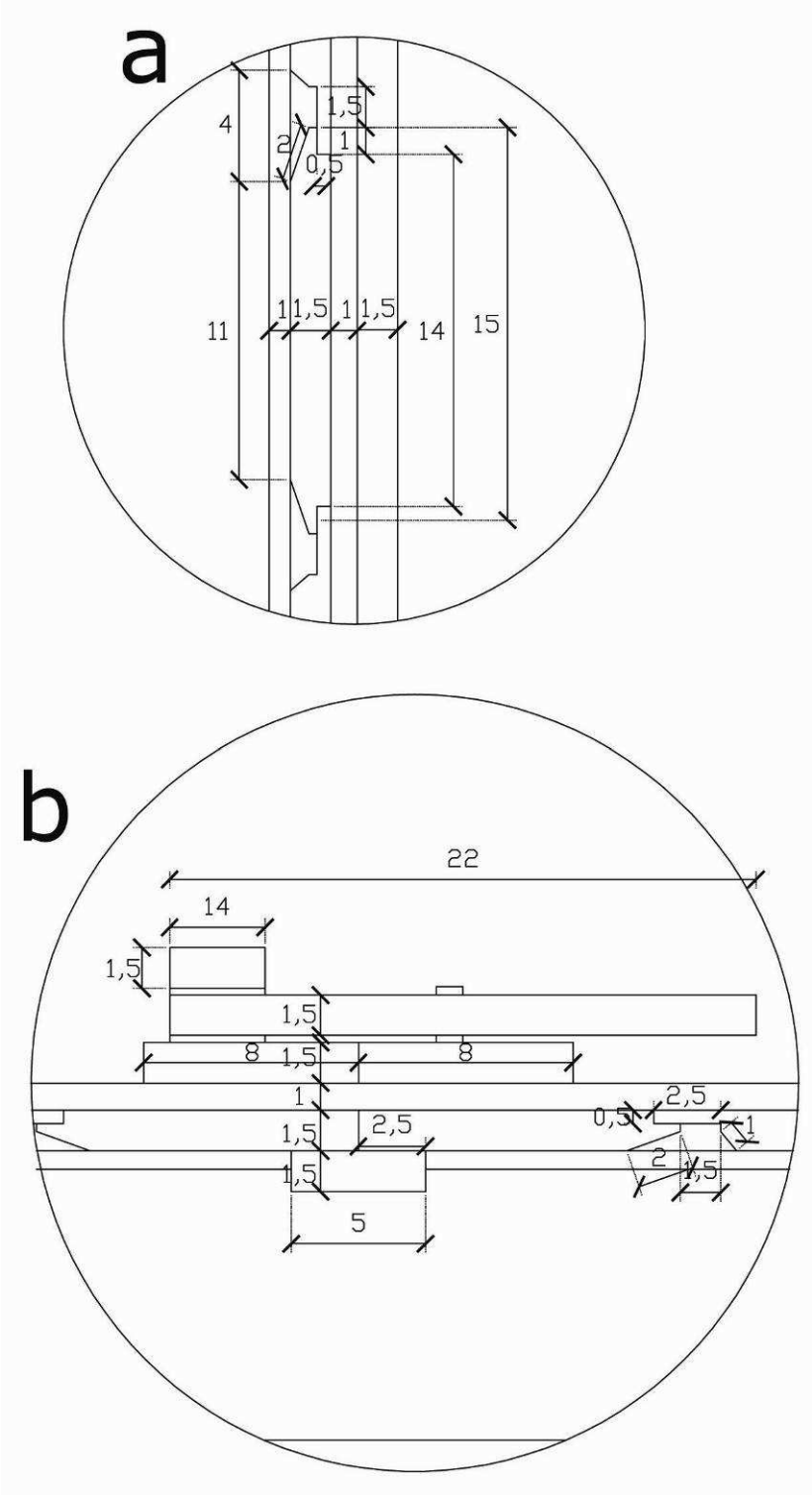

Figure 4. 67 Details of the interior door type 4. Çelik 2008.

4.2.2 WINDOWS AND SHUTTERS

These sash windows are made of one movable panels that form a frame to hold panels of glass. Sash may be divided into a number of lights by small wood members called muntins

Sash windows are fitted with hinges which allow the window to be locked into hinges on one side while the counterbalance on the other site is detached,

These windows are often fitted with timber shutters at the inside of the windows and these shutters are locked with *taraka* system. In addition there is iron grilles at the exterior side which are fitted on the jambs of the window.

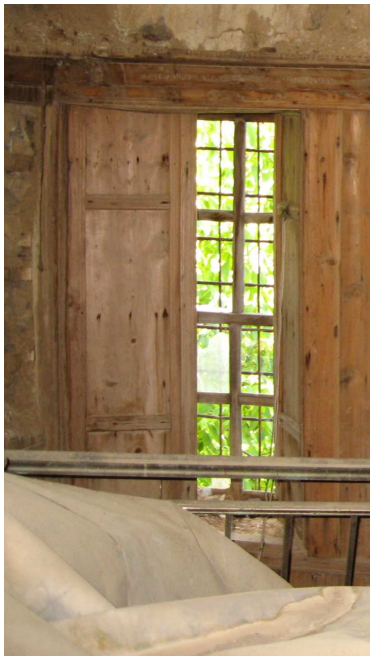

Figure 4. 68 View from a sash window with shutter. Çelik 2008.

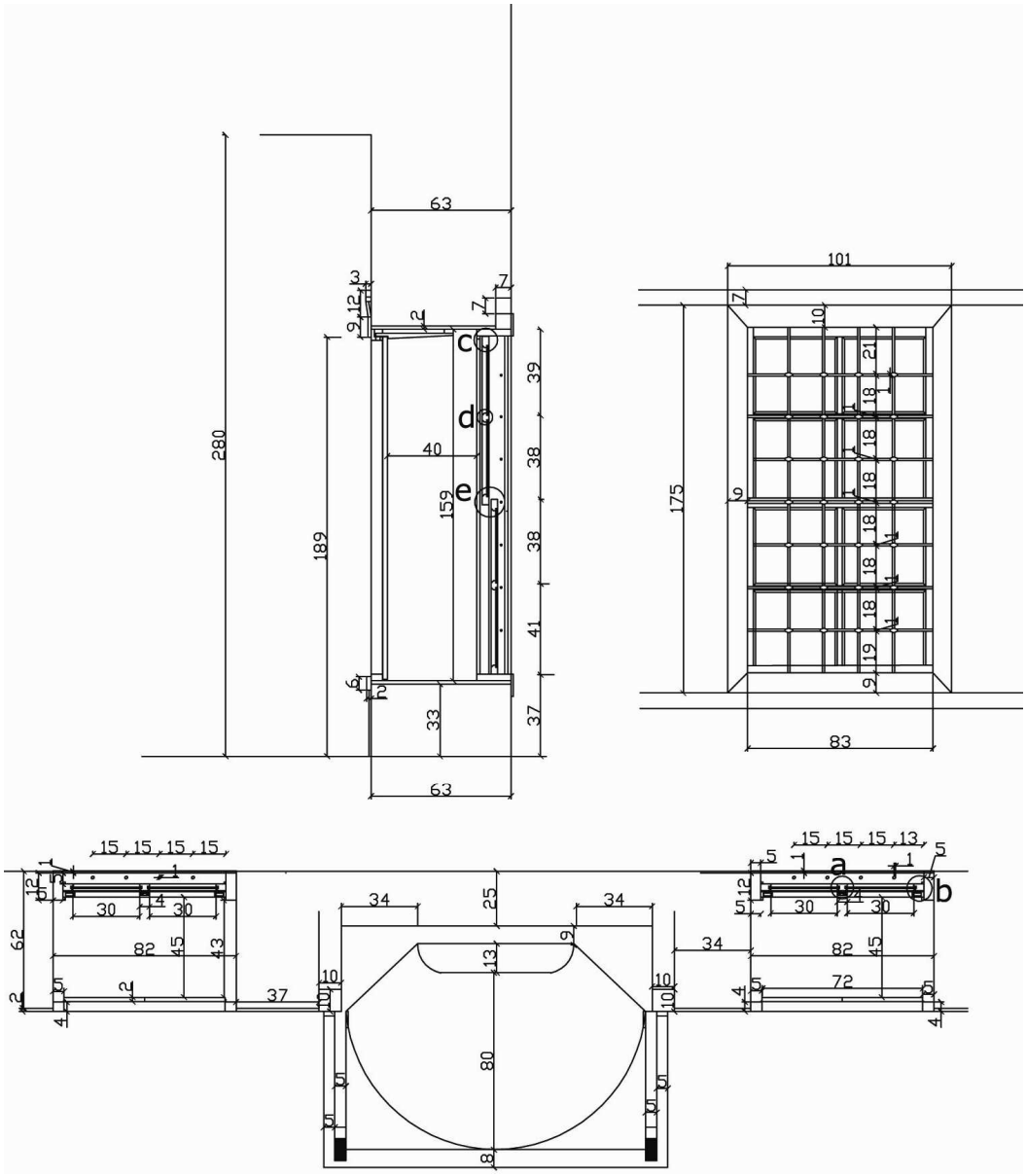

Figure 4. 69 Drawings of the sash window. Çelik 2008.

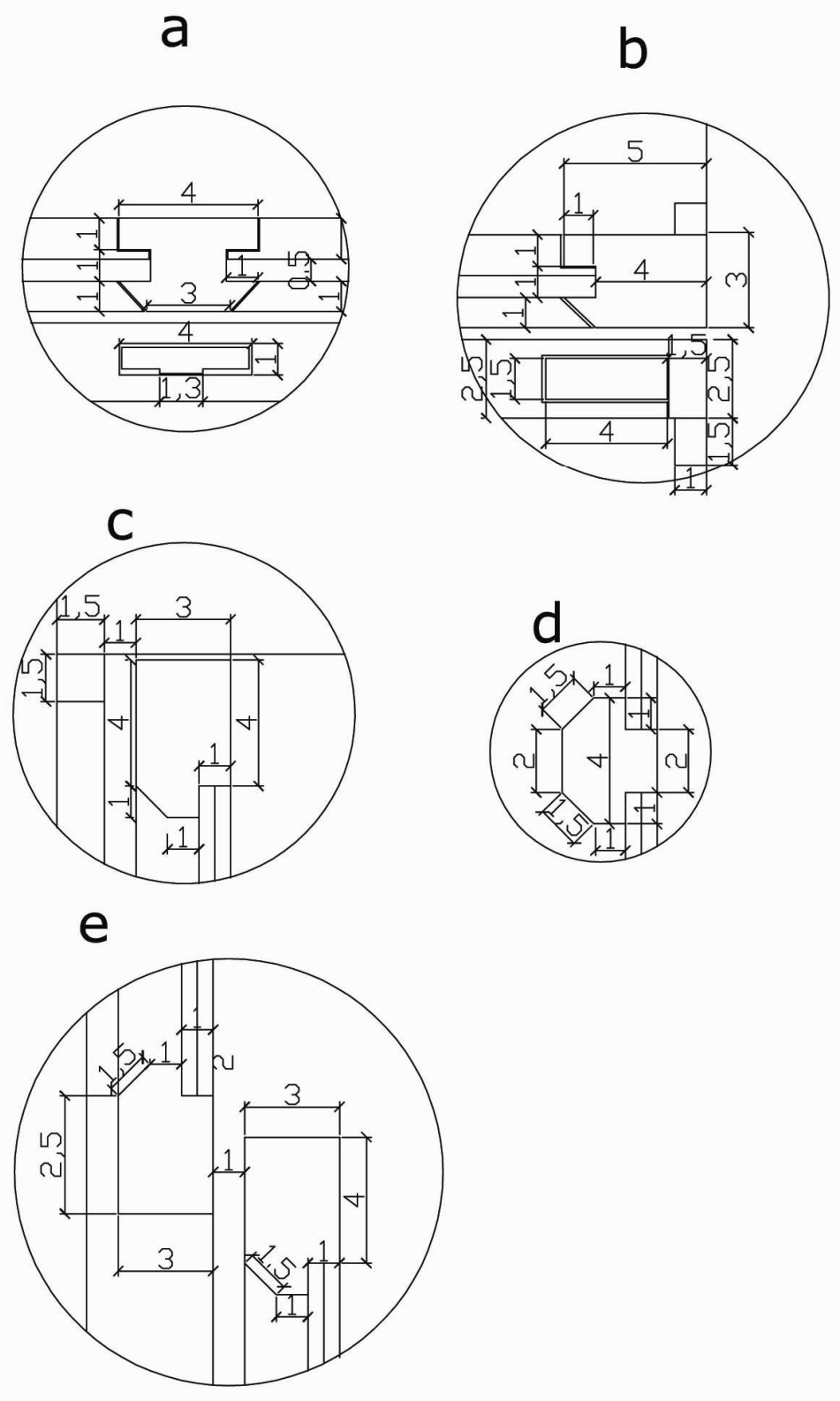

Figure 4. 70 Details of the sash window. Çelik 2008.

4.2.3 FIREPLACES

Fire places are constructed at two steps. First is leaving the opening in the wall, and then *yaşmak* of the fire place is fixed at the edges. Yaşmaks of the fire places are totally constructed by nailing the timber elements at the carpenter shop. There is no joinery at the connections of the edges of the *yaşmak*.

Figure 4. 71 View from fire place. Çelik 2008.

Figure 4. 72 Detail from fire place. Çelik 2008.

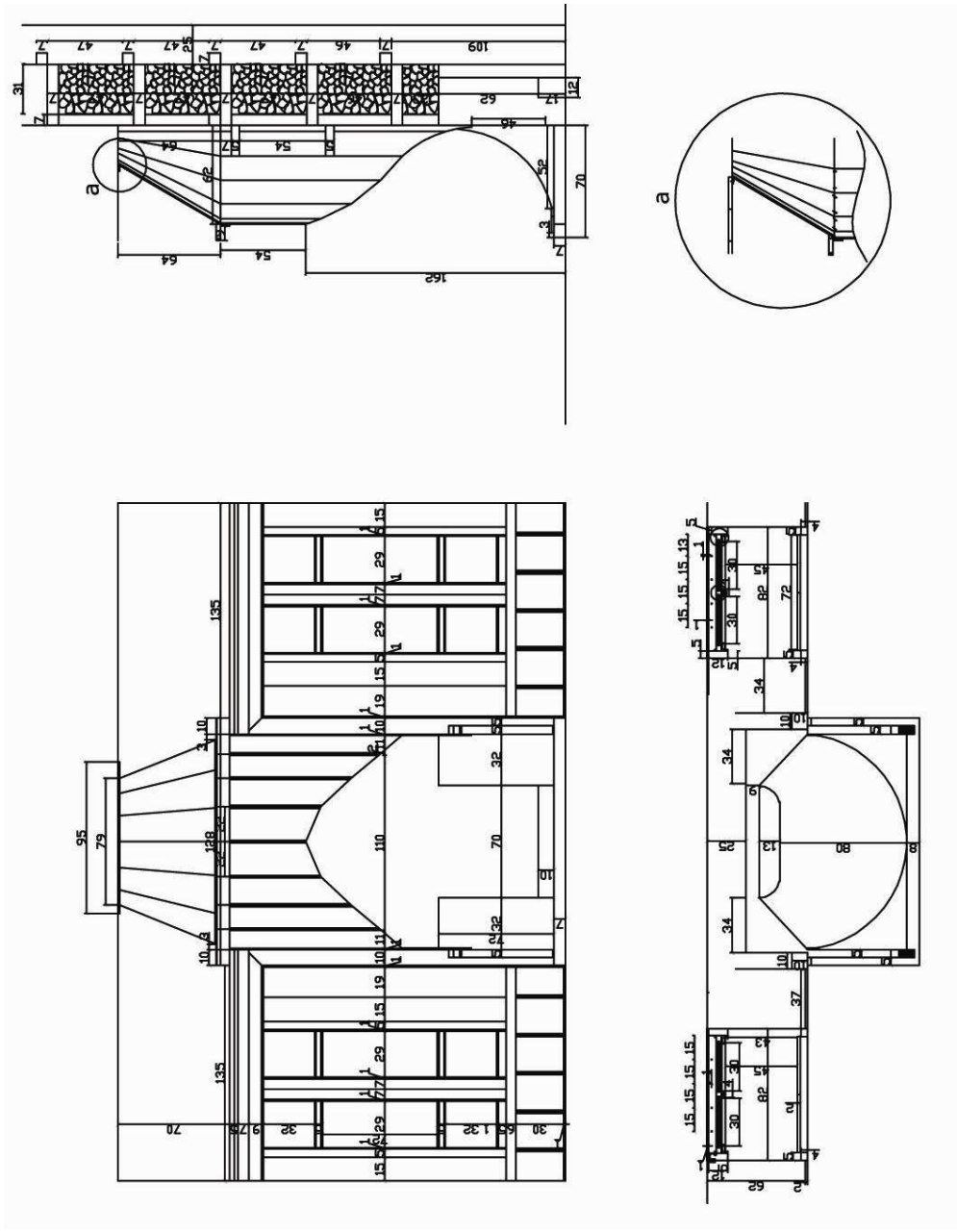

Figure 4. 73 Drawings of the fire place. Çelik 2008.

4.2.4 STAIRS

At the studied houses, all the stairs are timber and they are single. Each of the stairs has one landing whose length equal to the stair width.

Stair are constructed using solid timber stringers as support for the treads and risers.

First two steps of the stair are constructed with rubble stone and they are covered with timber boards. At the level of second riser, there is a landing where the stringers start without any jointing. The stringer that closes off the ends of the treads and risers is a closed stringer. One of the stringers is nailed to the pişţuvans of the wall and another one is supported by the timber posts. The end of the stringers is settle on floor beam of the upper floor.

Both of the treads and risers are housed in rebates in the stringer. Cavities of the risers on the stringer are chamfered deviated. Treads are supported by the timbers laths, which are nailed to the stringers and treads, are placed on both stringers and laths. In addition, bottom side risers are placed on over the treads. Nevertheless, treads are nailed to the top of the risers at five points and risers are nailed to the stringers.

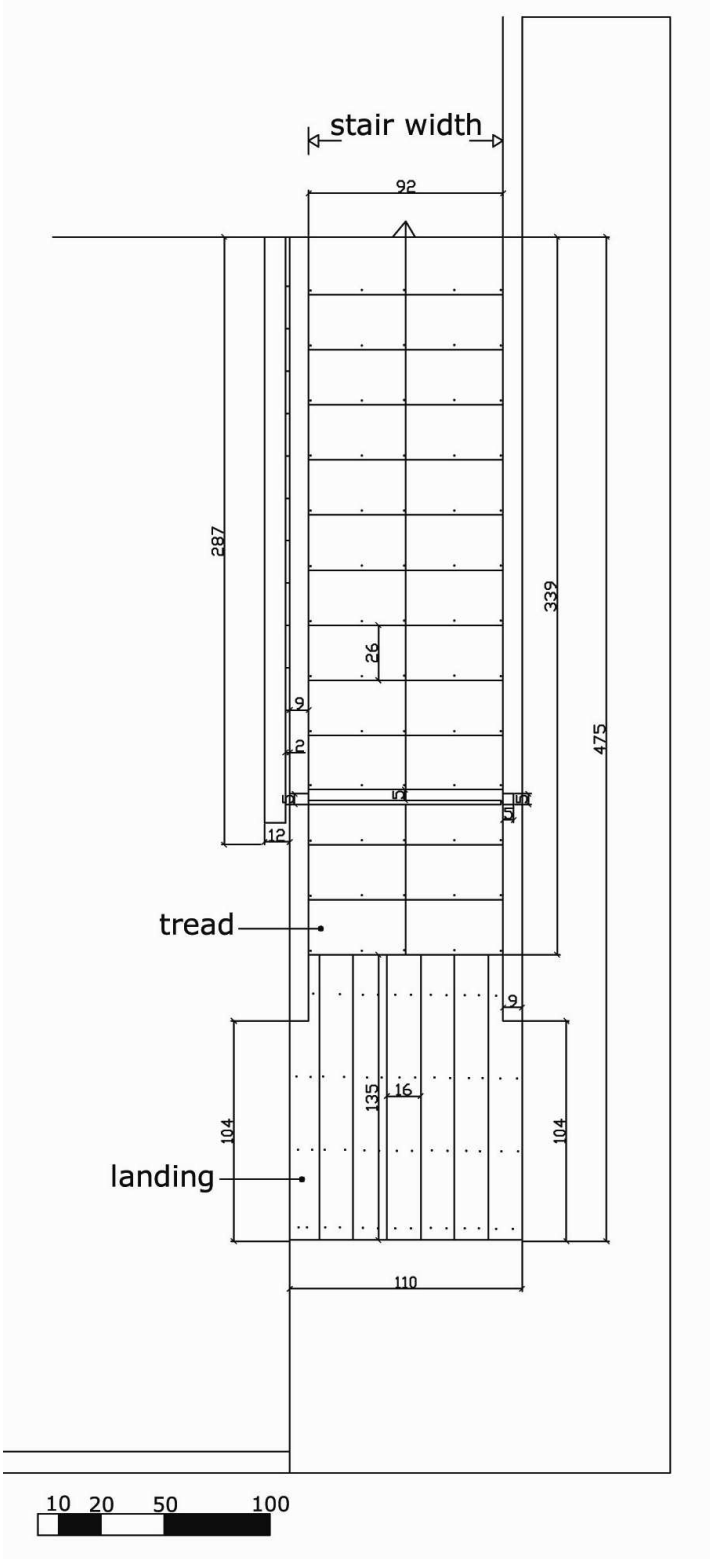

Figure 4. 74 Plan of the stair. Çelik 2008.

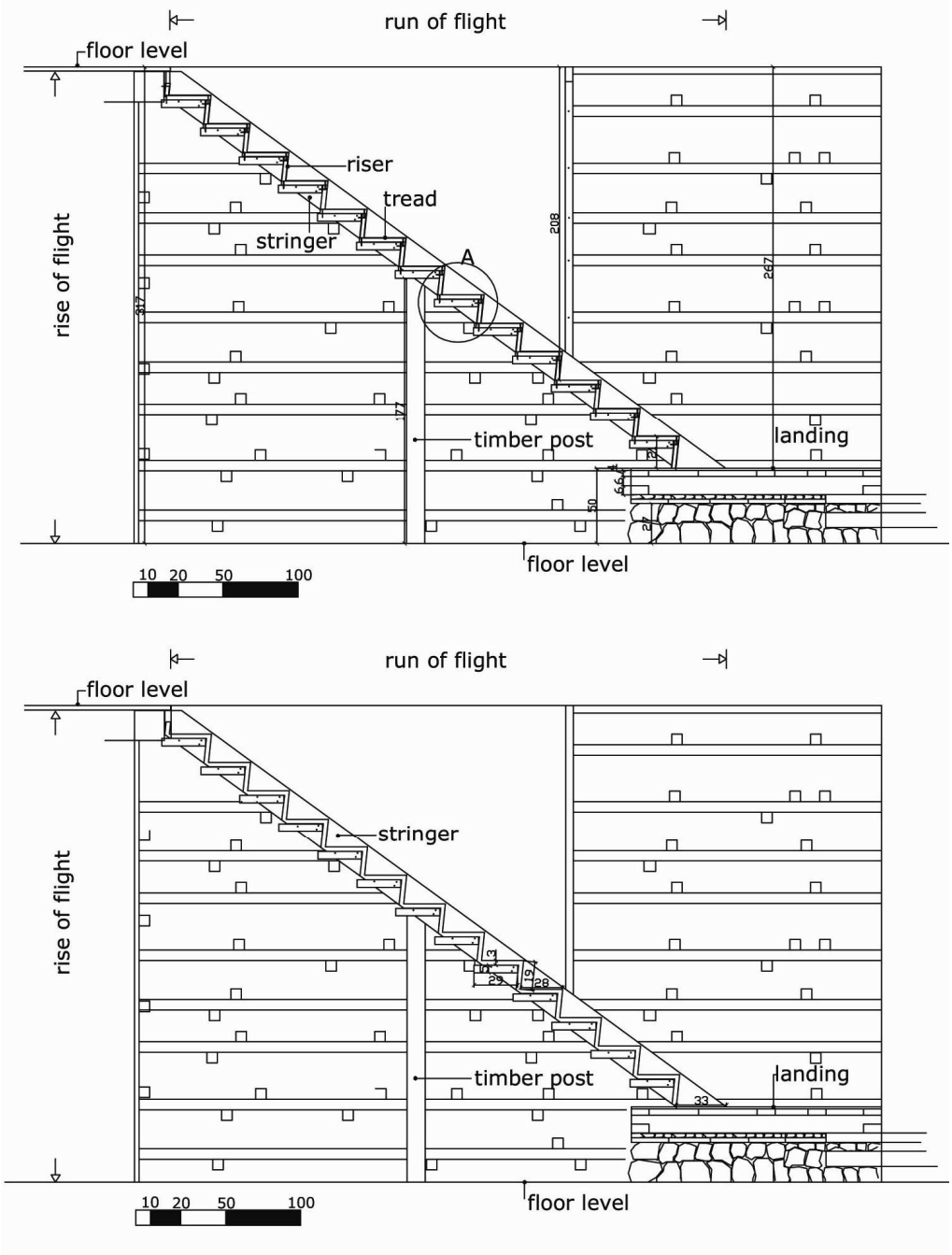

Figure 4. 75 Sections of the stair. Çelik 2008.

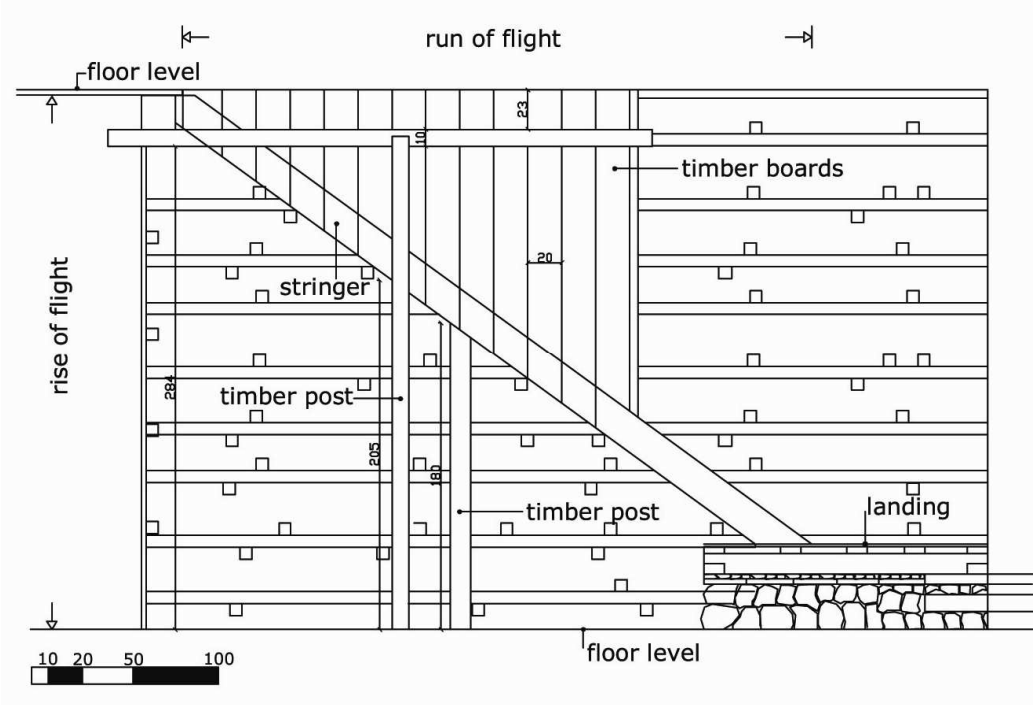

Figure 4. 76 Elevation of the stair. Çelik 2008.

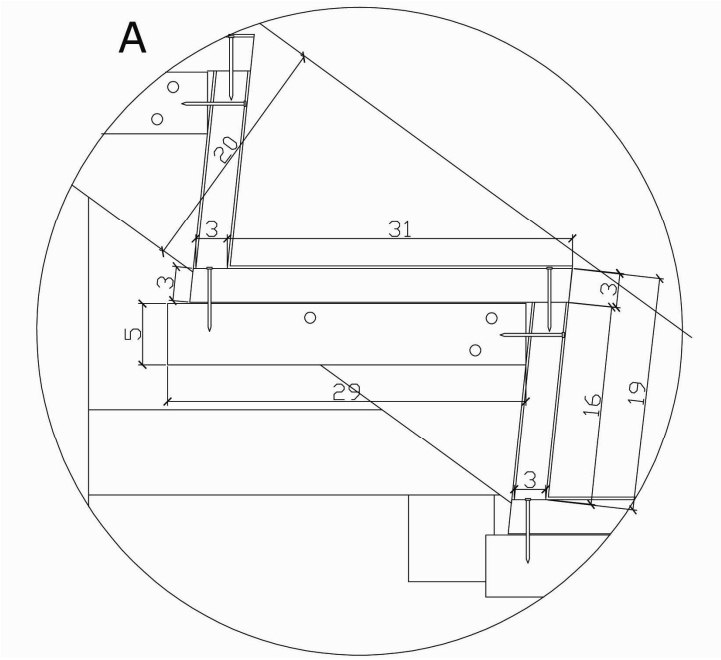

Figure 4. 77 Detail from the stair. Çelik 2008.

Figure 4. 78 Detail from the stair. Çelik 2008.

Figure 4. 79 Detail from the stair. Çelik 2008.

4.3 HAND TOOLS OF THE CARPENTERS

In the construction of traditional Ormana houses, the woodworks are formed very important part as framing the architectural elements and structural elements. In the framing the architectural elements, carpenters were used several tools for shaping the timber elements on benches or on the architectural elements in the buildings. Nine of these tools are mentioned below which were used at the beginning of the 20th century. This carpenter tools collection is belong to Alim Doğan Özcivan and all the information about the tools were gained from Ali Usta (carpenter, 90 years old) and Alim Doğan Özcivan but some of the name of the tools were can not be remembered.

Tool 1

This type of tool is used for cut second step on timber elements, by using two big screws, which are located left side of the tool; the width of the perpendicular step can be calibrated. These tools are used on benches.

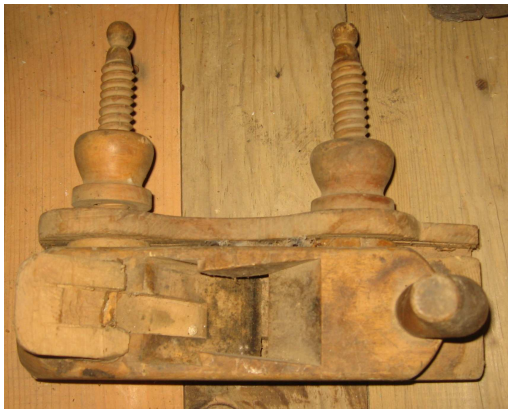

Figure 4. 80 Detail from the tool 1. Çelik, 2008.

Figure 4. 81 Detail from the tool 1. Çelik, 2008.

Figure 4. 82 Detail from the tool 1. Çelik, 2008.

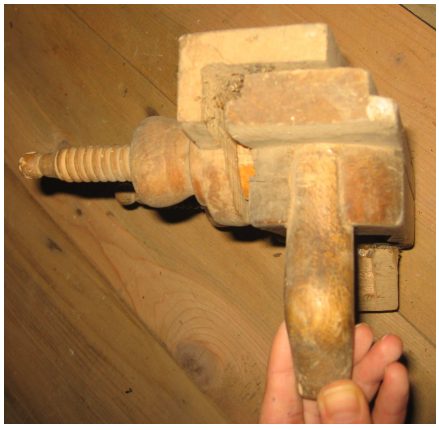

Figure 4. 83 Detail from the tool 1. Çelik, 2008.

Tool 2

A smoothing plane which is called as "**düz taban rende**" is used for shaping on a rough piece of timber to flatten them. These planes are used to impart a smooth surface to a rough piece of timber and reduce thickness of timber. They are formed two parts such as wooden part and sharpened cutter. A cutter which extends below the bottom surface of the plane slices off shavings of timber. The usual length of smoothing plane is about 28 cm. These planes are pushed across several times holding two hands until after the surface is flat and smooth. These tools are used on benches.

Figure 4. 84 Detail from the tool 2. Çelik, 2008.

Figure 4. 85 Detail from the tool 2. Çelik, 2008.

Figure 4. 86 Detail from the tool 2. Çelik, 2008.

Tool 3

A timber tool which is called as "**frengi**" is used for shaping a narrow profile on timber elements as door, windows, cupboard etc. The usual length of frengi is about 20 cm.

Figure 4. 87 Detail from the tool 3. Çelik, 2008.

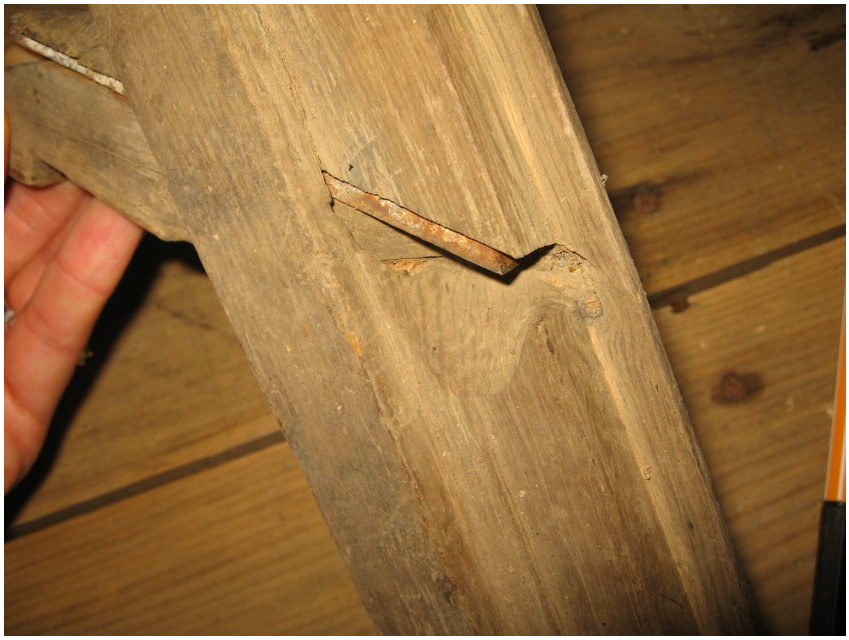

Figure 4. 88 Detail from the tool 3. Çelik, 2008.

Tool 4

This type of plane is a hand tool used for cutting bridle joints in timber elements as panel doors. They are formed three parts such as two timber parts and blade. The timber parts are fixed with two screws and at the middle of the timber body the blade is located, in addition the blade is fixed to the timber body with plane bit

Figure 4. 89 Detail from the tool 4. Çelik, 2008.

Figure 4. 90 Detail from the tool 4. Çelik, 2008.

Figure 4. 91 Detail from the tool 4. Çelik, 2008.

Tool 5

This type of tool which is called as **keniş** is used for open rabbets on timber elements, They are formed four parts such as two timber elements, blade and screws; by using two big screws, the distance of the rabbet to the edge can be calibrated. These tools are used on benches.

Figure 4. 92 Detail from the tool 5. Çelik, 2008.

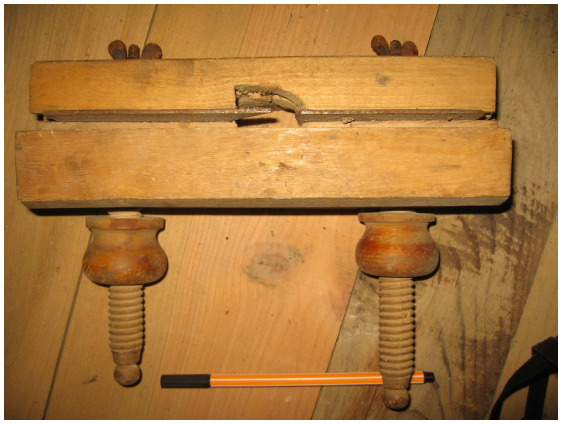

Figure 4. 93 Detail from the tool 5. Çelik, 2008.

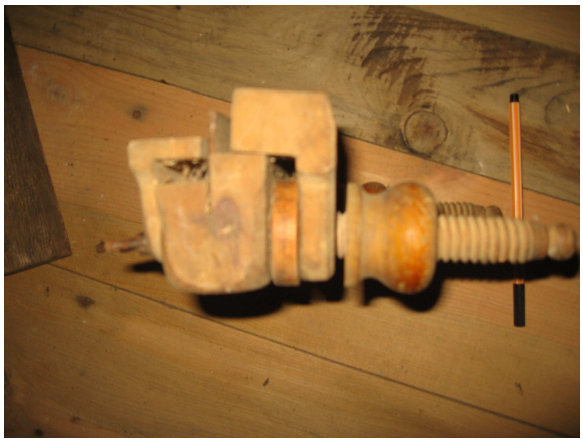

Figure 4. 94 Detail from the tool 5. Çelik, 2008.

Tool 6

A timber tool which is called as "**kordon**" is used for shaping a profile in circular form on timber elements as door, windows, cupboard etc. The usual length of *kordon* is about 20 cm.

Figure 4. 95 Detail from the tool 6. Çelik, 2008.

Figure 4. 96 Detail from the tool 6. Çelik, 2008.

Figure 4. 97 Detail from the tool 6. Çelik, 2008..

Tool 7

This type of plane is called as "**küşteri"** is used for cutting lap joints in timber elements. They are formed two parts such as wooden part and blade. The blade is very slightly wider than the body of the plane; in addition the blade is fixed to the timber body with plane bit. These tools are used on benches.

Figure 4. 98 Detail from the tool 7. Çelik, 2008.

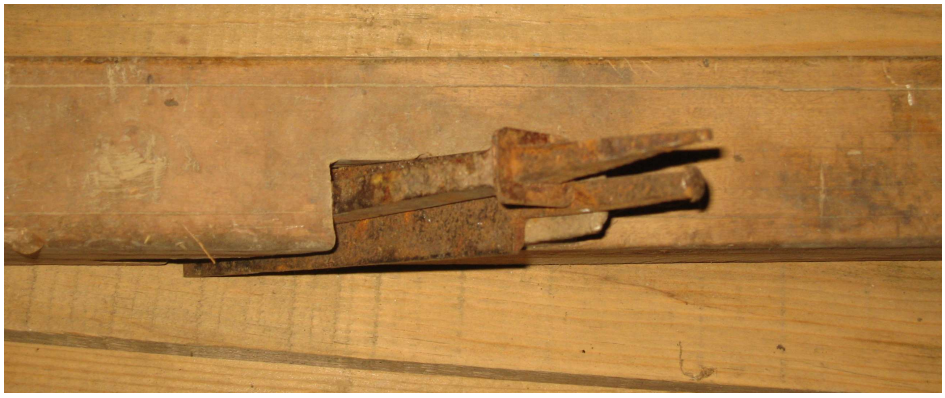

Figure 4. 99 Detail from the tool 7. Çelik, 2008.

Tool 8

A plane is used for shaping on piece of timber to flatten them. They are formed two parts such as timber part which has grip handles to control the tool and sharpened cutter. A cutter which extends below the bottom surface of the plane slices off shavings of timber. The usual length of smoothing plane is about 20 cm. These planes are pushed across several times holding two hands until after the surface is flat and smooth. These tools are used on benches.

Figure 4. 100 Detail from the tool 8. Çelik, 2008.

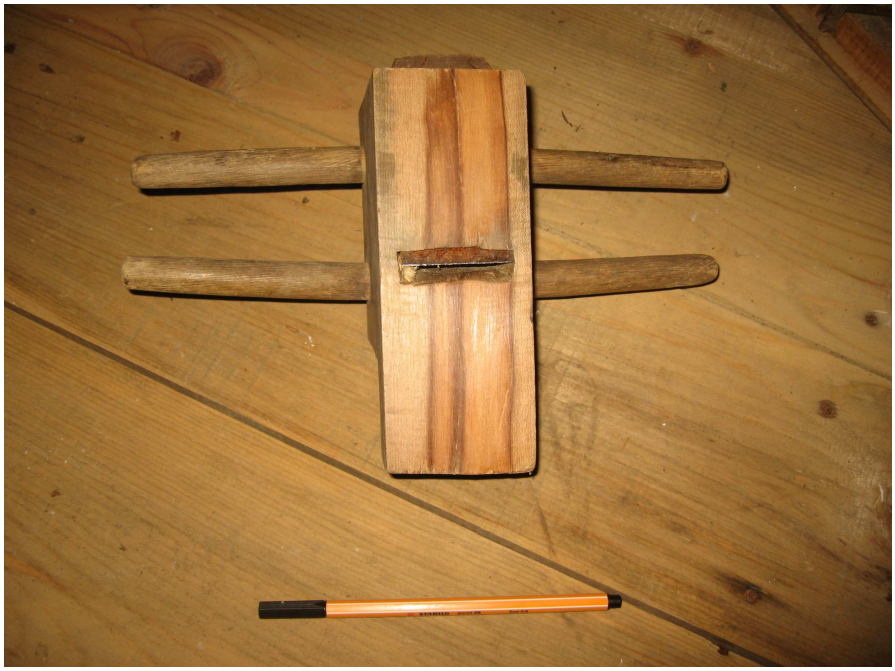

Figure 4. 101 Detail from the tool 8. Çelik, 2008.

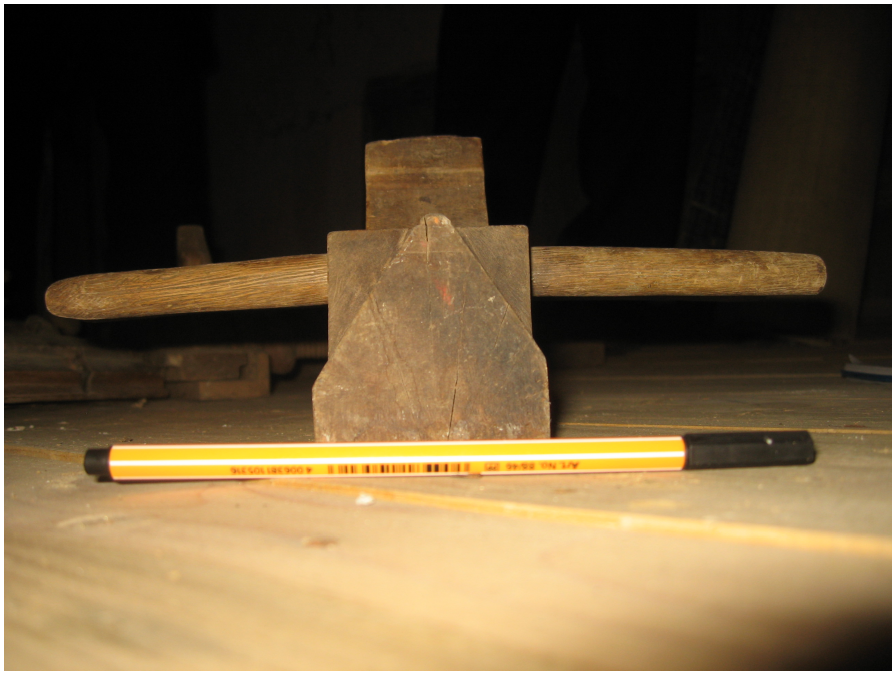

Figure 4. 102 Detail from the tool 8 Çelik, 2008.

Tool 9

A timber bubble level is an instrument indicating whether a surface is level or plumb, and they are used to establish vertical or horizontal reference. The usual length of bubble level is about 60 cm.

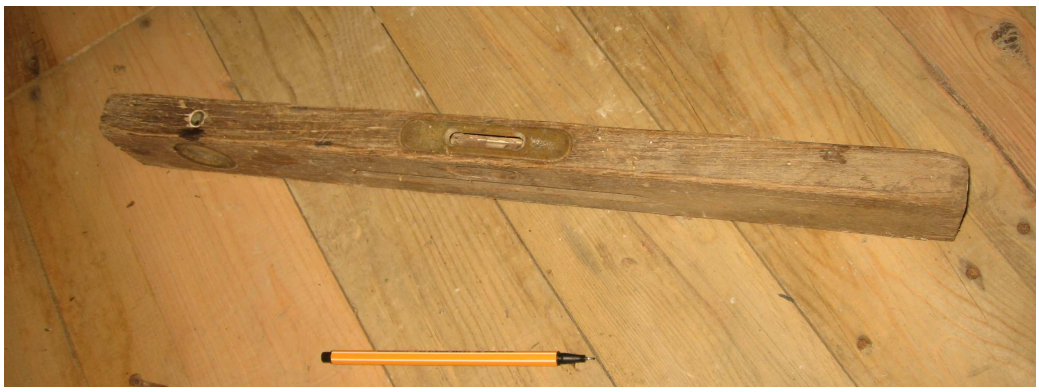

Figure 4. 103 Detail from the tool 9. Çelik, 2008.

CHAPTER 5

EVALUATION and CONCLUSION

Two main construction materials used in traditional Ormana houses therefore are stone and timber chosen according to their structural characteristics and the methods employed in construction. Stone and timber are used as the dominant construction materials due to their availability in the region.

The traditional houses in Ormana are mainly stone masonry reinforced by timbers that are horizontally placed on interior and exterior faces in two directions in masonry walls. Rubble stone can be applied without plaster and without mortar, where the exterior walls are existed while interior walls are plastered. Nonetheless, the upper floor partition walls being different from ground floor in terms not only the material, but also the. Timber frame technique is used in the construction of these walls. In addition timber frame walls are used without plaster except *bagdadi* walls. (See Figure 5.1, 5.2, 5.3)

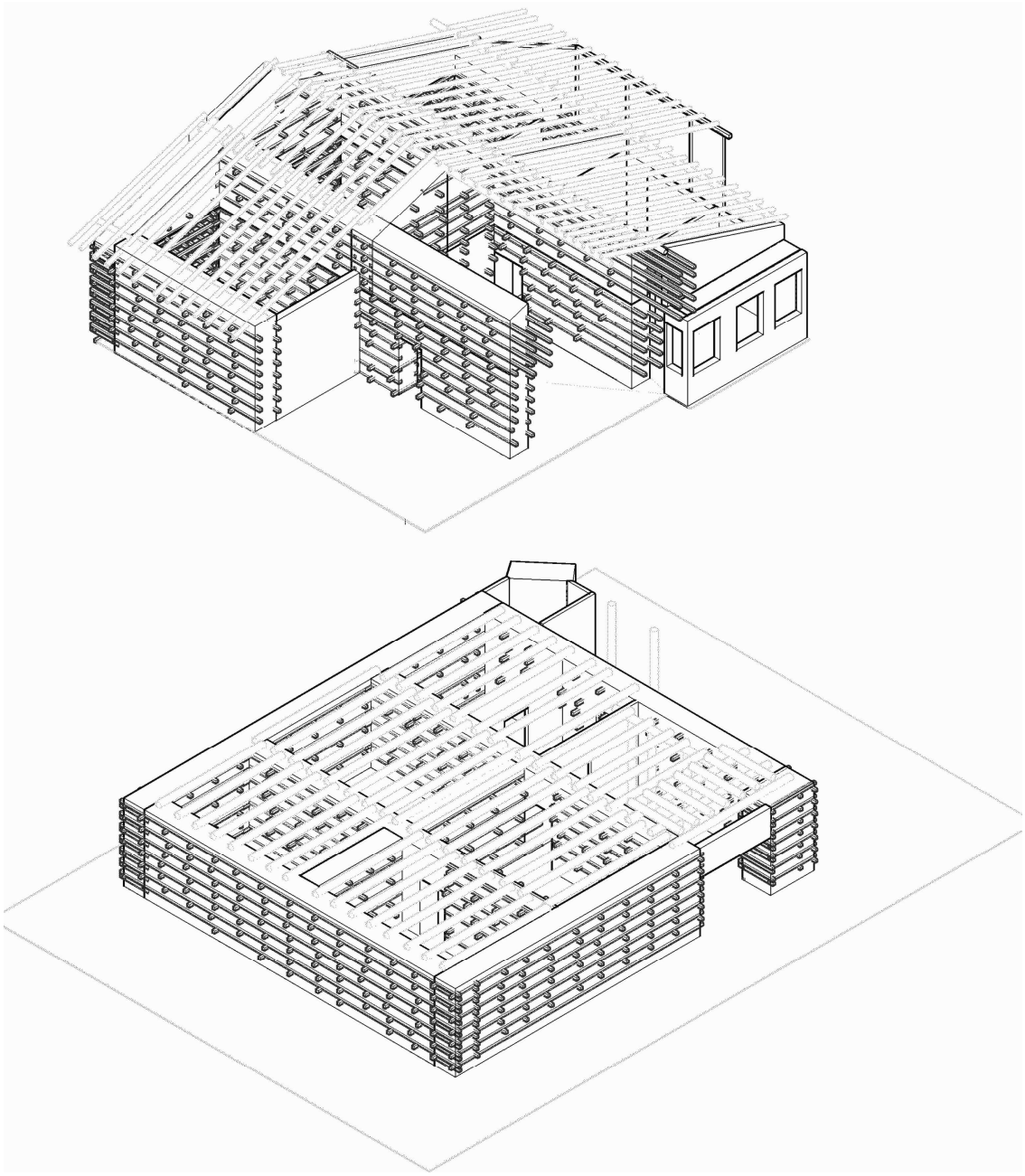

Figure 5. 1 Axonometric view of the Gümüşler House

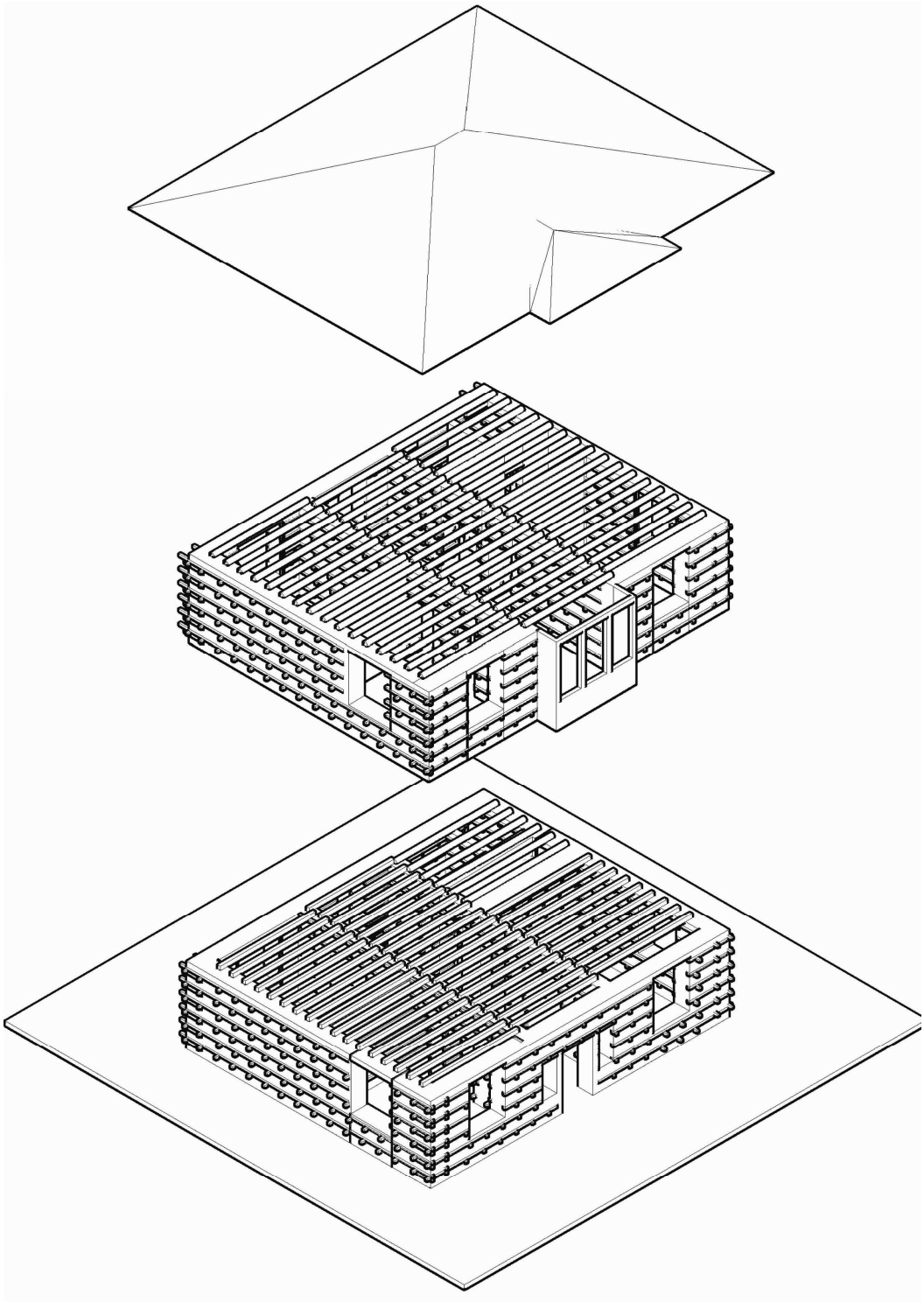

Figure 5. 2Axonometric view of the Gürsoy House

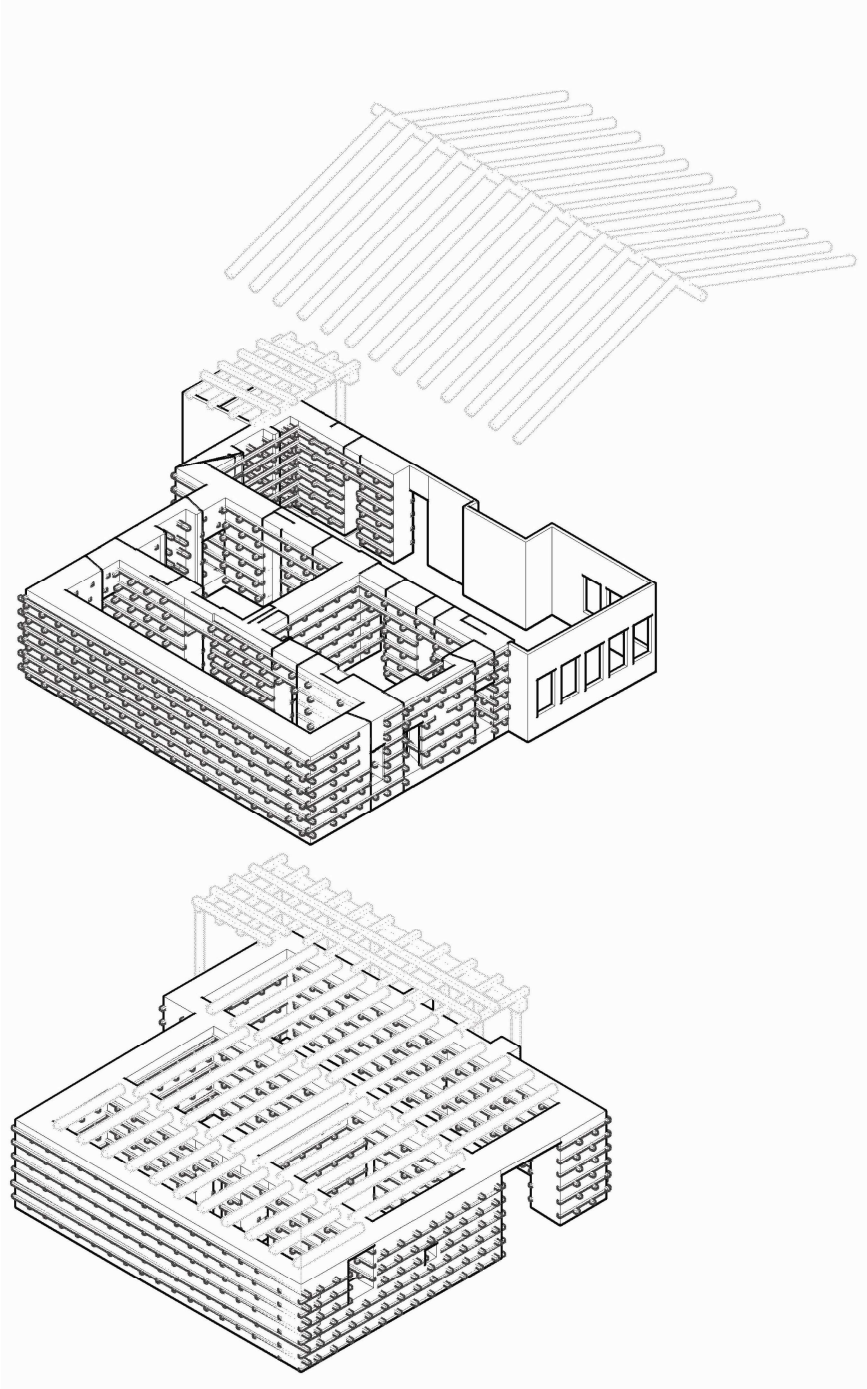

Figure 5. 3 Axonometric view of the Municipality Guest House

Process of Construction

In the building process, firstly the construction materials that will be used in the building are prepared like obtaining and classification timber and stone.

According to the interview of the inhabitants and craftsmen, in Ormana, the area has a comparatively rough and rocky character therefore inhabitants prefer rocky zones to built house for to gain more field of agriculture. Also they used these rocky zones as a foundation of the buildings

The ground floor walls are built up on top of the rock, but if the ground is not homogeneous and the earth is inadequate the foundation pit where the building will be erected was excavated. According to the character of the ground the depth of the foundation pit varies. Afterwards the foundation walls are made by using stone. Foundation walling continues underneath the walls following the external contours of the structure.

Walls are constructed with alternating rows of rubble stone and timber and are constructed with rubble stone without using any mortar which is called as"*düğmeli duvar*". These walls consist of 60-80 cm. thick double skin wall constructions. Timber bond beams are horizontally placed at every 30-35 cm in two directions for the reinforcement of the wall. The timber beams which are used at short dimension of the wall called as *pişt*u*van* and during the building construction these *pişt*u*vans* are used as scaffold

If it is necessary to leave openings in 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. The timber lintels are five or six in number which are placed throughout the thickness of the wall. These lintels with a cross section 7x7 cm. were placed as spanning elements at the top of the opening; undersides of them are covered with timber boards.

To on top of the ground floor walls, the floor girders are placed usually parallel to the shorter side of the space below, in each 40-50 cm. Timber floors are constructed by placing the floor girders that have a circular cross section about r: 15 cm. on the timber sill plates. The floor girders are put in a row that consists of single layers. The timber sill plates, which the floor girders set, are put on the timber bond beams of the walls. In some cases floor girders set on the timber bond beams of the walls directly. Afterwards the girders are inserted 30-40 cm. in to the walls. Later the walls of the upper floor are built on top of the ground floor masonry walls without any joints or plates.

If there is a projection above the ground floor, structural elements of the projections are built together with the floor of the upper storey; the beams of the projection are placed during the construction of the masonry walls.

Afterwards the roof structure is completed. If the roof is gable, roof structure is constructed by setting on the top of walls directly and rafters are placed regularly in each 50cm, these girders are used as ceiling girders of the upper floor at the same time. If the roof is hip roof the roof structure is set on top of the upper storey ceiling girders. The eaves are project 40 cm on the facades and the bottom of the eaves are not covered at the both types of the roofs.

The roofing has "over and under tile" roof tile finishing which are lying parallel to the inclination direction of the roof facades. Nevertheless, the original tiles of the roofs were altered with "french tile" type of tiles in the some parts of the houses.

All the connections are fixed by nails and not by the joints.
After the masonry walls, main structure of timber framed skeleton parts and the roof structure are finished, the window and the door posts are completed in timber framed section as *ayazlık, şahnişin* and partition walls which are *bağdadi* walls according to the spans on the walls.

Afterwards, the floor pavements are completed. The top of the floor girders was covered with the timber flooring boards (2x20cm) perpendicular to them. A timber plinth surrounded the edges of the space, where the flooring and the wall met.
The ceilings of the spaces are covered and decorated after the floor pavement construction.

Then the partition walls are located in the interior are built by placing the posts around the doors and near the main walls of the spaces where they divide. Posts, which are located at the near the main walls, are nailed to the pişţuvans of the masonry walls. One side of these timber frames is covered with 2 x 25 cm. boards by nailing the posts, studs and lintels

If there is a built in sitting platform (seki) in the space the short posts that carry the platform are set on the floor connected to each other with nails.

The built in furniture of the spaces are set in their locations like windows, doors, niches, cupboards, sergen and yaşmak of the fire places. Lastly the plastering and the painting works are done to complete the building.

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APPENDIX A

DRAWINGS RELATED TO THE TRADITIONAL ORMANA HOUSE EXAMPLES

Figure 2 Facade of the traditional Ormana house

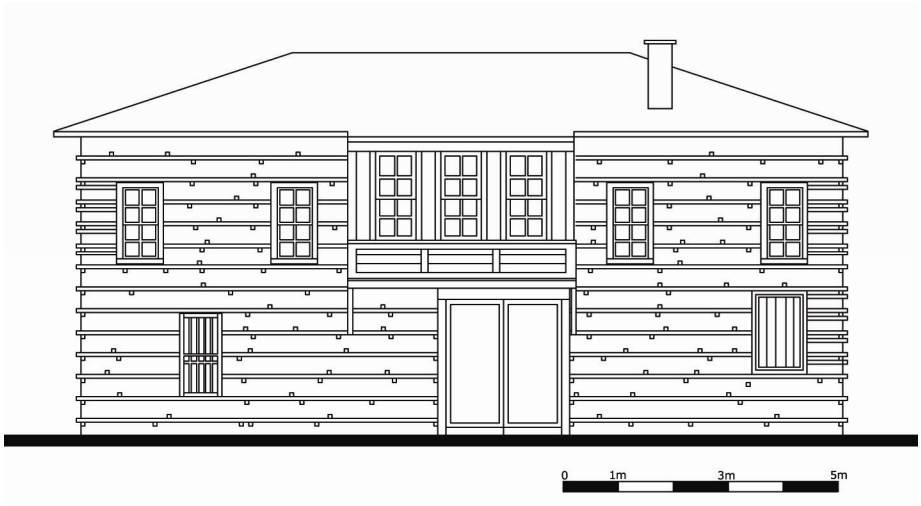


Figure 3 Facade of the traditional Ormana house

Figure 4 Facade of the traditional Ormana house

Figure 5 Facade of the traditional Ormana house

Figure 6 Facade of the traditional Ormana house

Figure 7 Facade of the traditional Ormana house

Figure 8 Facade of the traditional Ormana house

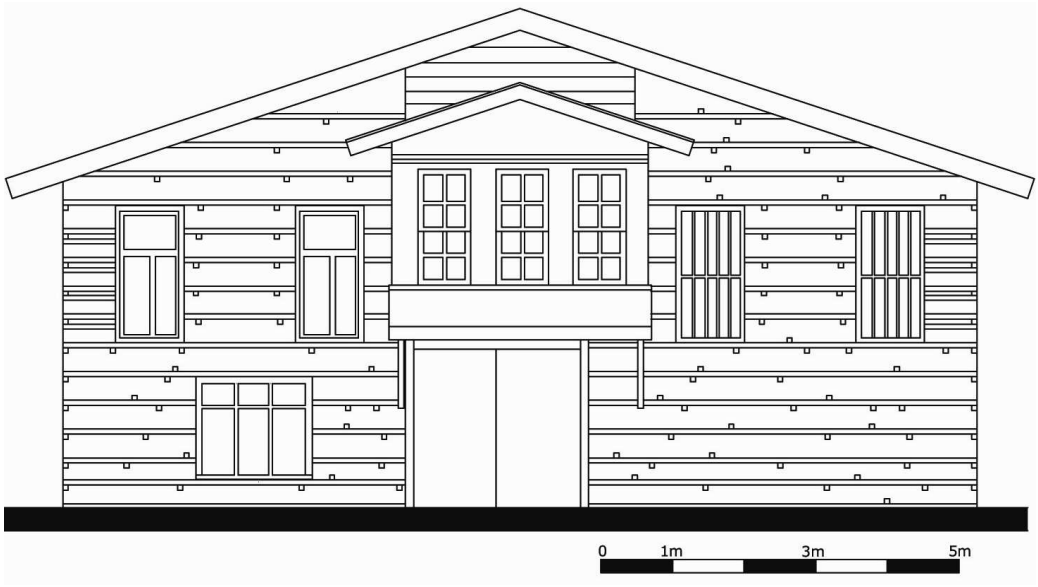


Figure 9 Facade of the traditional Ormana house

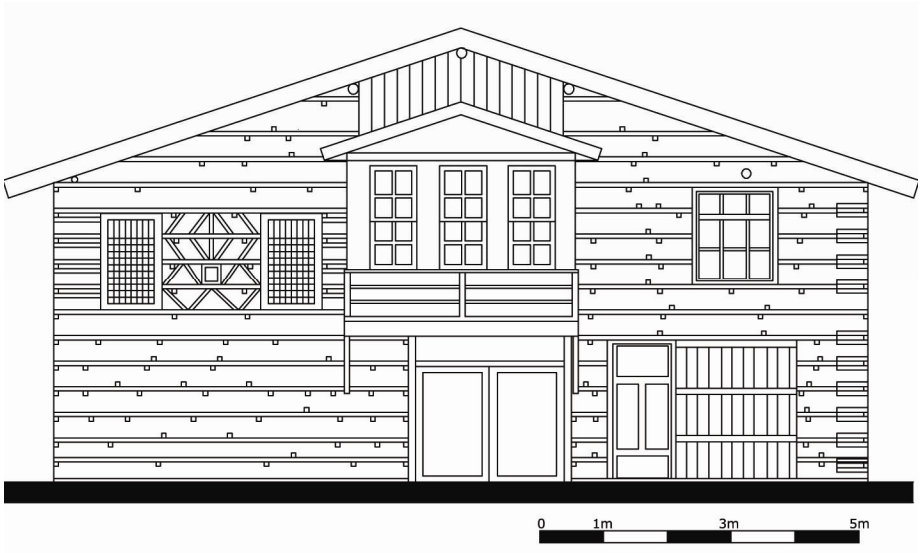


Figure 10 Facade of the traditional Ormana house

Figure 11 Facade of the traditional Ormana house

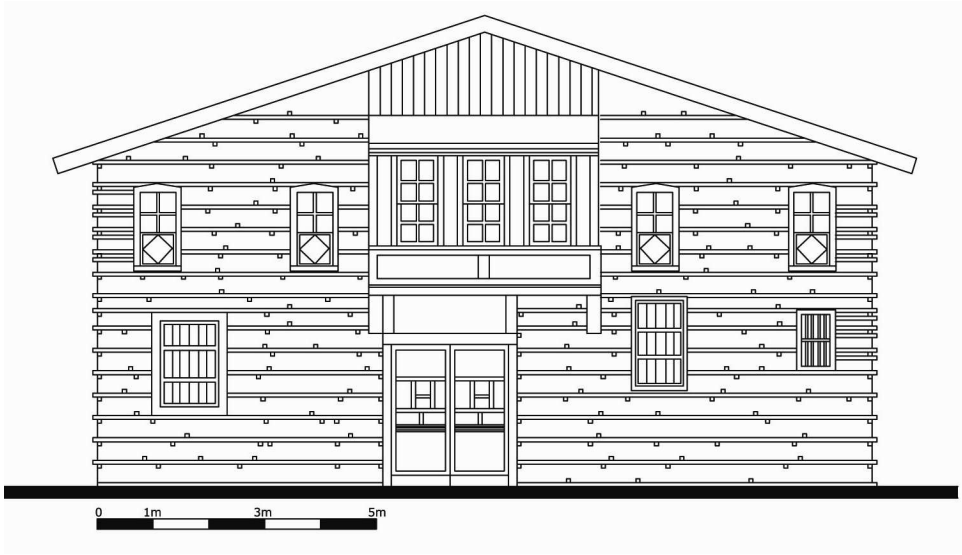


Figure 12 Facade of the traditional Ormana house

Figure 13 Facade of the traditional Ormana house

Figure 14 Facade of the traditional Ormana house

APPENDIX B

DRAWINGS AND FIGURES RELATED TO THE GÜMÜŞLER HOUSE

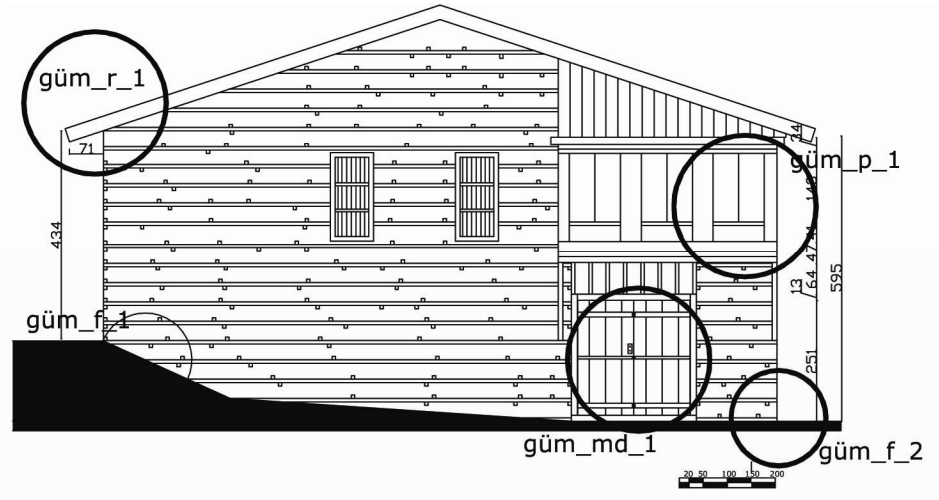


Figure 15 The drawing of the south-west façade of Gümüşler House. Çelik, 2008.

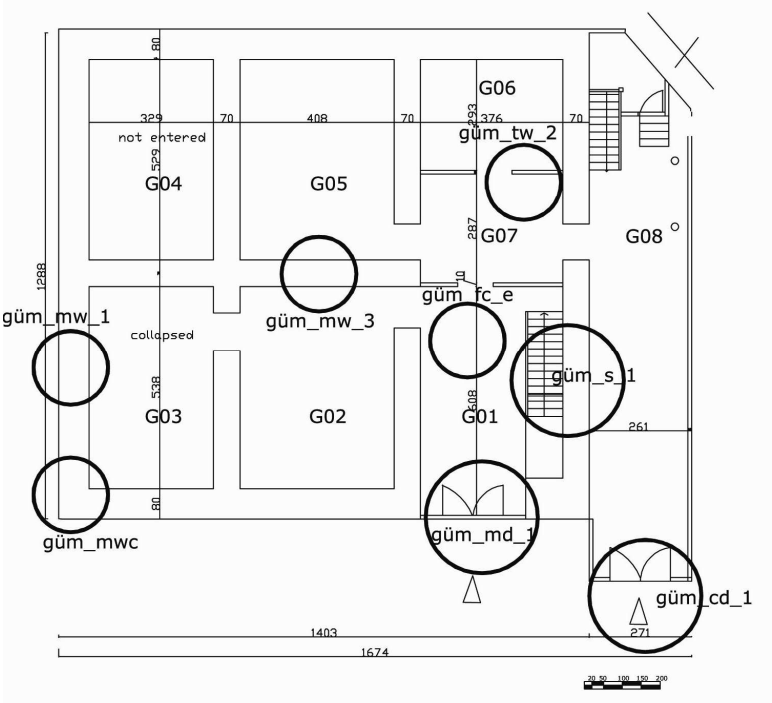


Figure 16 Drawing The plan of the ground floor of Gümüşler House. Çelik, 2008.

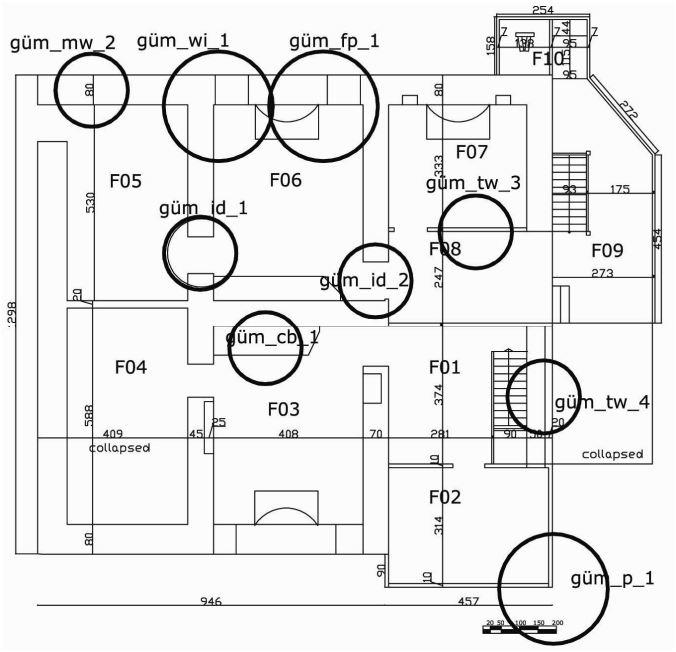


Figure 17 Drawing The plan of the first floor of Gümüşler House. Çelik, 2008.

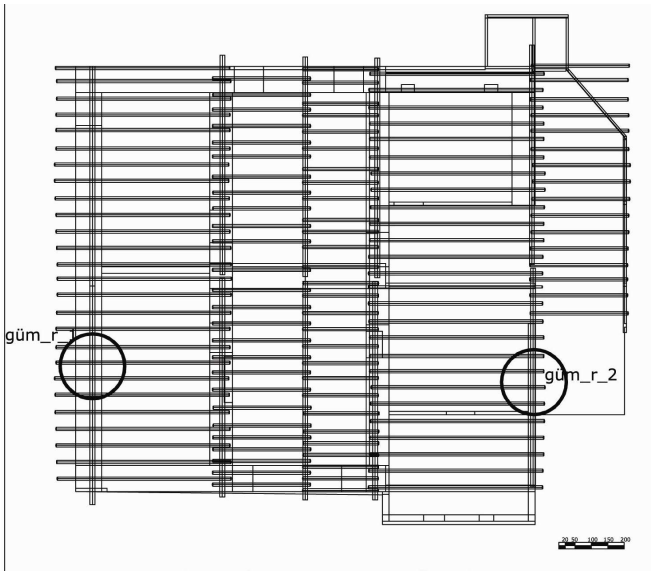


Figure 18 Drawing The plan of the roof of Gümüşler House. Çelik, 2008.

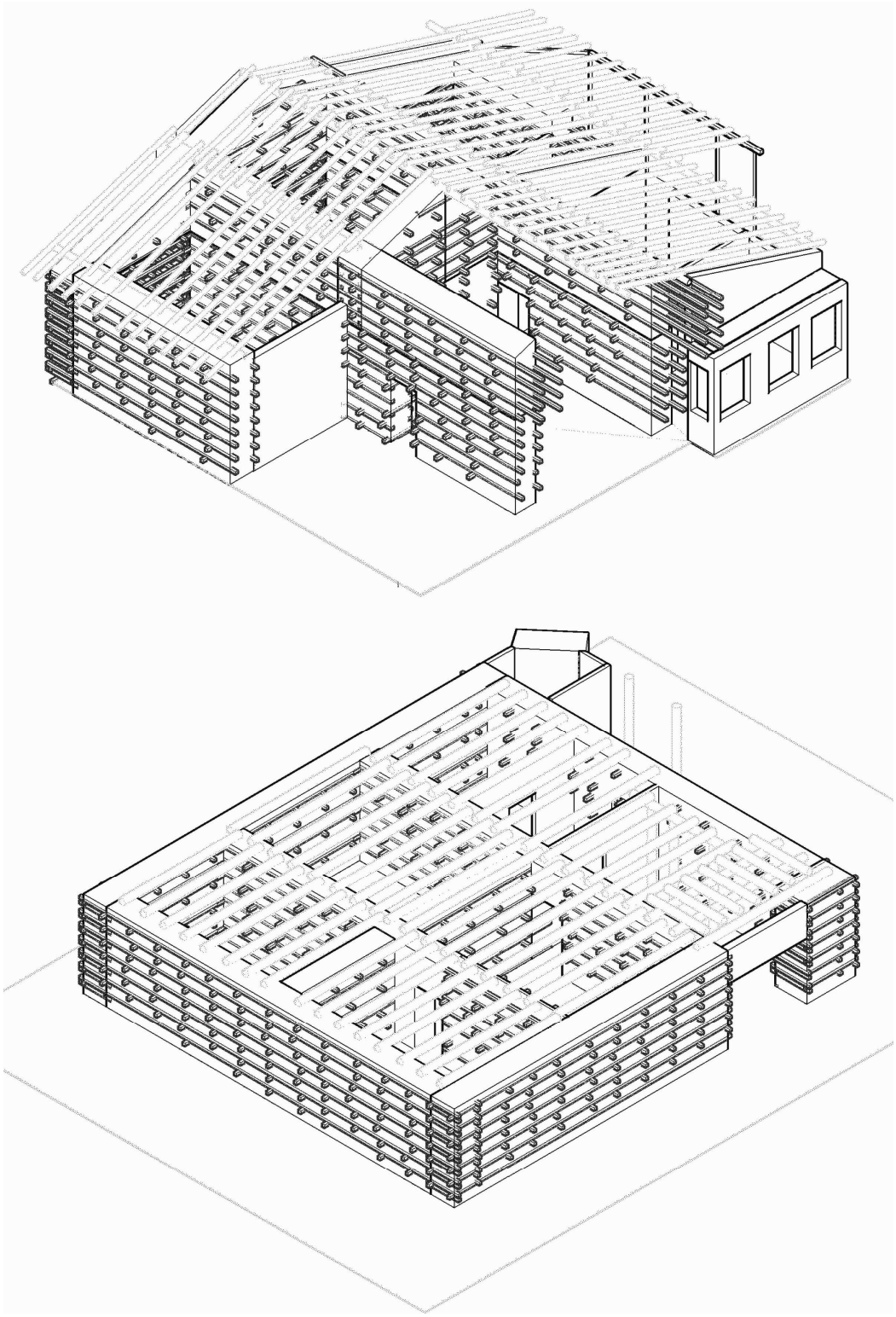


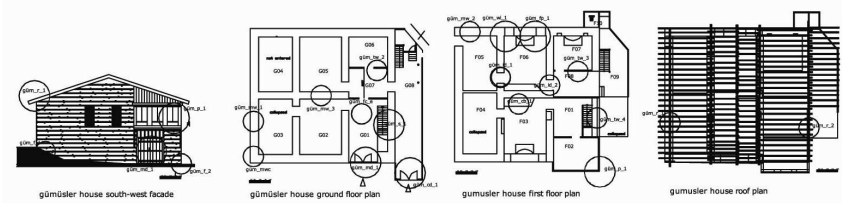
Figure 19 Axonometric drawing of the Gümüşler House. Çelik, 2008.

Figure 20 View from Gümüşler House. Çelik, 2008

Figure 21 View from Gümüşler House. Çelik, 2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_f_1

DETAIL OF THE FOUNDATION



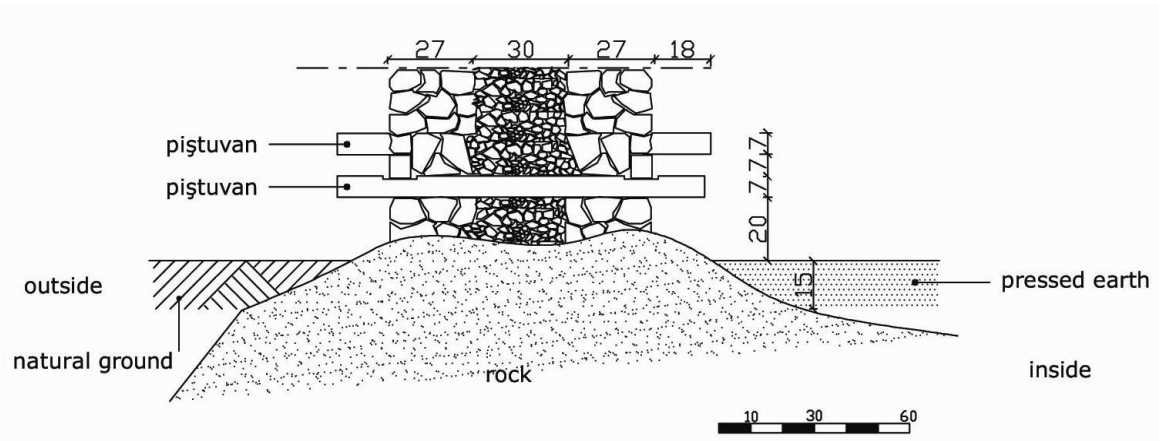


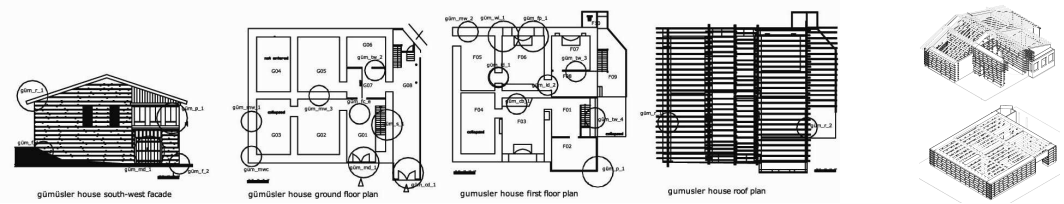
Figure 22 Record card of the detail of the foundation of the Gümüşler House. Çelik, 2008.

Figure 23 Detail from foundation. Çelik, 2008.

Figure 24 Detail from foundation. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_f_2

DETAIL OF THE FOUNDATION



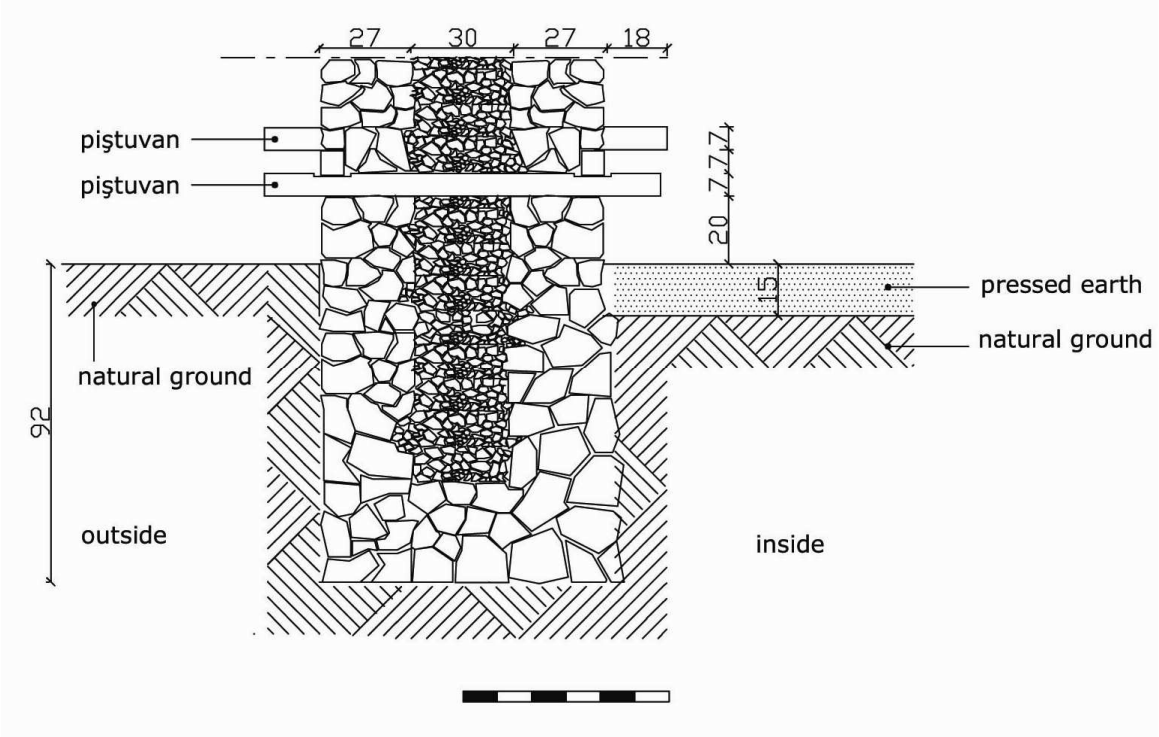
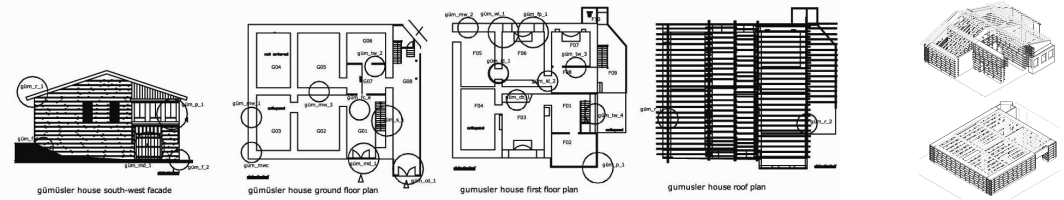


Figure 25 Record card of the detail of the foundation of the Gümüşler House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_mw_1

DETAIL OF THE WALL



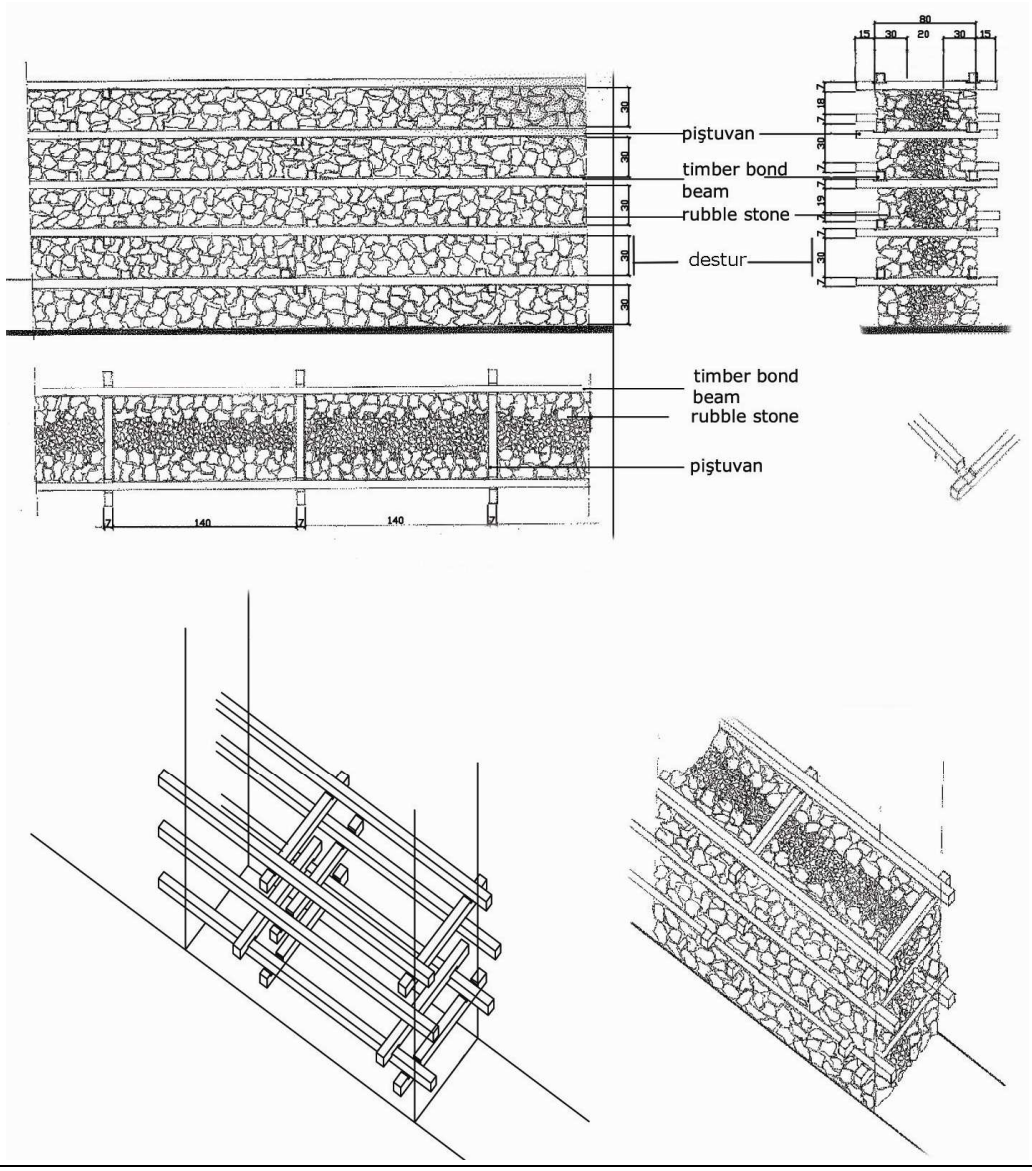


Figure 26 Record card of the detail of the wall of the Gümüşler House. Çelik, 2008.

Figure 27 View from a wall. Çelik,2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
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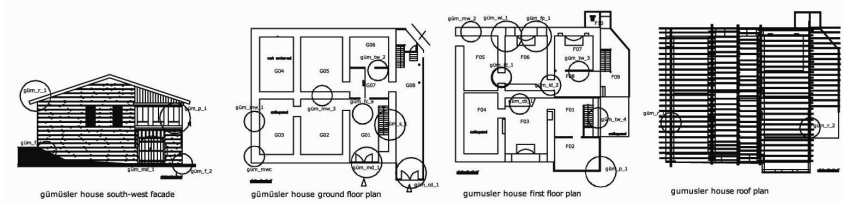
DETAIL OF THE WALL



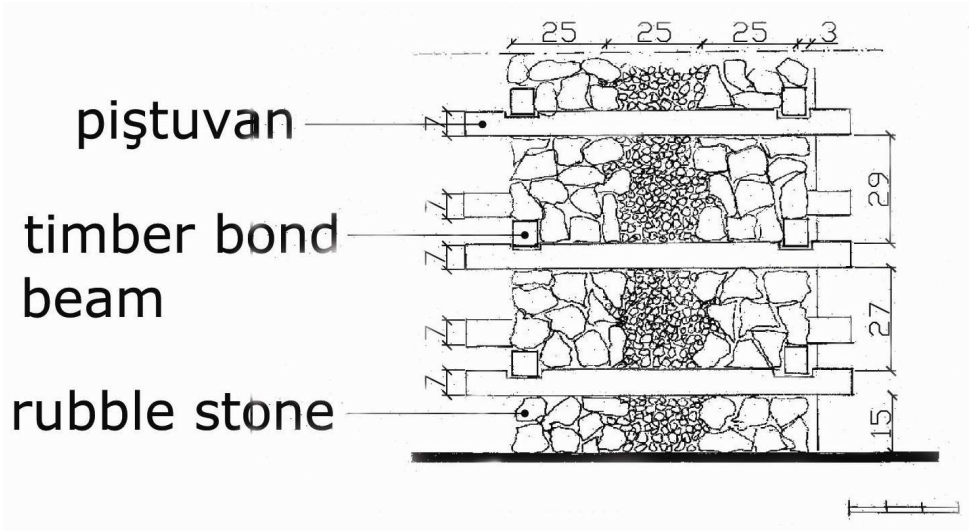


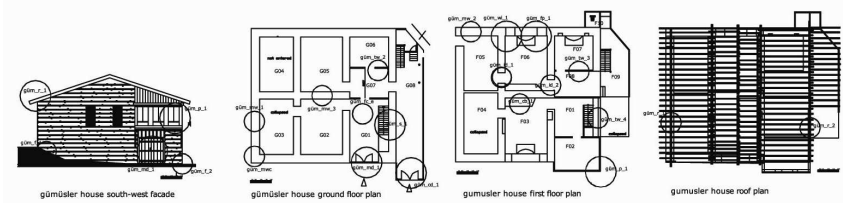
Figure 28 Record card of the detail of the wall of the Gümüşler House. Çelik, 2008.

Figure 29 View from a wall. Çelik,2008

Figure 30 View from a wall. Çelik,2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_mw_3

DETAIL OF THE WALL



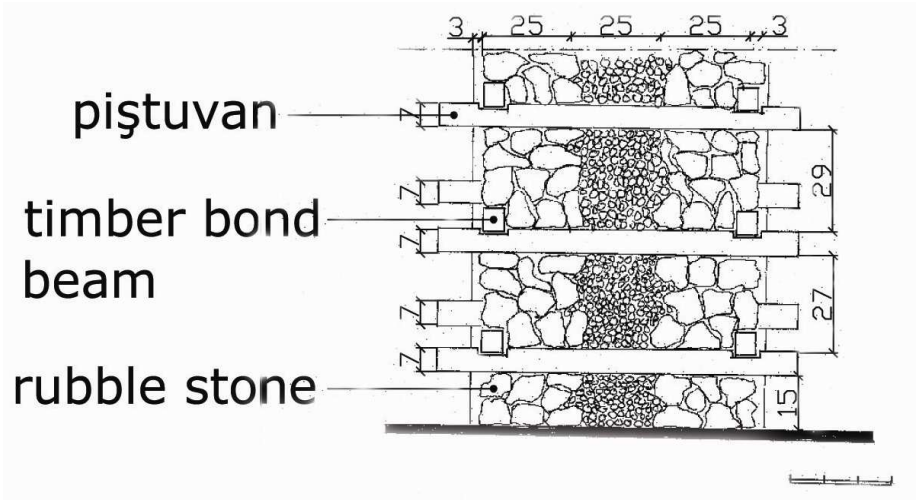
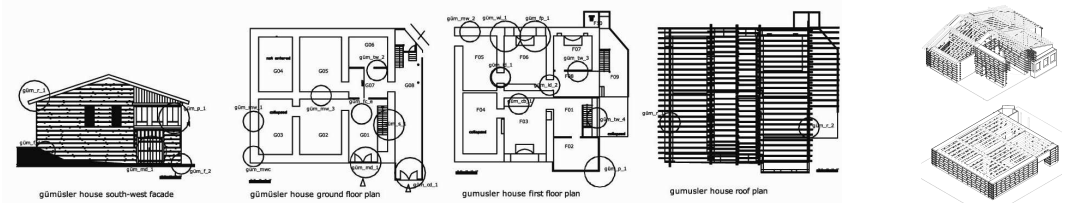


Figure 31 Record card of the detail of the wall of the Gümüşler House. Çelik, 2008.

Figure 32 View from a wall. Çelik,2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_cm

DETAIL OF THE CONNECTION OF THE WALL CORNER



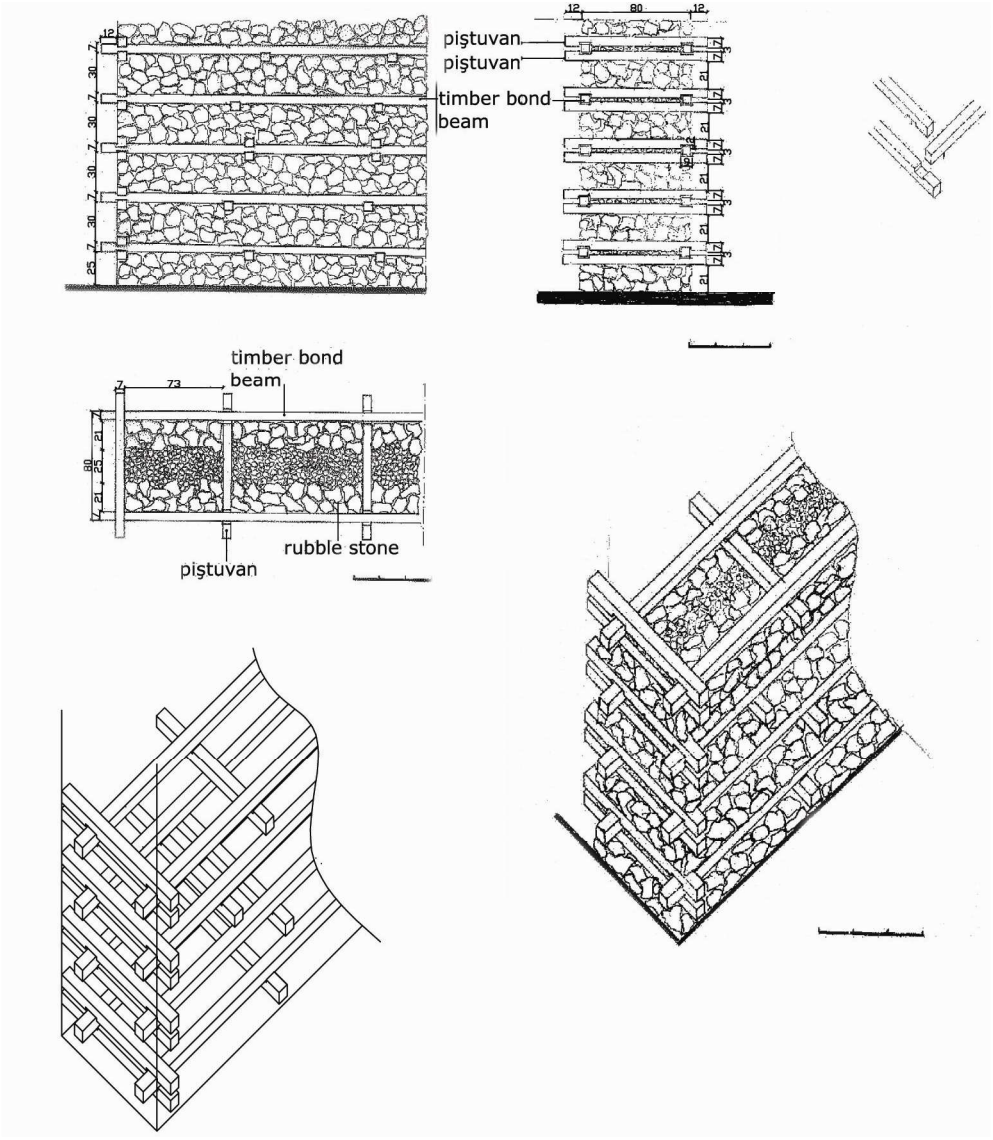
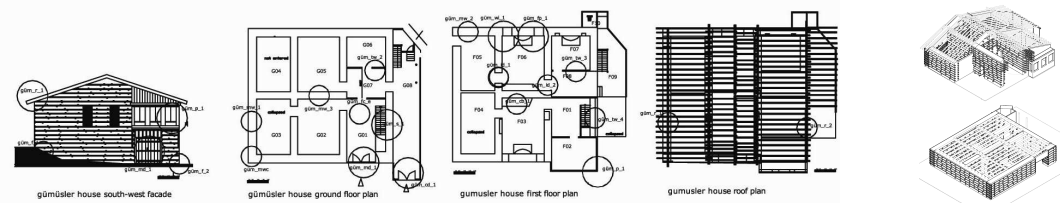


Figure 33 Record card of the detail of the connection of the wall of the Gümüşler House. Çelik, 2008.

Figure 34 View from connection of the wall. Çelik,2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_tw_1

DETAIL OF THE TIMBER WALL



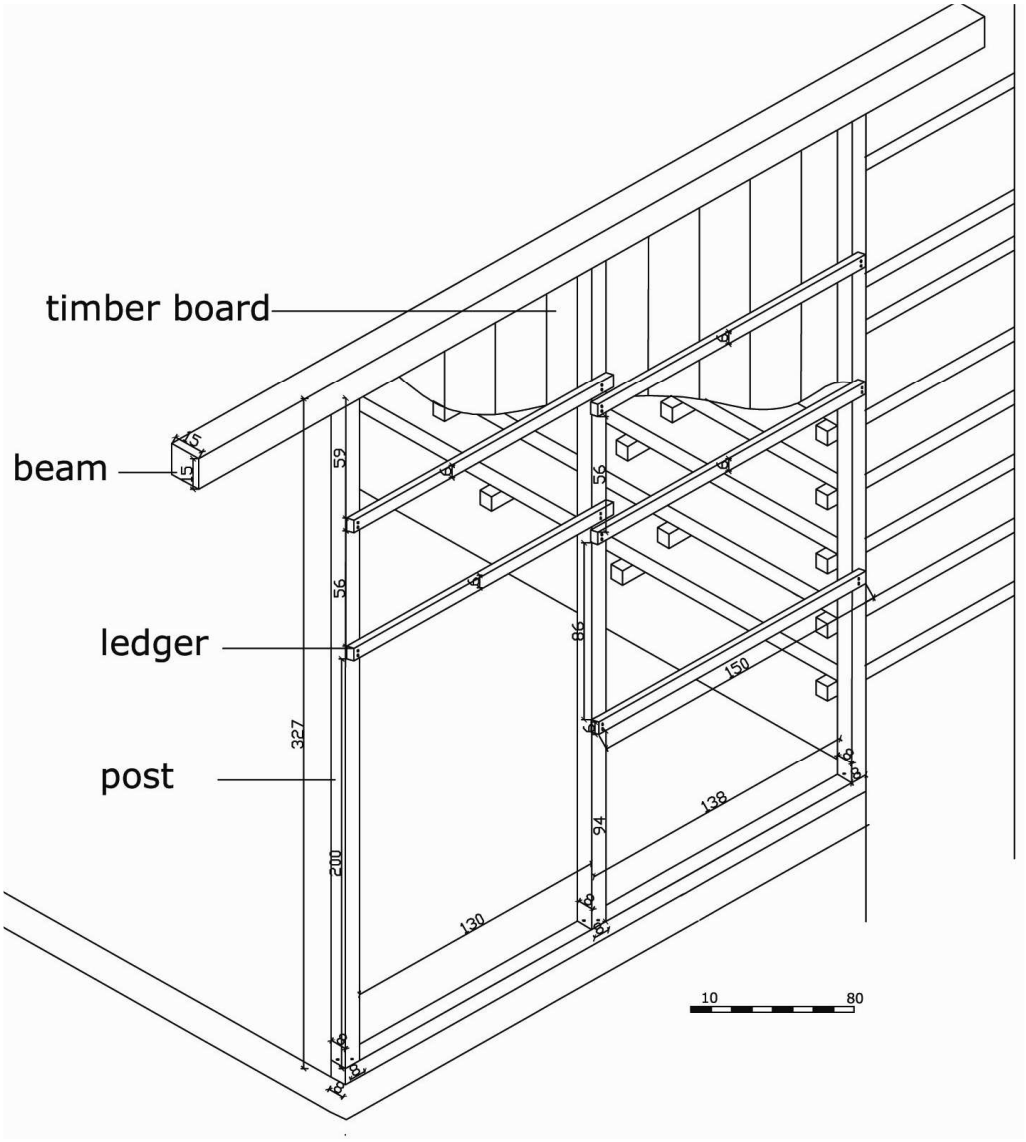
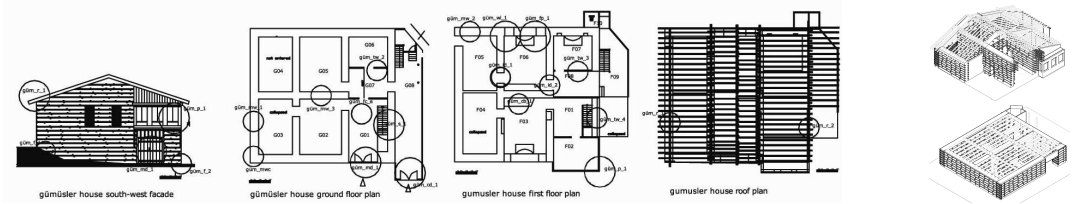


Figure 35 Record card of the detail of the timber wall of the Gümüşler House. Çelik, 2008.

Figure 36 View from timber wall. Çelik,2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_tw_2

DETAIL OF TİMBER WALL



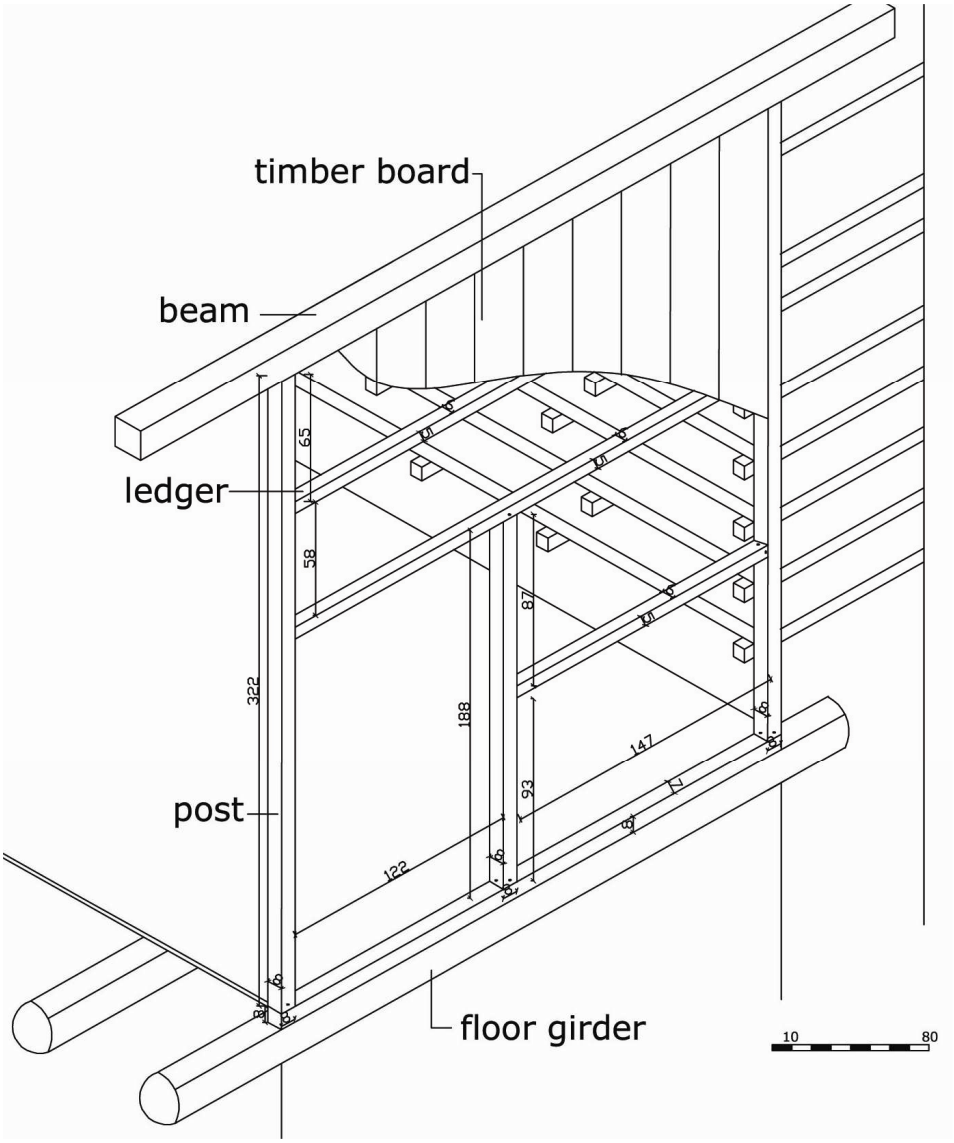


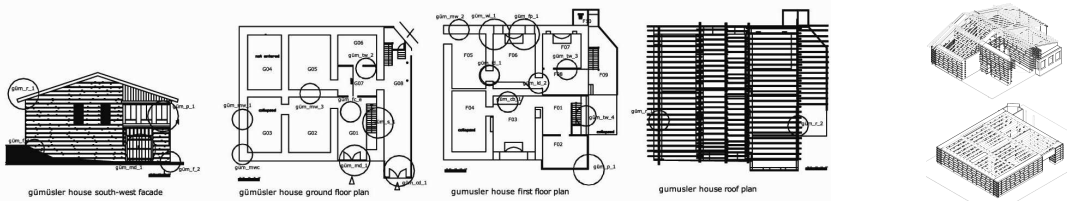
Figure 37 Record card of the detail of the timber wall of the Gümüşler House. Çelik, 2008.

Figure 38 View from timber wall. Çelik,2008

Figure 39 View from timber wall. Çelik,2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_tw_3

DETAIL OF THE TİMBER WALL



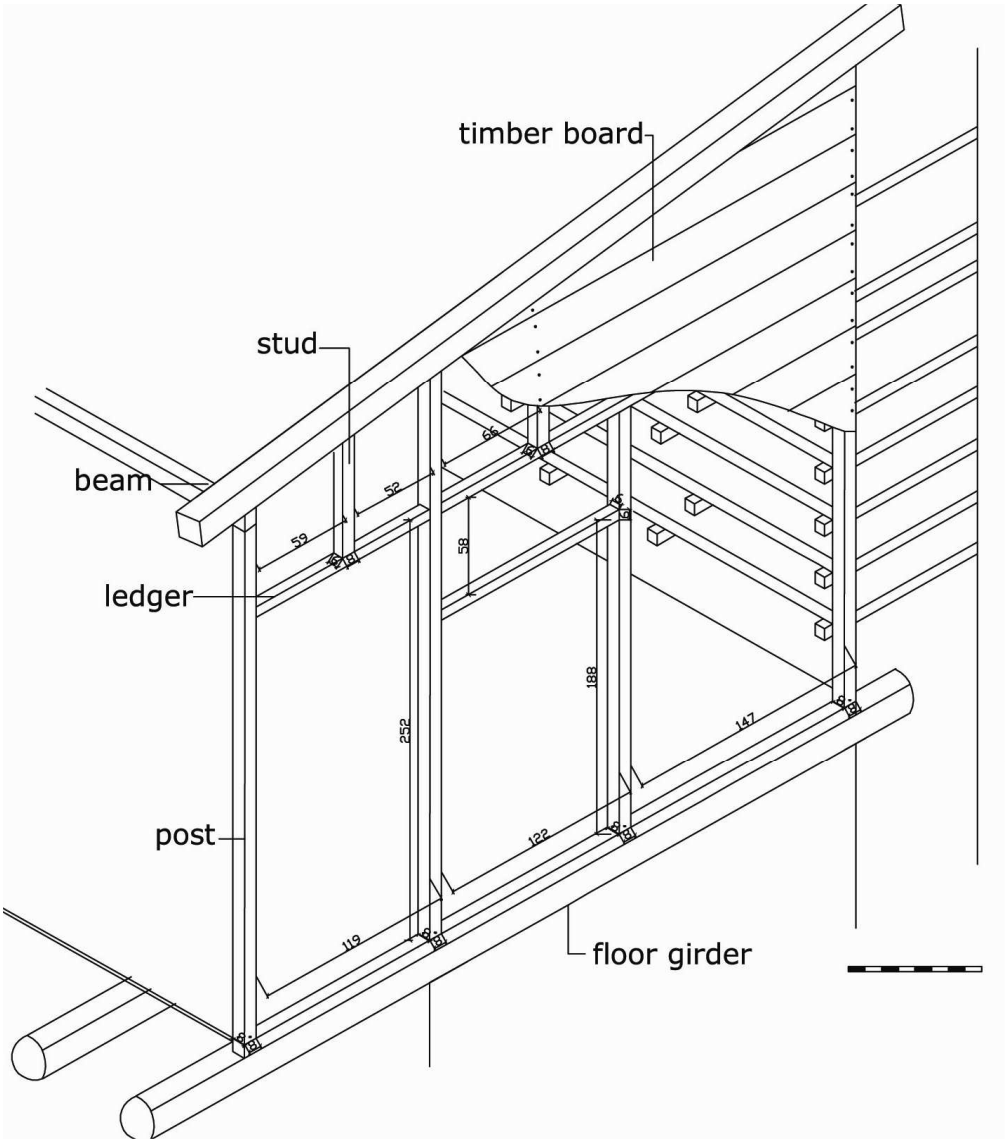
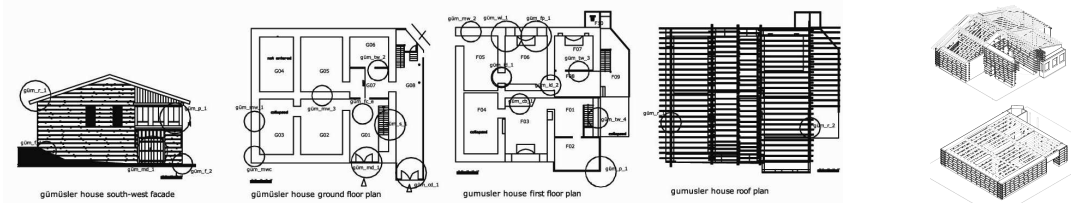


Figure 40 Record card of the detail of the timber wall of the Gümüşler House. Çelik, 2008.

Figure 41 View from timber wall. Çelik,2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_tw_4

DETAIL OF THE TİMBER WALL



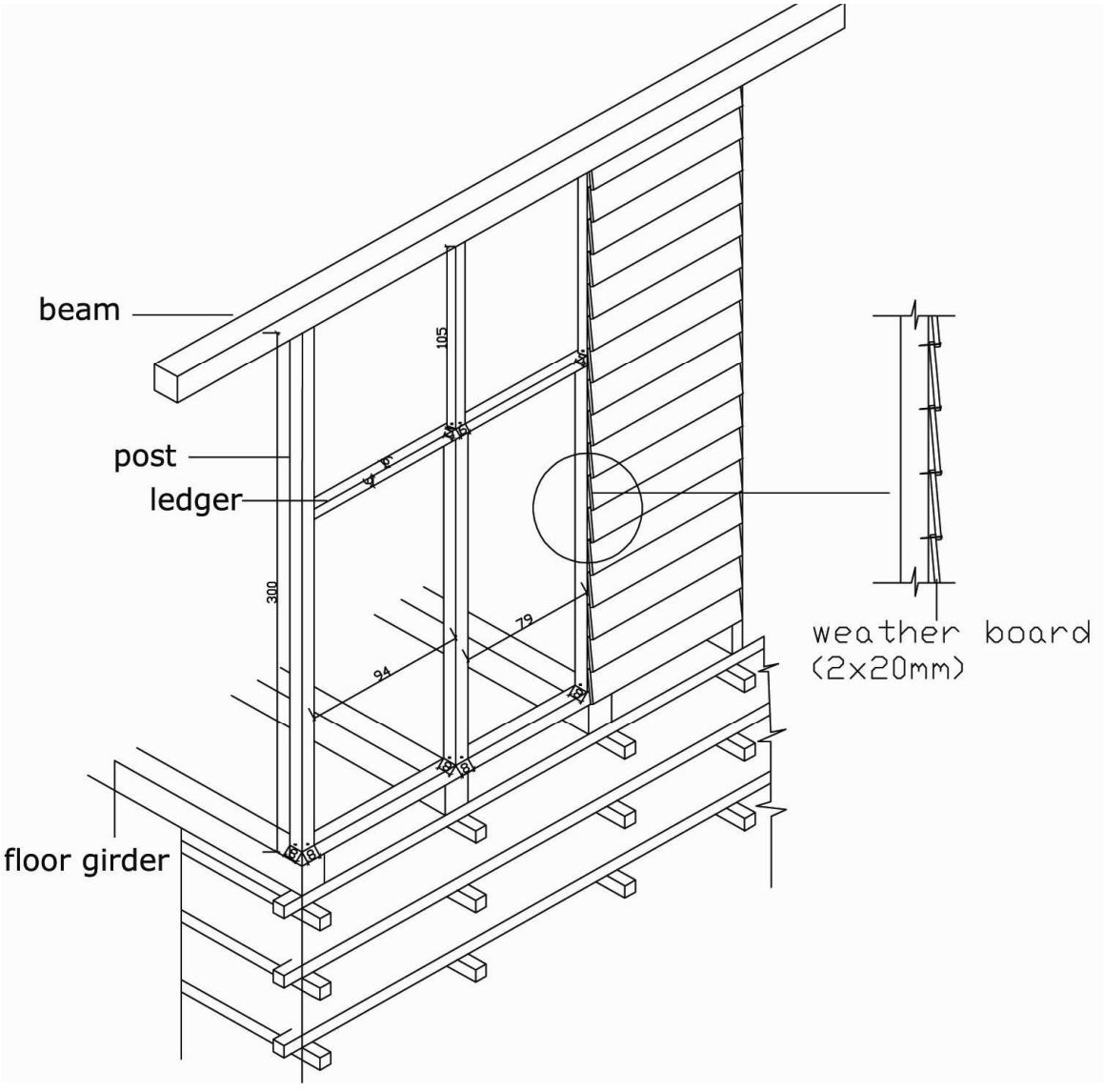


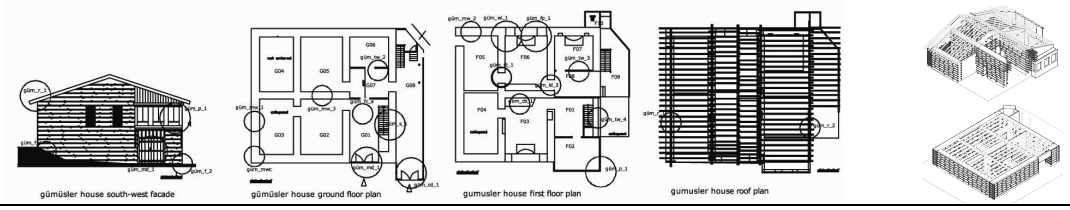
Figure 42 Record card of the detail of the timber wall of the Gümüşler House. Çelik, 2008.

Figure 43 View from timber wall. Çelik,2008

Figure 44 View from earth floor of the Gümüşler House. Çelik,2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_fc_e

DETAIL OF THE FLOOR



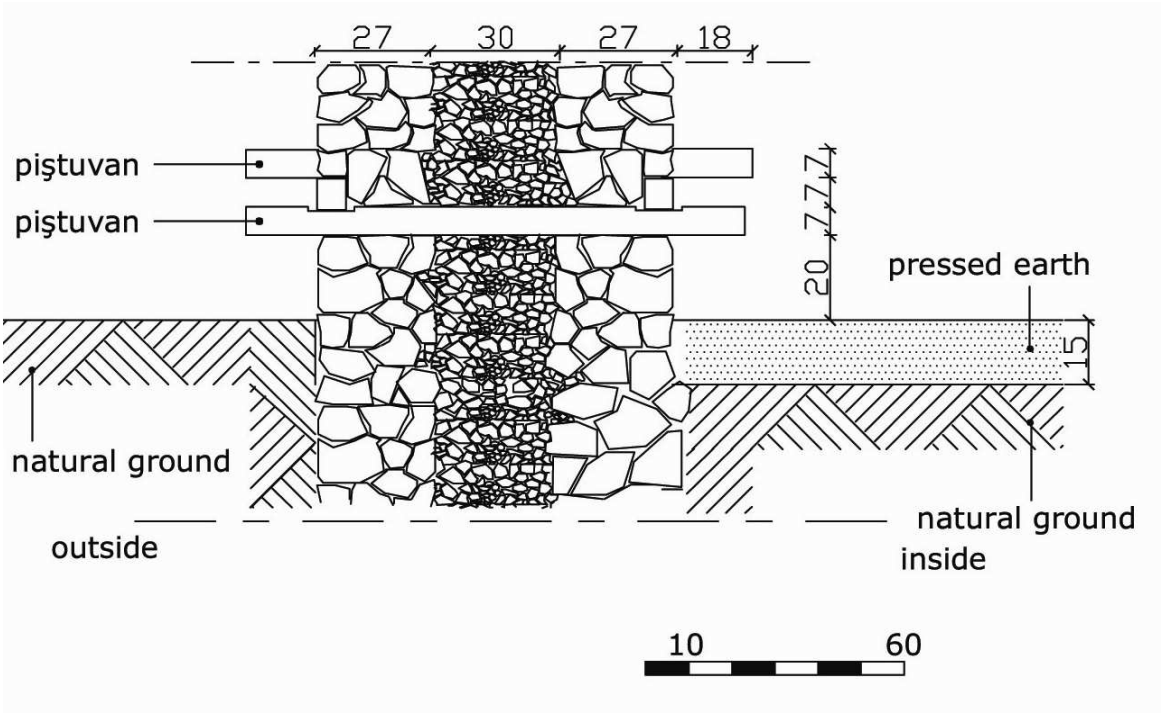
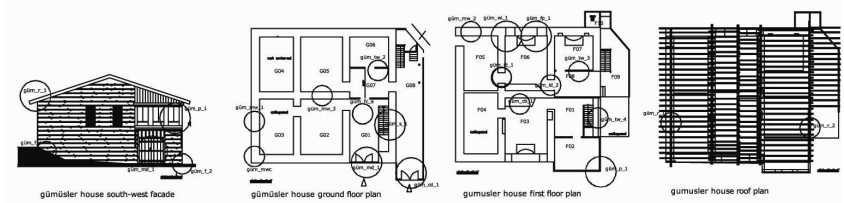


Figure 45 Record card of the detail of the earth floor of the Gümüşler House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_fc_1

DETAIL OF THE FLOOR



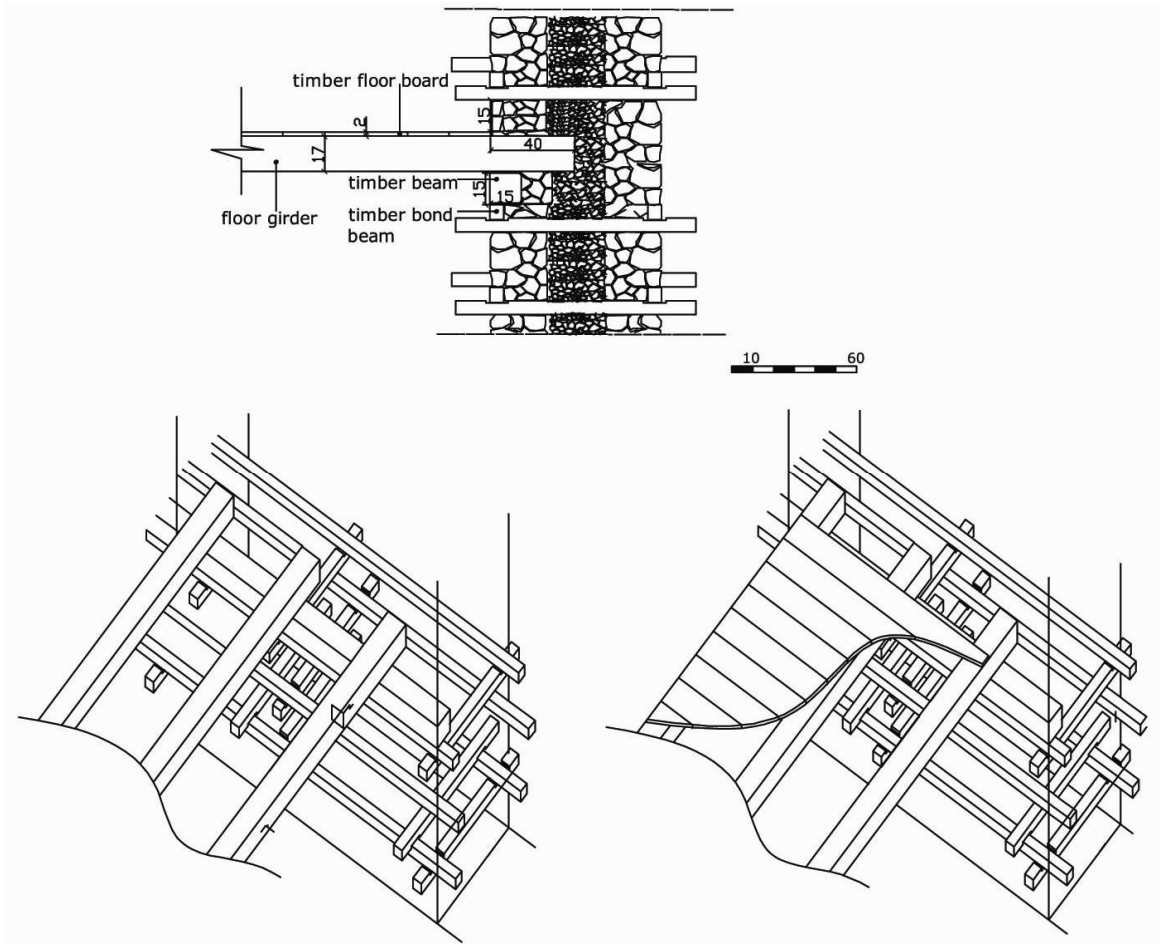
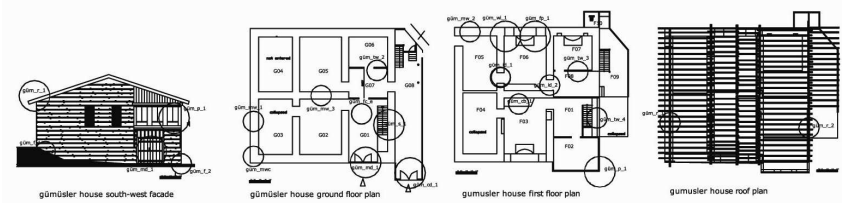


Figure 46 Record card of the detail of the wall of the Gümüşler House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_fc_2

DETAIL OF THE CEILING



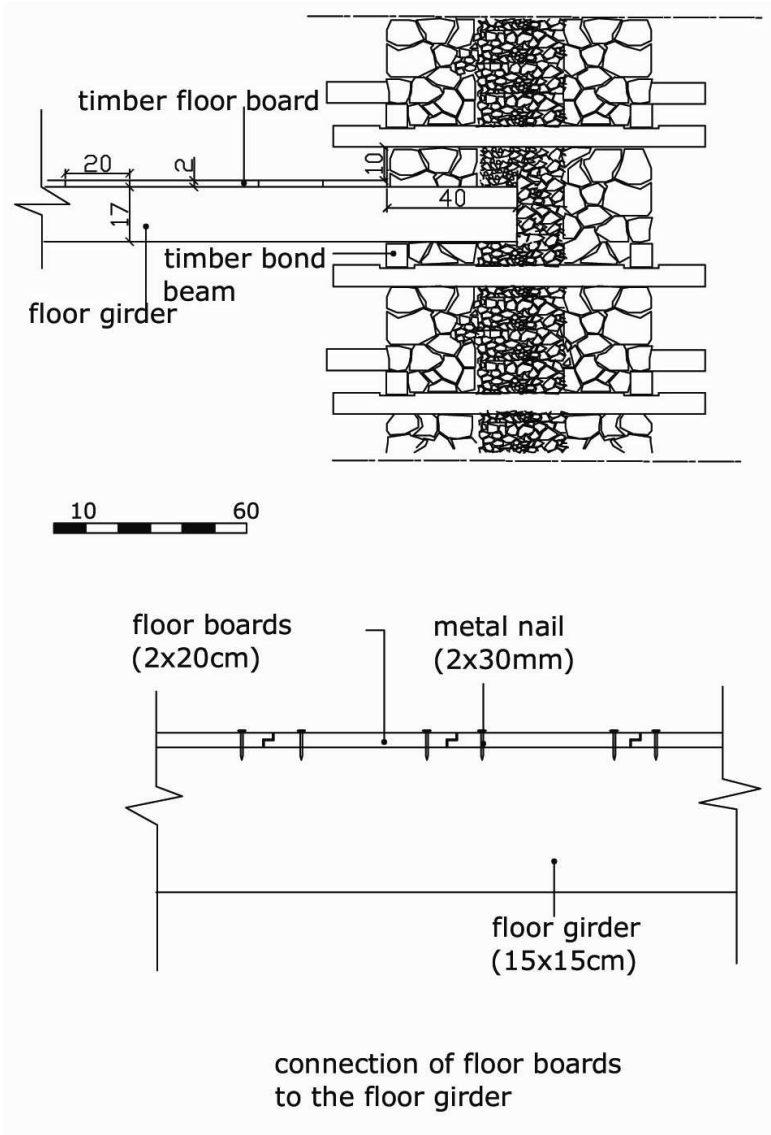
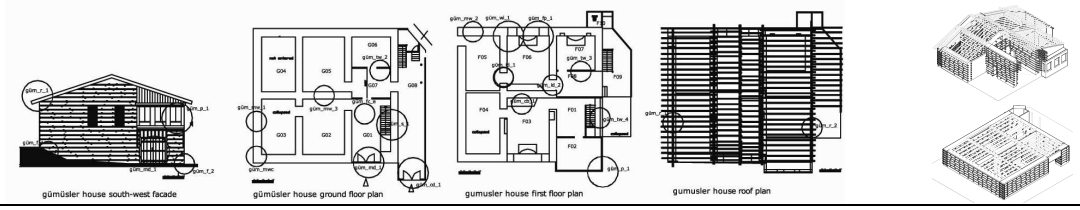


Figure 47 Record card of the detail of the ceiling of the Gümüşler House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_p_1

DETAIL OF THE PROJECTION



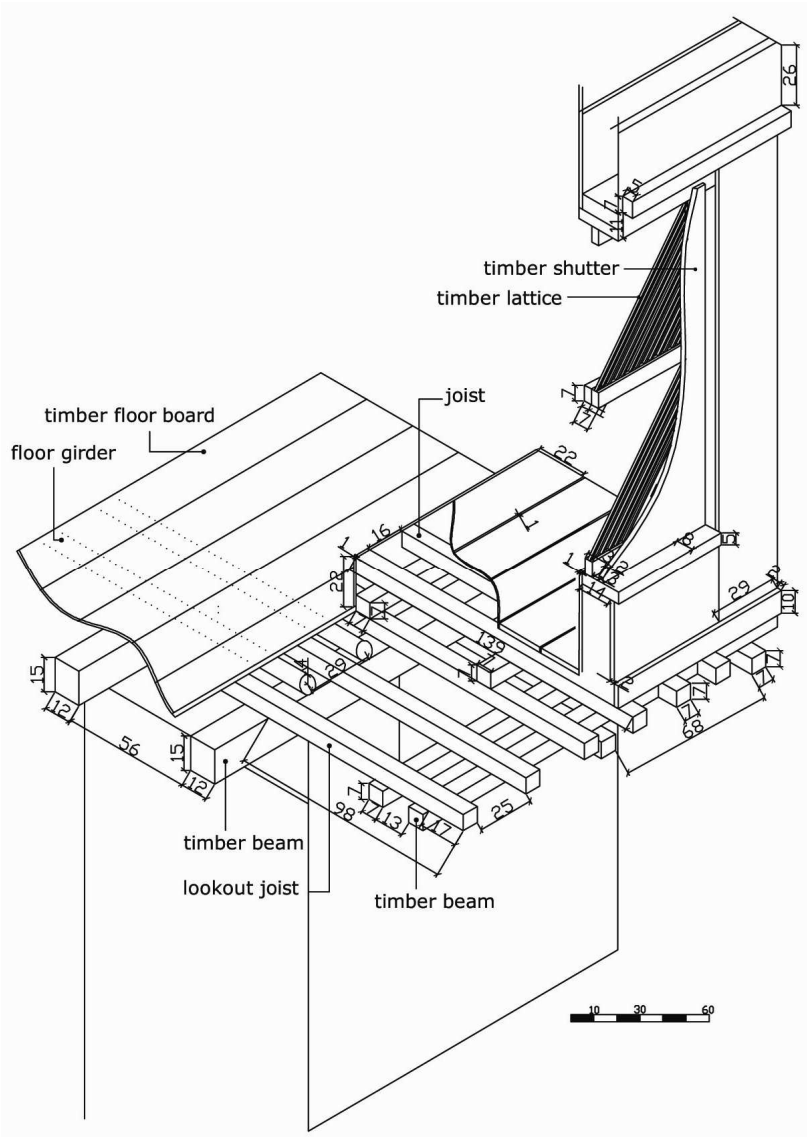


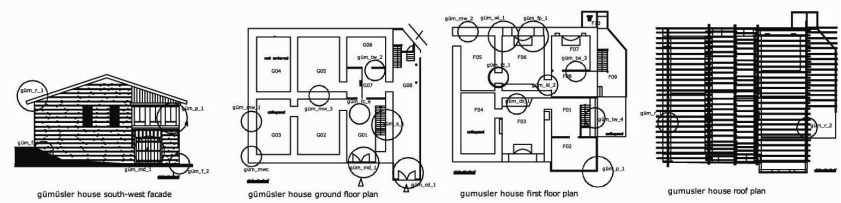
Figure 48 Record card of the detail of the projection of the Gümüşler House. Çelik, 2008.

Figure 49 View from projection of the Gümüşler House. Çelik,2008

Figure 50 View from projection of the Gümüşler House. Çelik,2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_c_2

DETAIL OF THE CEILING



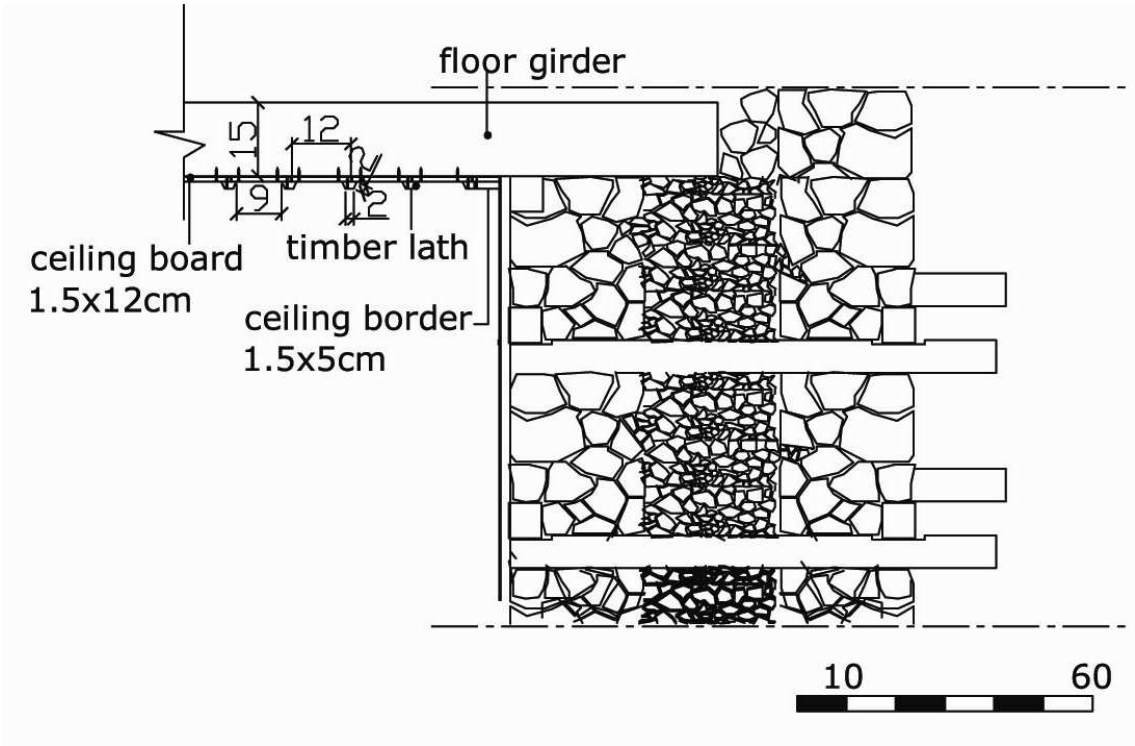


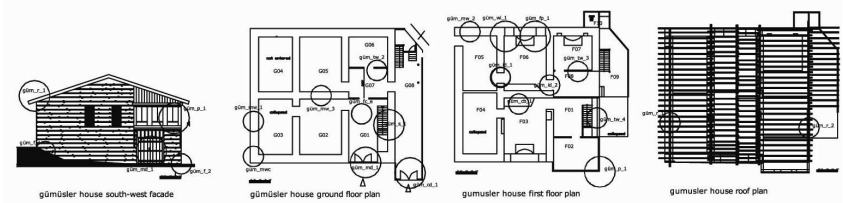
Figure 51 Record card of the detail of the ceiling of the Gümüşler House. Çelik, 2008.

Figure 52 View from ceiling of the Gümüşler House. Çelik,2008

Figure 53 View from roof of the Gümüşler House. Çelik,2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_r_1

DETAIL OF THE ROOF



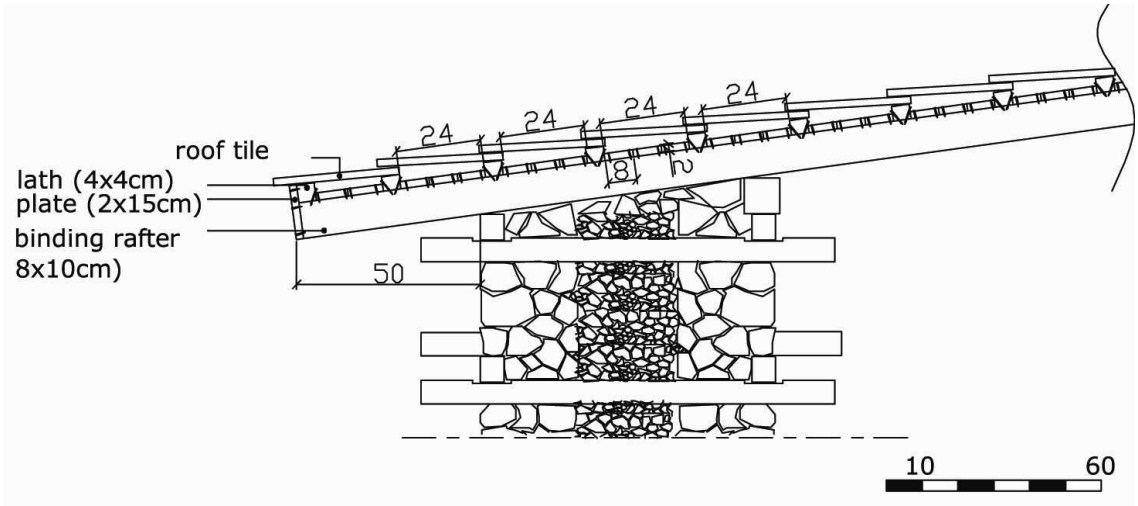
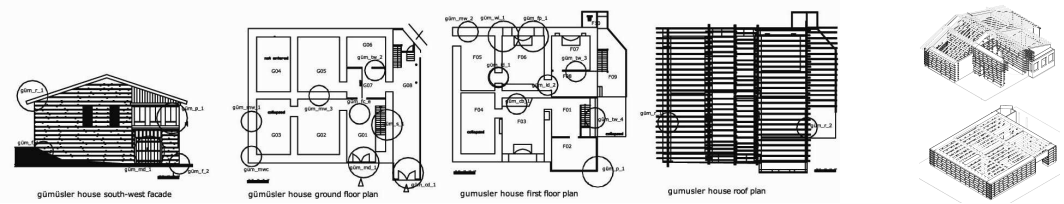
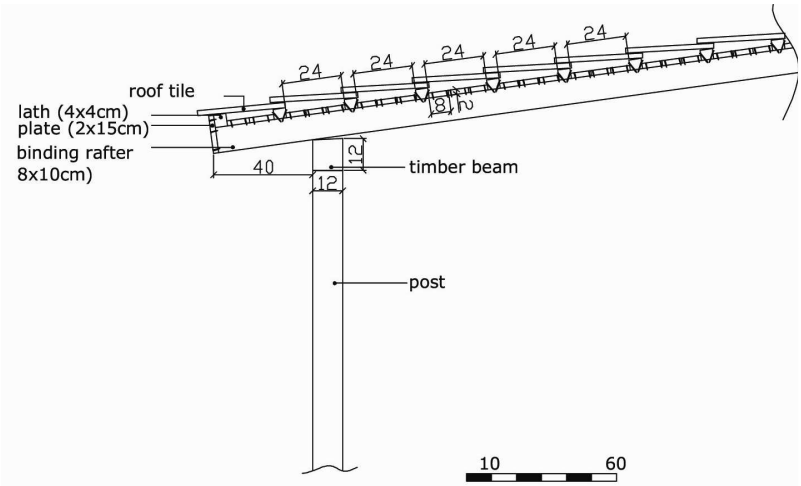


Figure 54 Record card of the detail of the roof of the Gümüşler House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_r_2

DETAIL OF THE ROOF





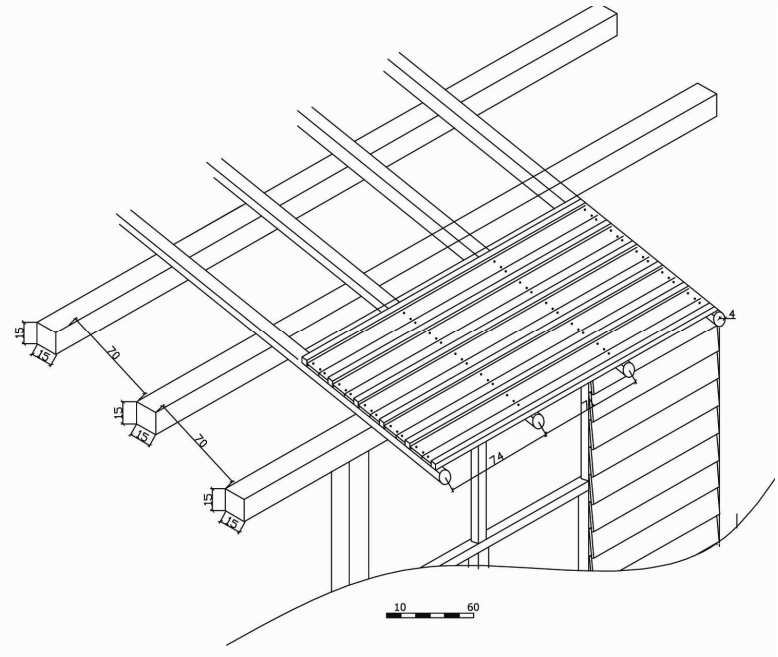
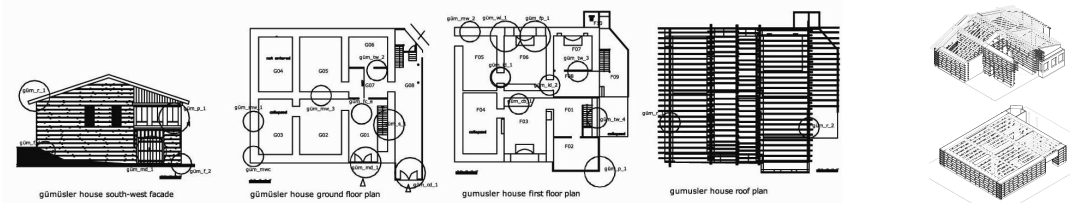


Figure 55 Record card of the detail of the roof of the Gümüşler House. Çelik, 2008.

Figure 56 View from roof of the Gümüşler House. Çelik,2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code:güm_s_1

DETAIL OF THE STAIR



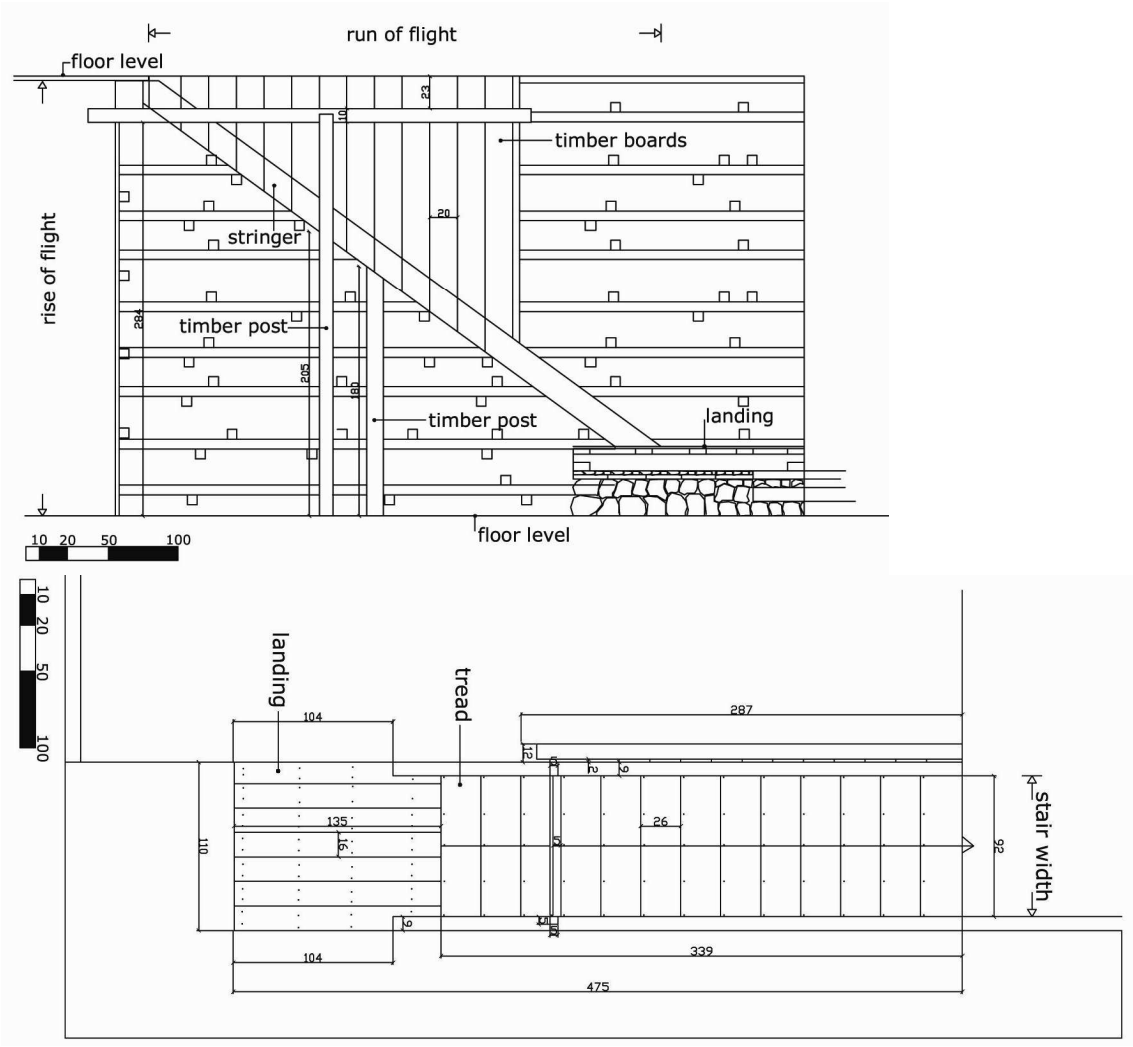
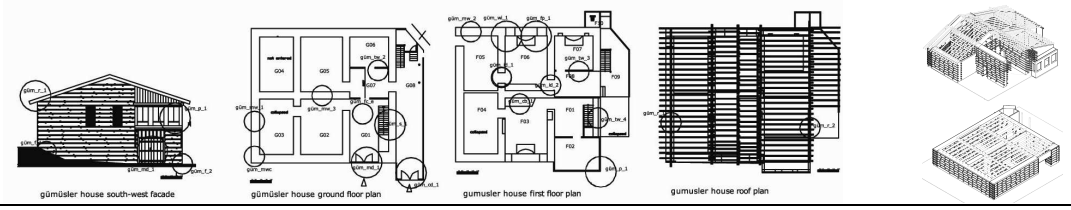


Figure 57 Record card of the stair of the Gümüşler House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_s_1

DETAIL OF THE STAIR



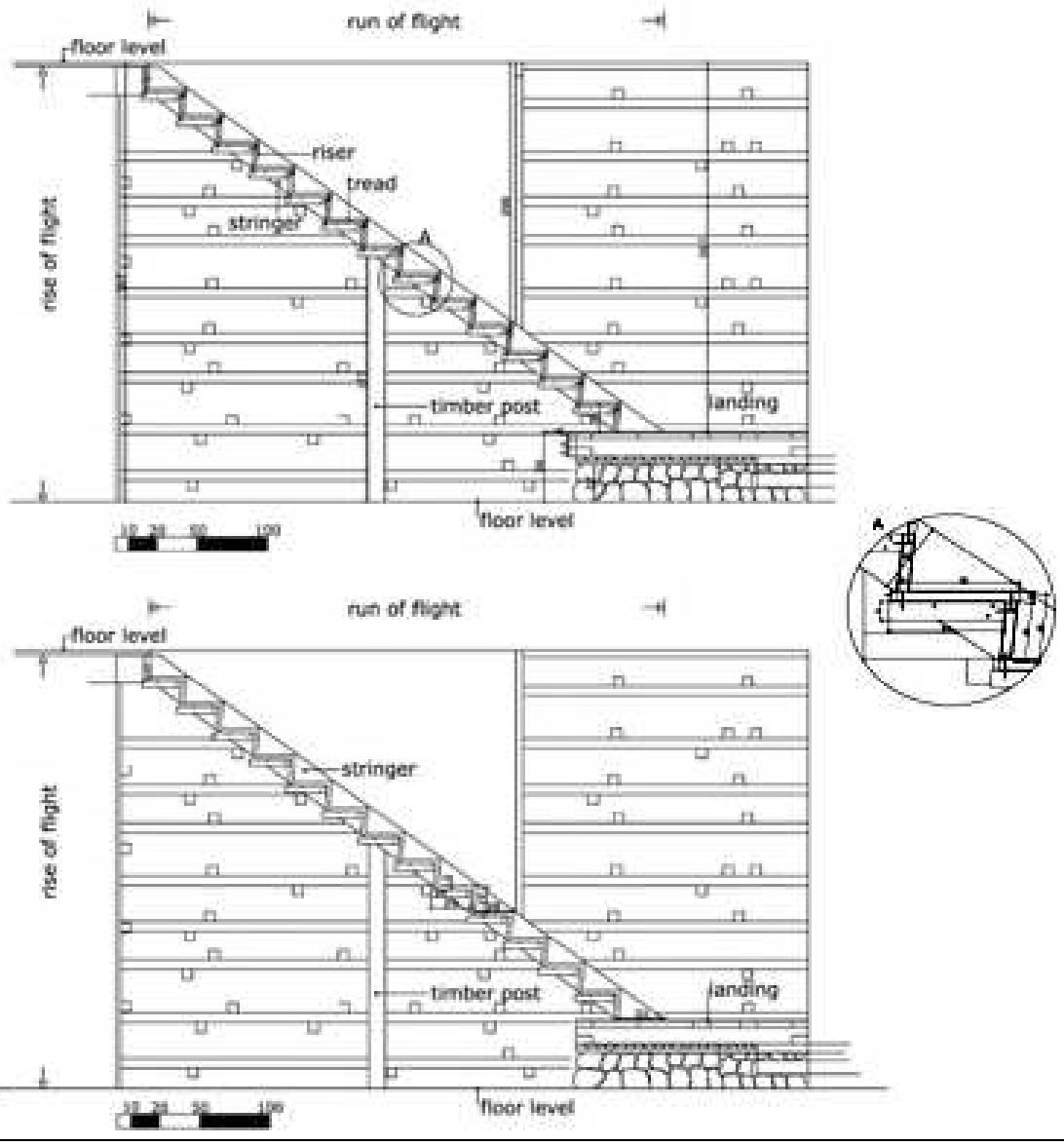


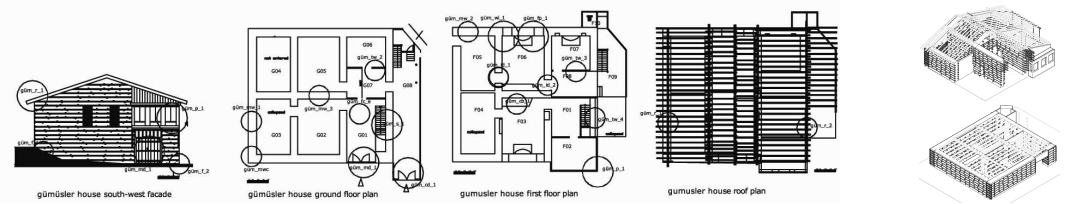
Figure 58 Record card of the stair of the Gümüşler House. Çelik, 2008.

Figure 59 View from stair of the Gümüşler House. Çelik,2008

Figure 60 View from stair of the Gümüşler House. Çelik,2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_cd_1

DETAIL OF THE COURTYARD DOOR



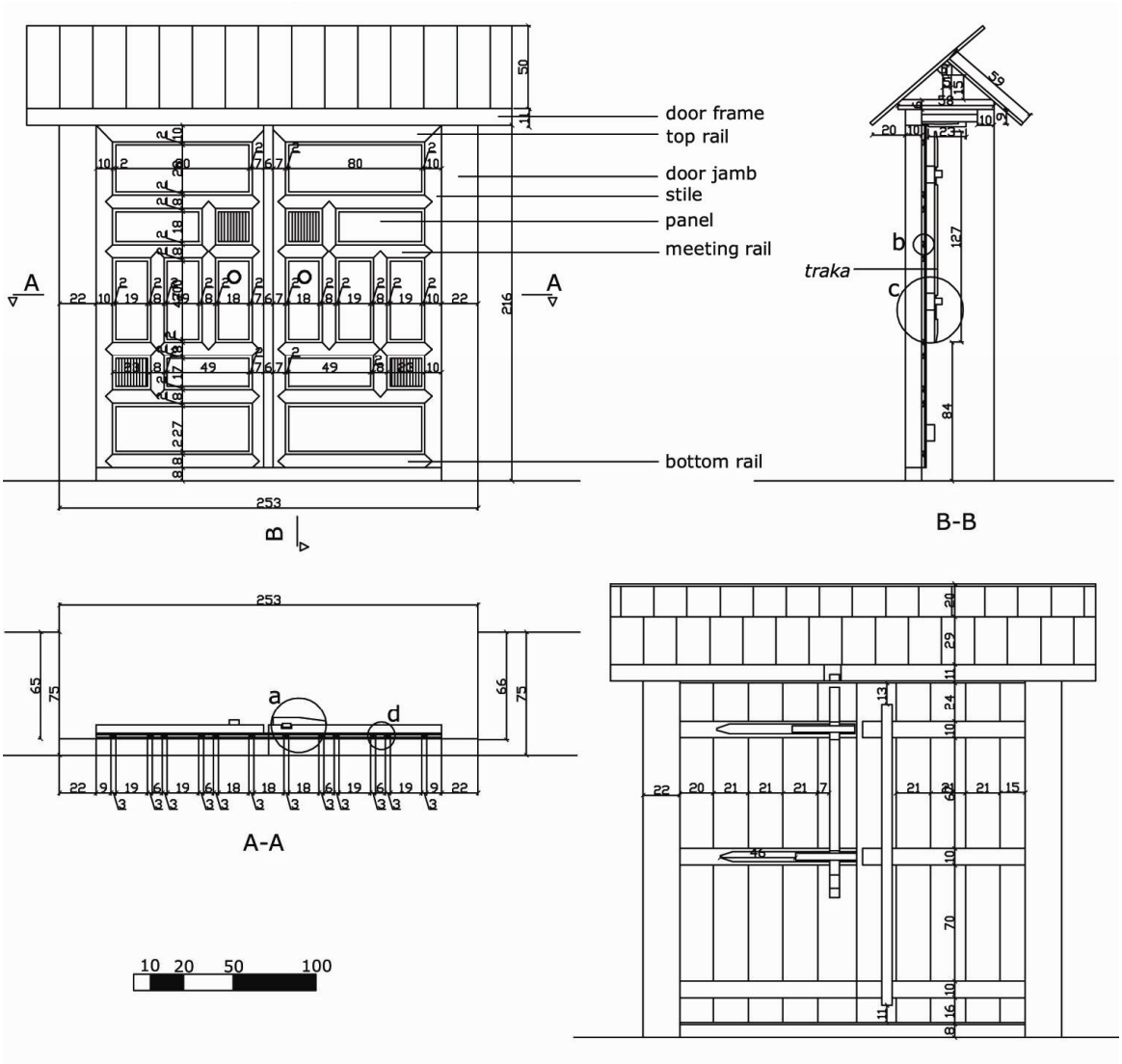
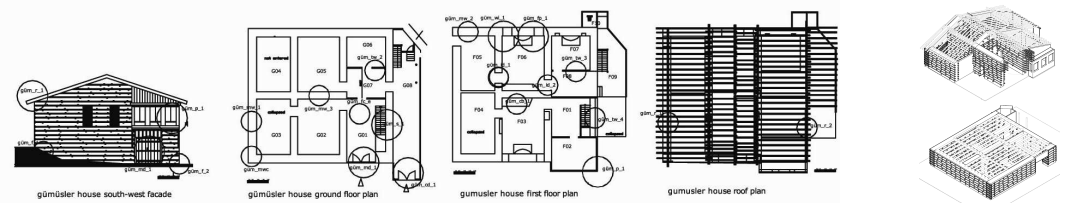


Figure 61 Record card of the courtyard door of the Gümüşler House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_cd_1

DETAIL OF THE COURTYARD DOOR



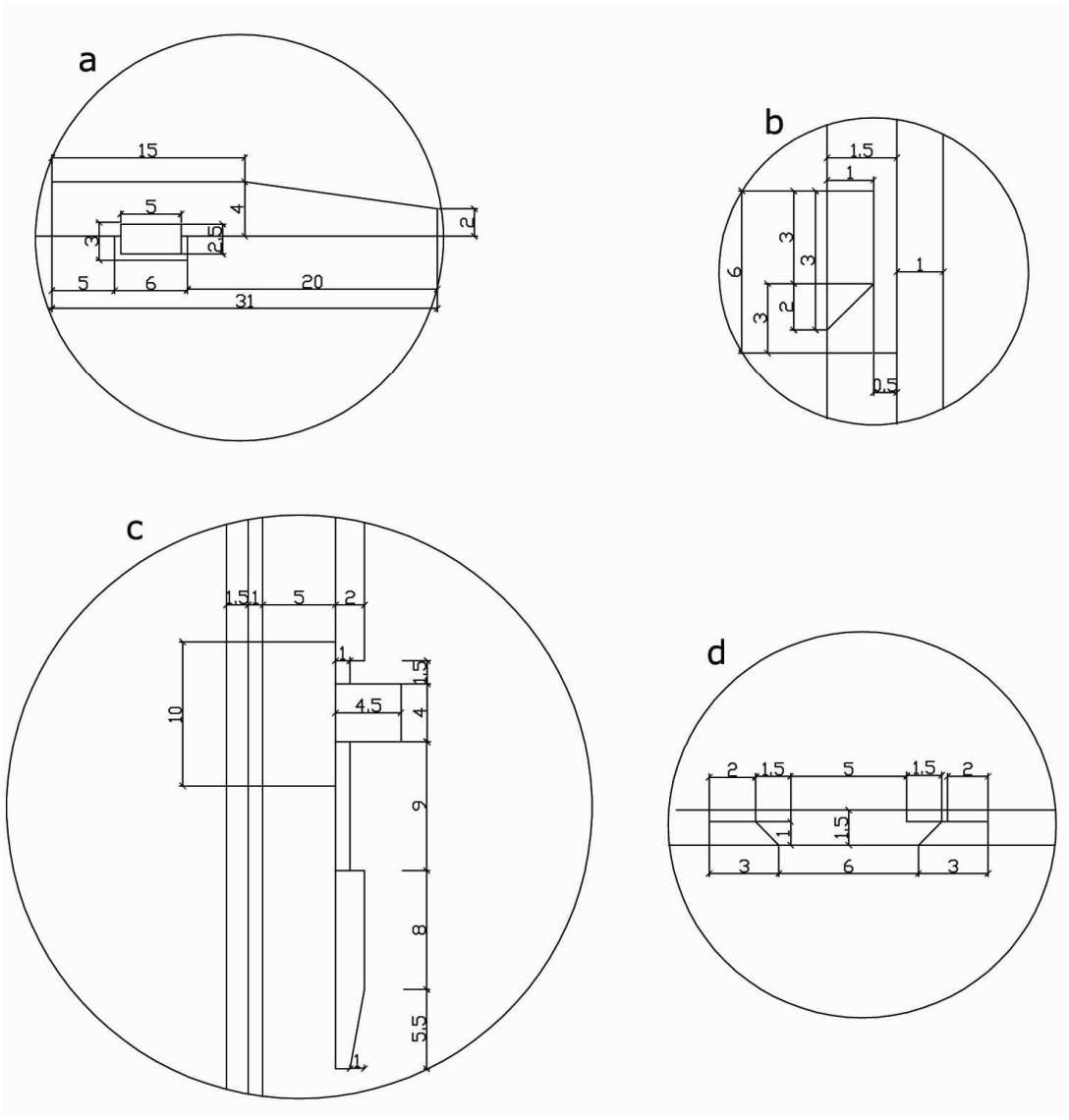


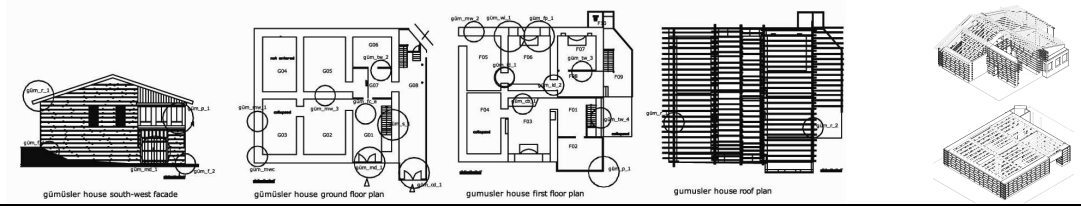
Figure 62Record card of the courtyard door of the Gümüşler House. Çelik, 2008.

Figure 63 View from courtyard door of the Gümüşler House. Çelik,2008

Figure 64 View from courtyard door of the Gümüşler House. Çelik,2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_md_1

DETAIL OF THE MAIN DOOR



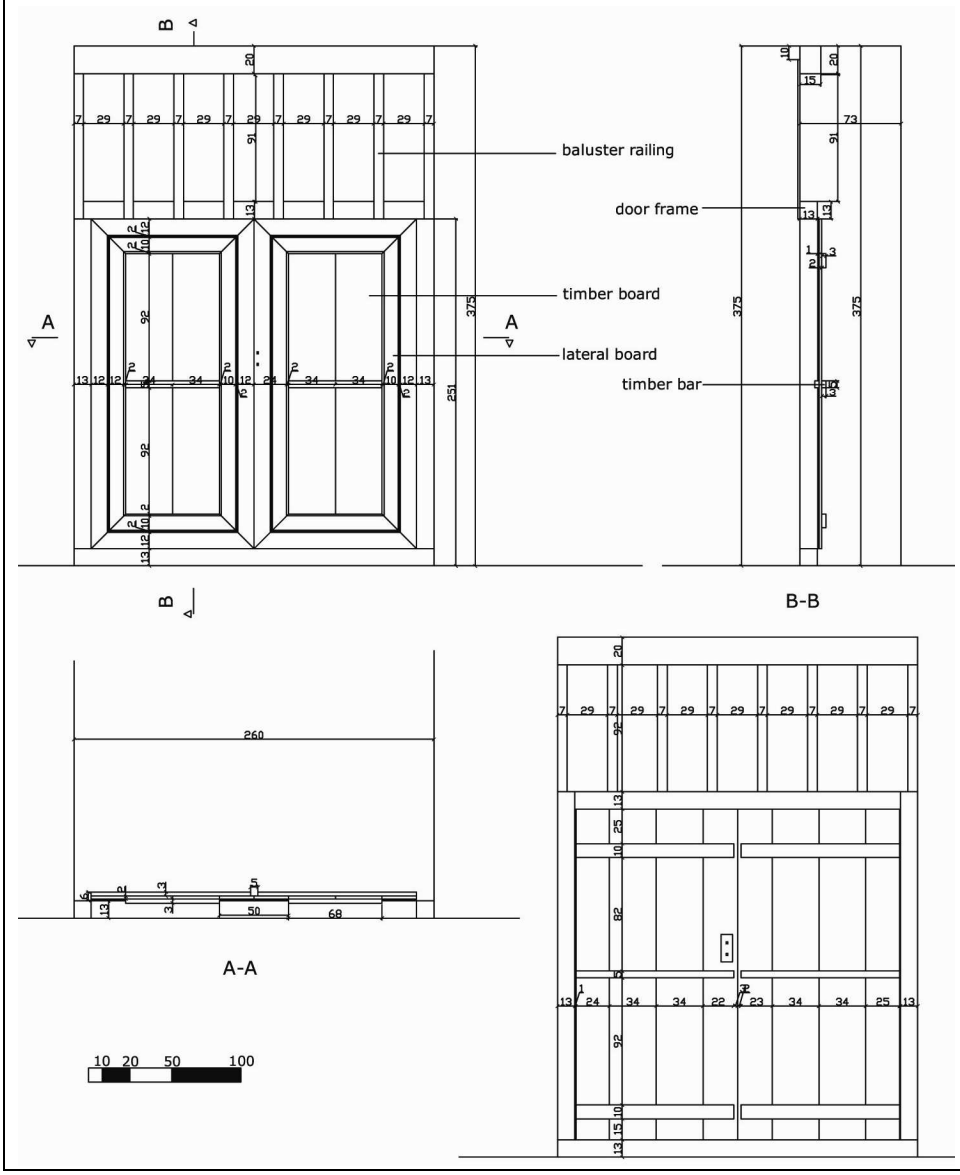


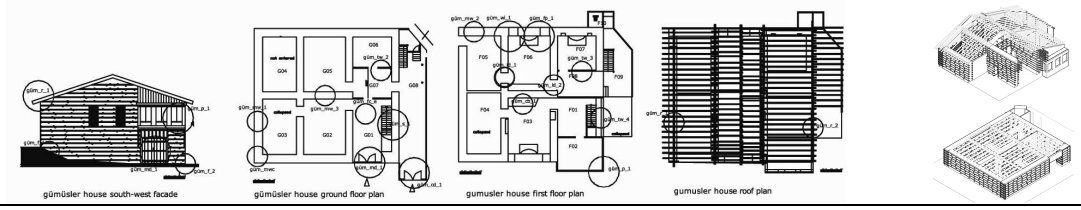
Figure 65 Record card of the main door of the Gümüşler House. Çelik, 2008.

Figure 66 View from main door of the Gümüşler House. Çelik,2008

Figure 67 View from main door of the Gümüşler House. Çelik,2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_id_1

DETAIL OF THE INTERIOR DOOR



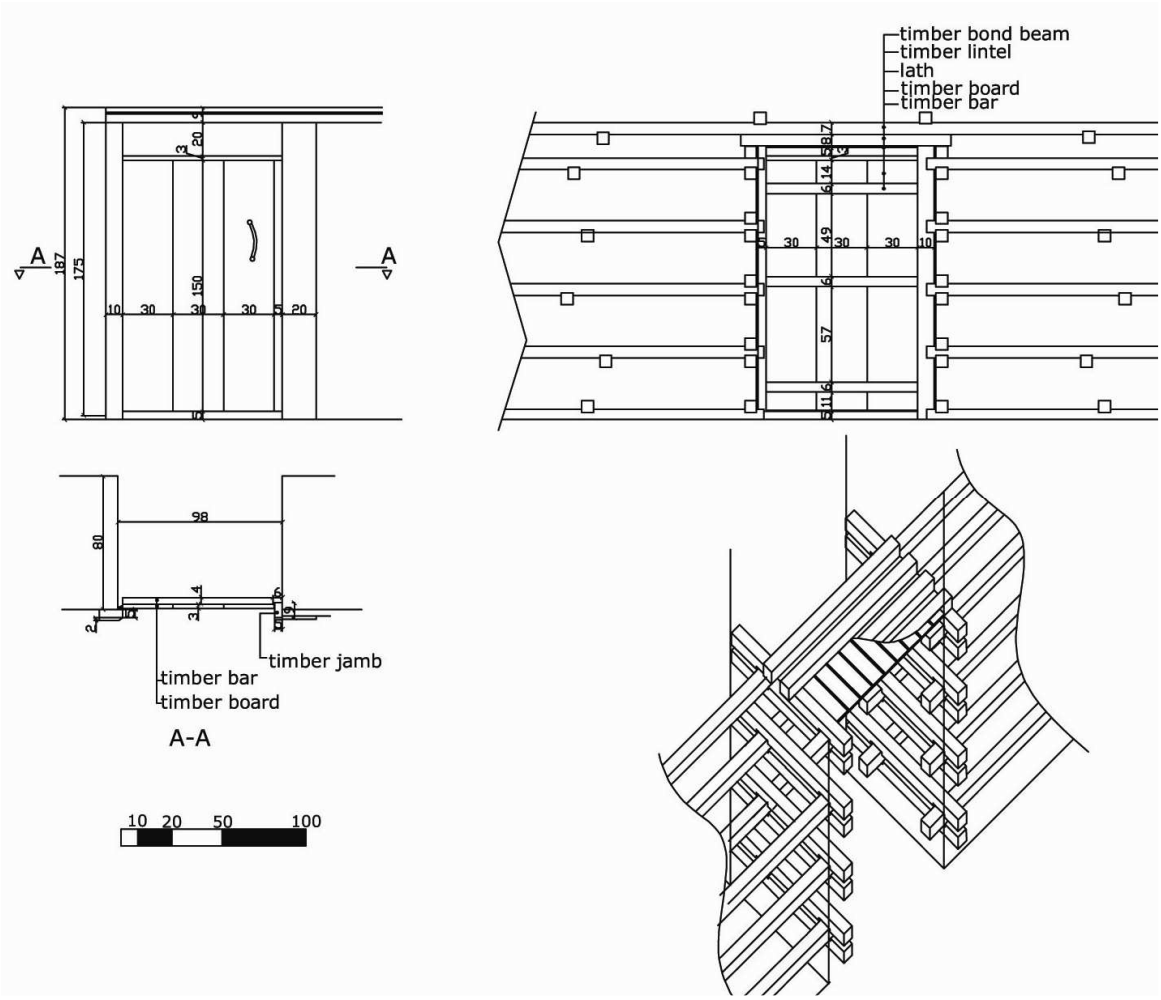


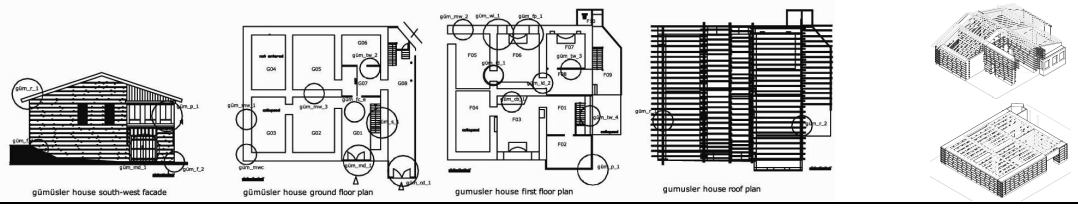
Figure 68 Record card of the interior door of the Gümüşler House. Çelik, 2008.

Figure 69 View from interior door of the Gümüşler House. Çelik,2008

Figure 70 View from interior door of the Gümüşler House. Çelik,2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_id_2

DETAIL OF THE INTERIOR DOOR



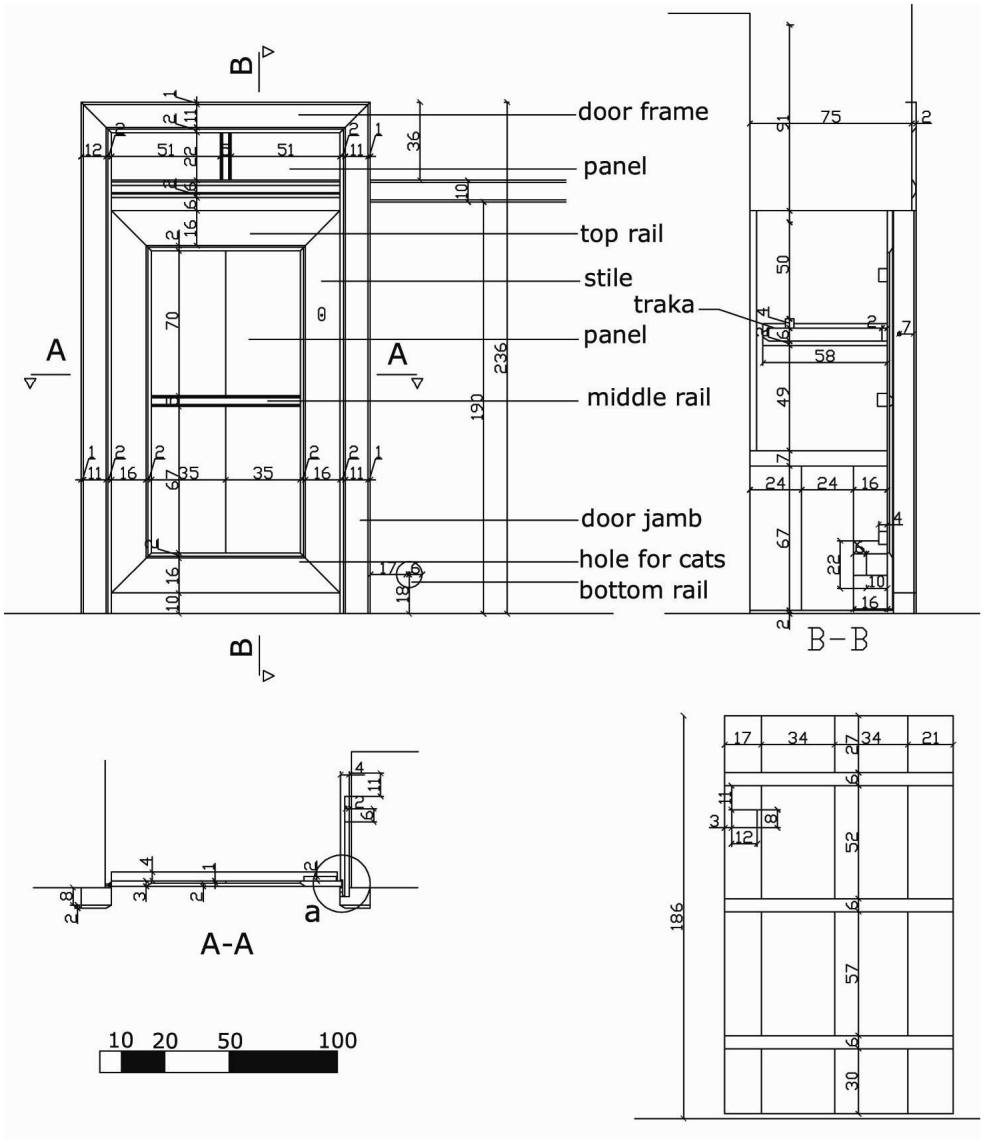
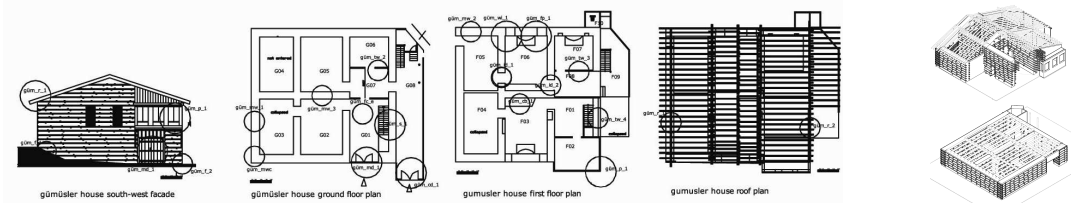


Figure 71 Record card of the interior door of the Gümüşler House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_id_2

DETAIL OF THE TRAKA



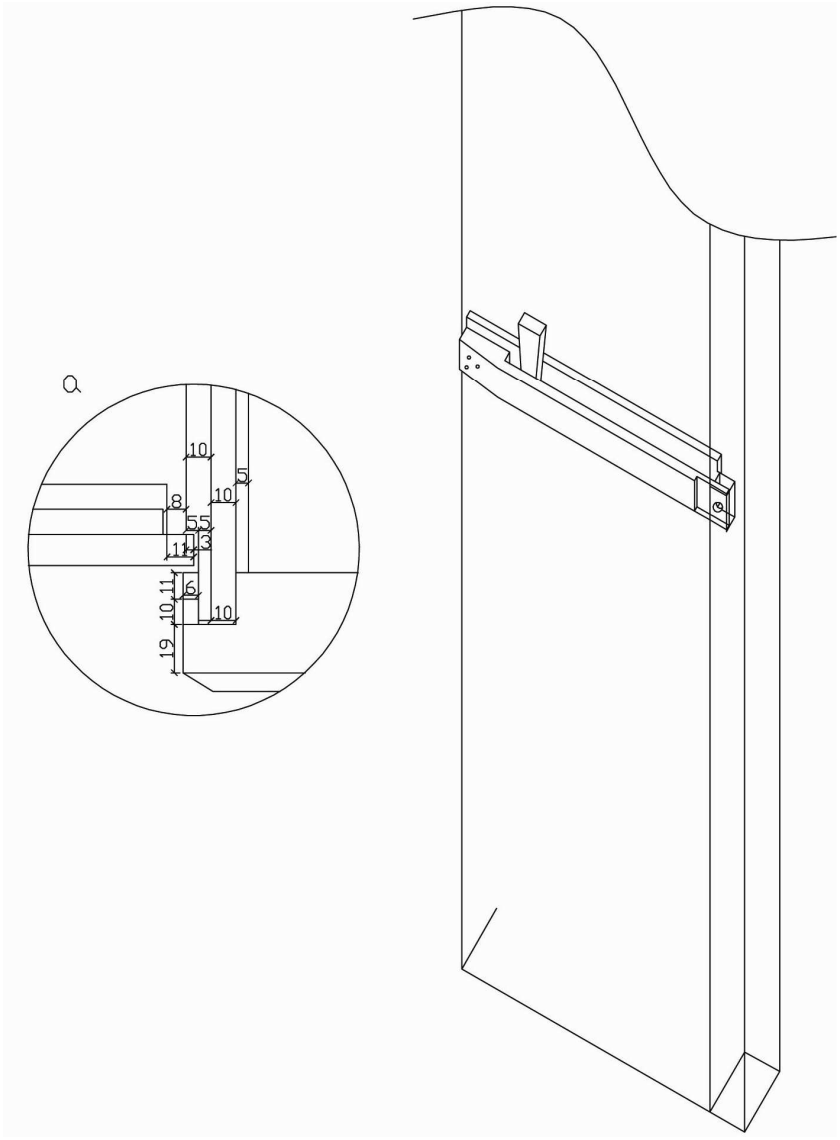


Figure 72 Record card of the traka. Çelik, 2008.

Figure 73 View from interior door of the Gümüşler House. Çelik,2008

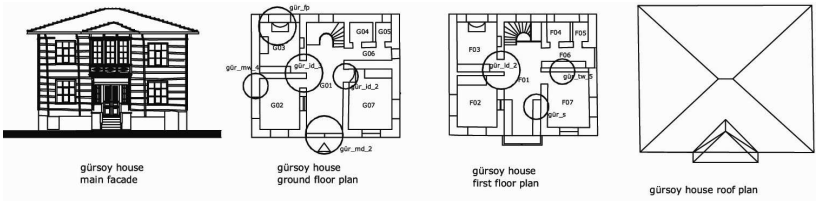
Figure 74 View from interior door of the Gümüşler House. Çelik,2008

Figure 75 View from the traka. Çelik,2008

Figure 76 View from the hole for cads. Çelik, 2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_fp

DETAIL OF THE FIRE PLACE



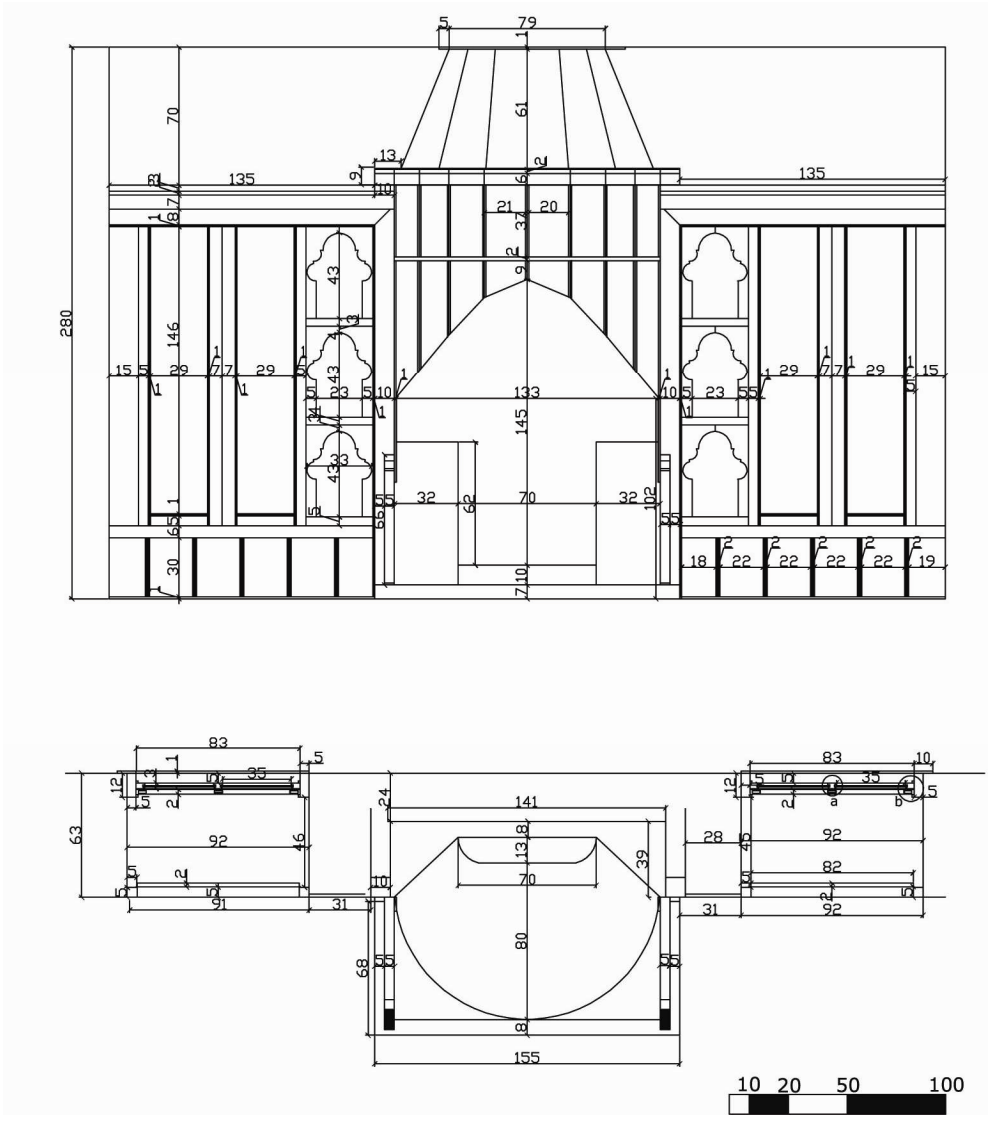
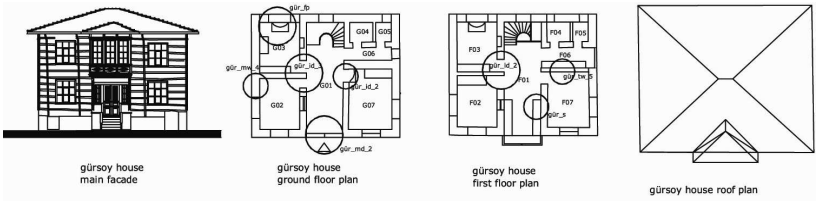


Figure 77 Record card of the fire place of the Gümüşler House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_fp

DETAIL OF THE FIRE PLACE



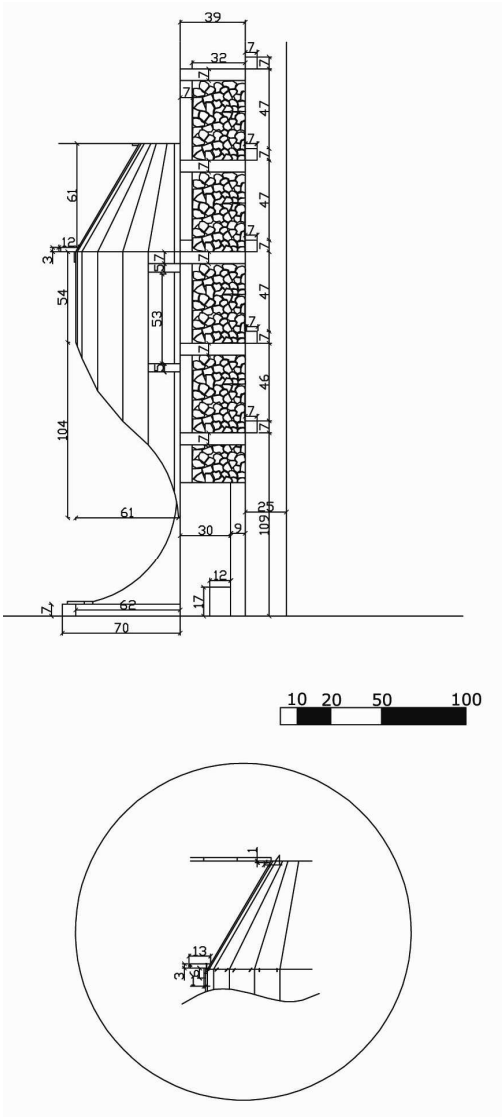
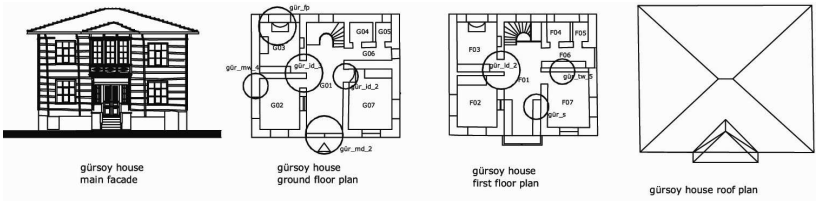


Figure 78 Record card of the fire place of the Gümüşler House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_w

DETAIL OF THE WINDOW



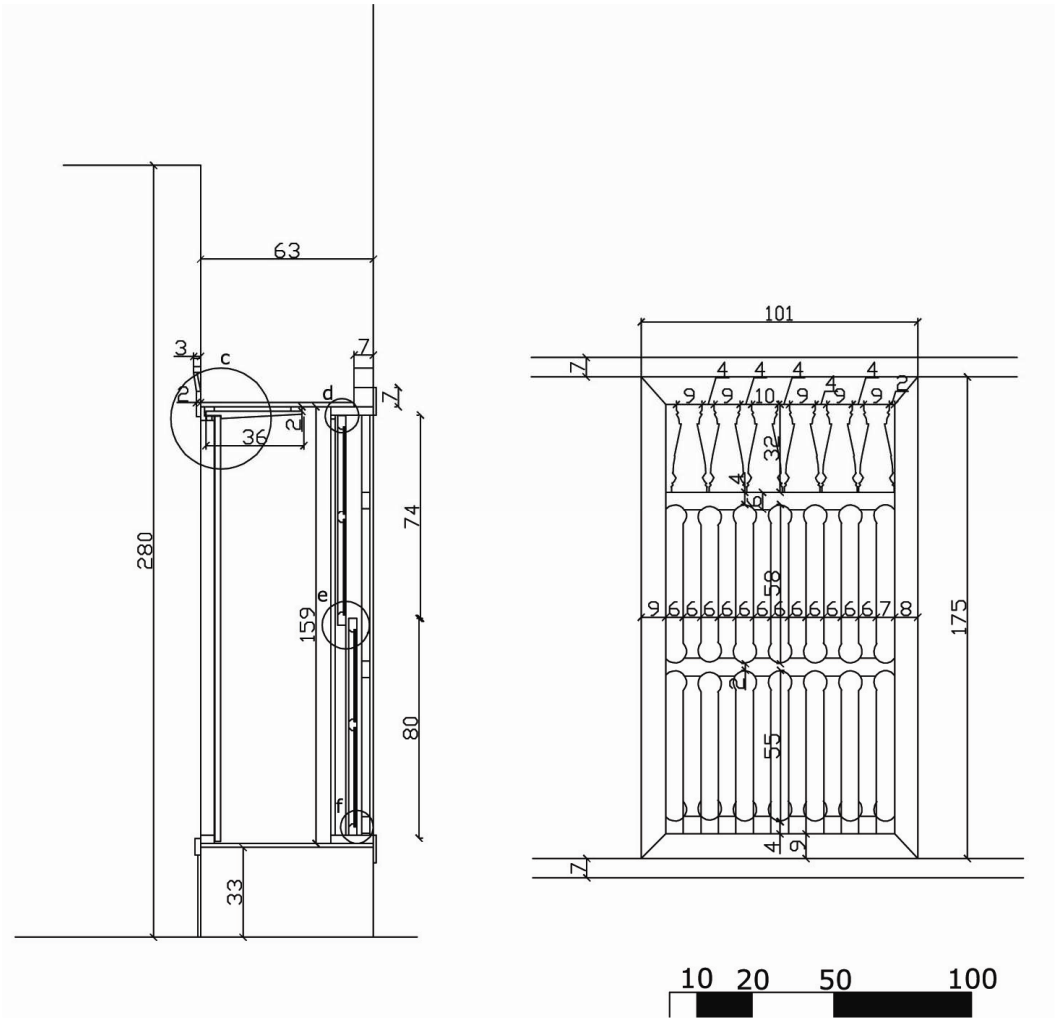
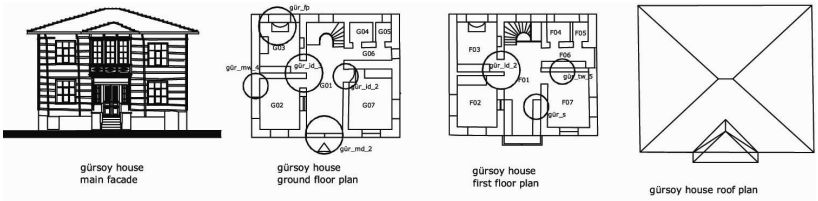


Figure 79 Record card of the window of the Gümüşler House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_w

DETAIL OF THE WINDOW



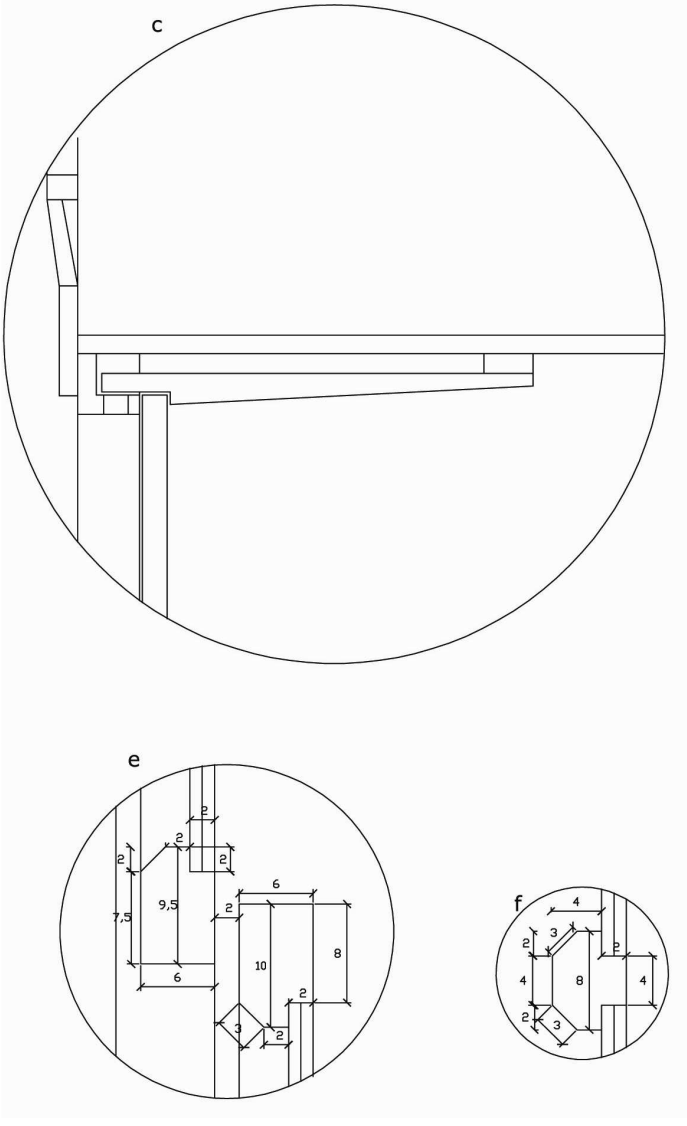
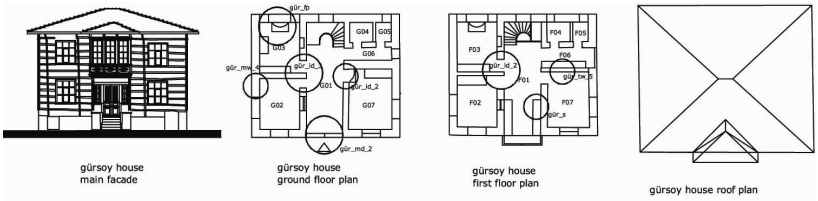


Figure 80 Record card of the window of the Gümüşler House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_w

DETAIL OF THE WINDOW



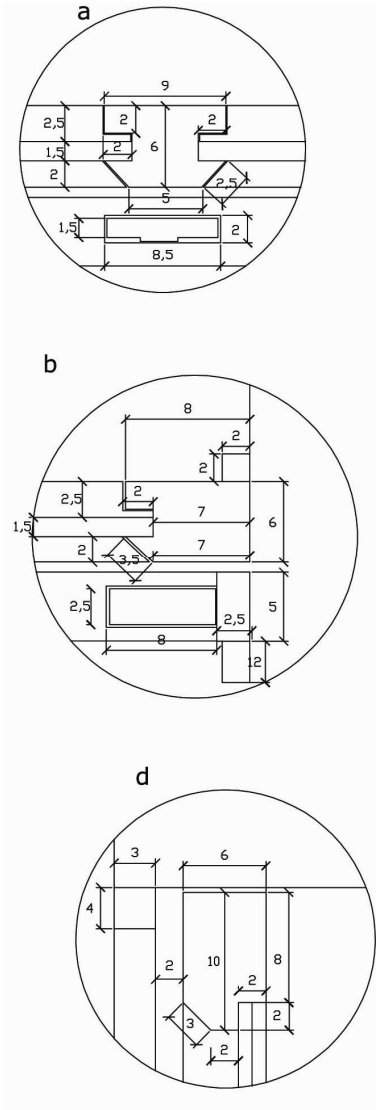
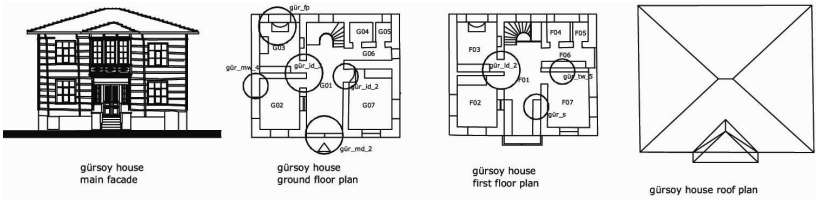


Figure 81 Record card of the window of the Gümüşler House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_fp_2

DETAIL OF THE FIRE PLACE



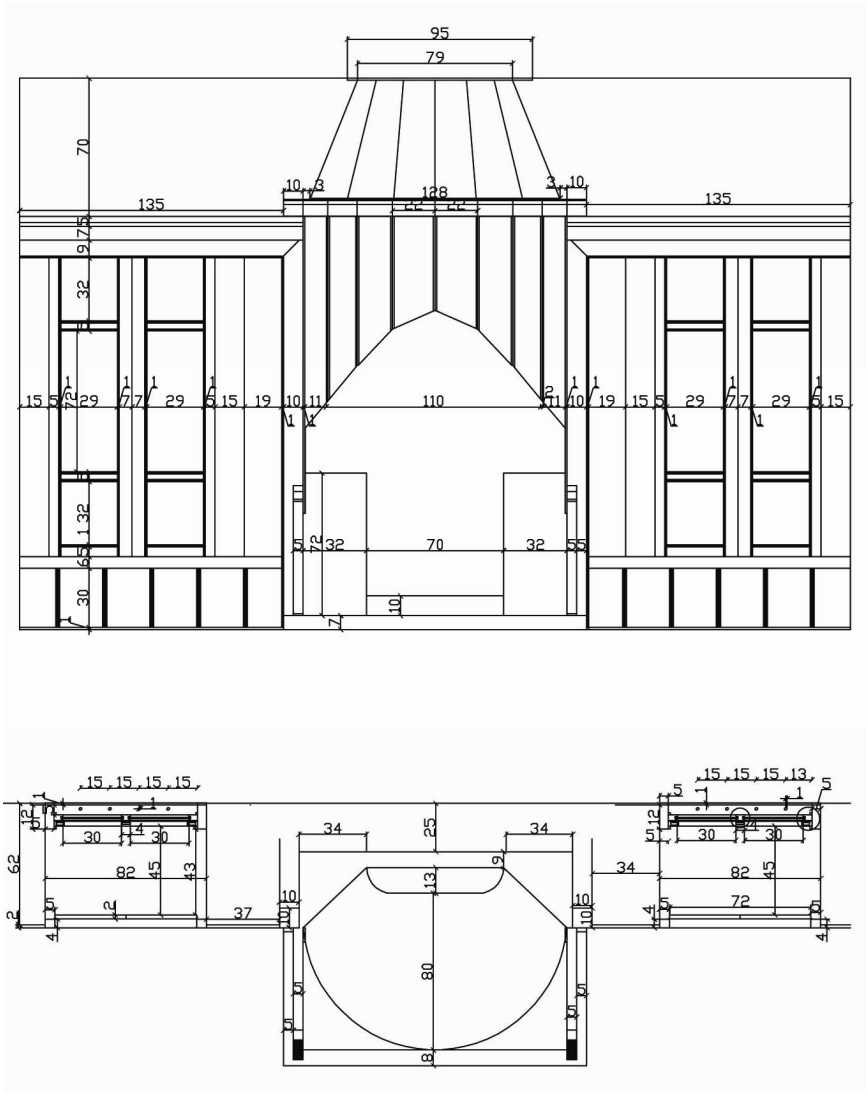
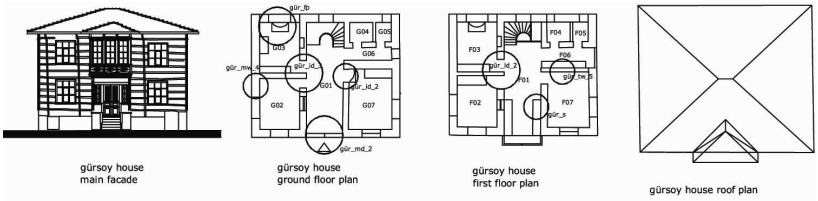


Figure 82 Record card of the fire place of the Gümüşler House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_fp_2

DETAIL OF THE FIRE PLACE



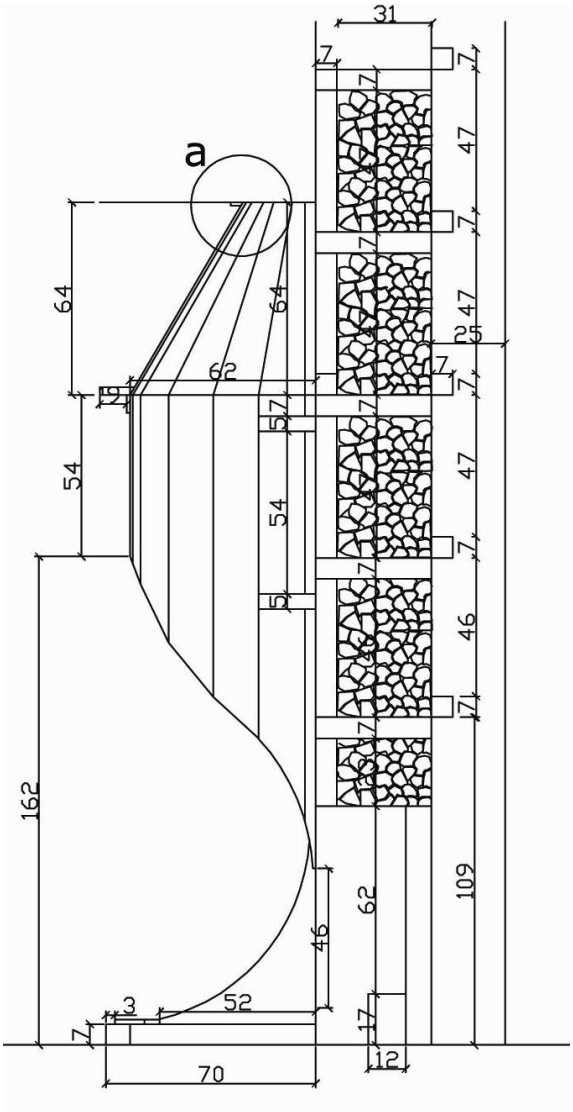
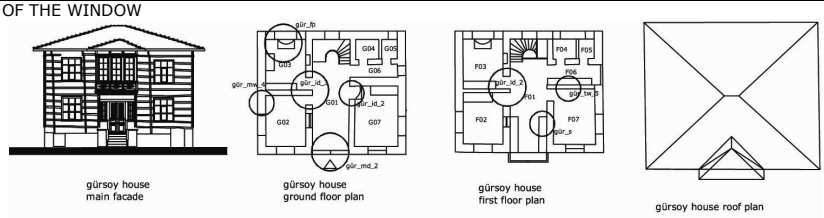


Figure 83 Record card of the fire place of the Gümüşler House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_w

DETAIL OF THE WINDOW



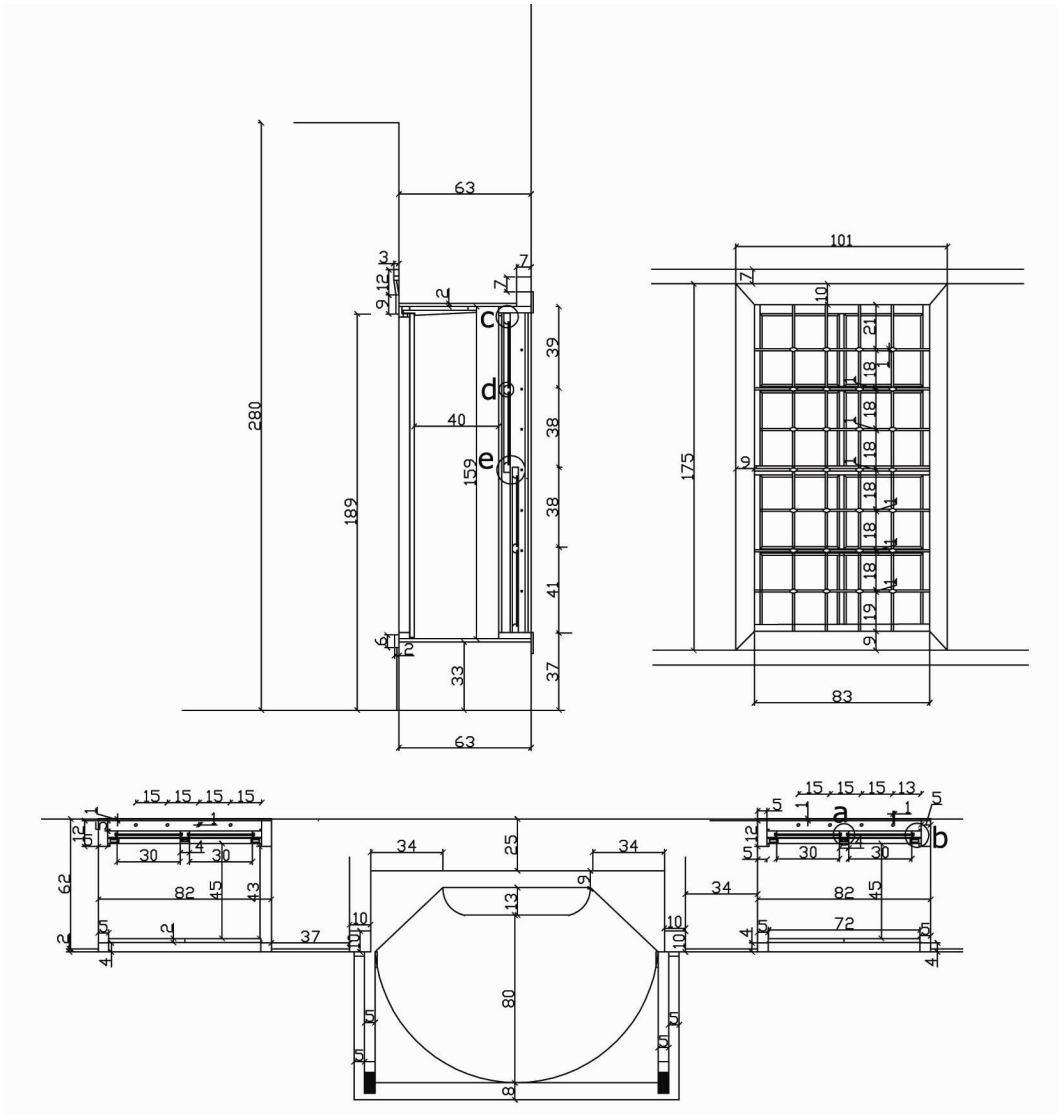
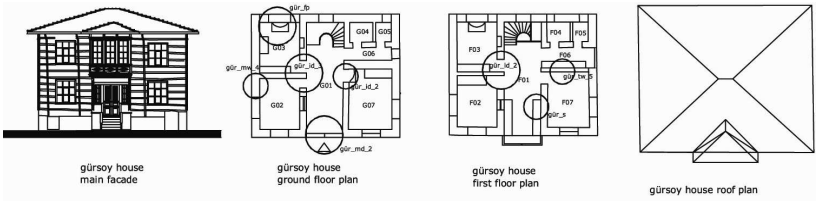


Figure 84 Record card of the window of the Gümüşler House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜMÜŞLER HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: güm_w

DETAIL OF THE WINDOW



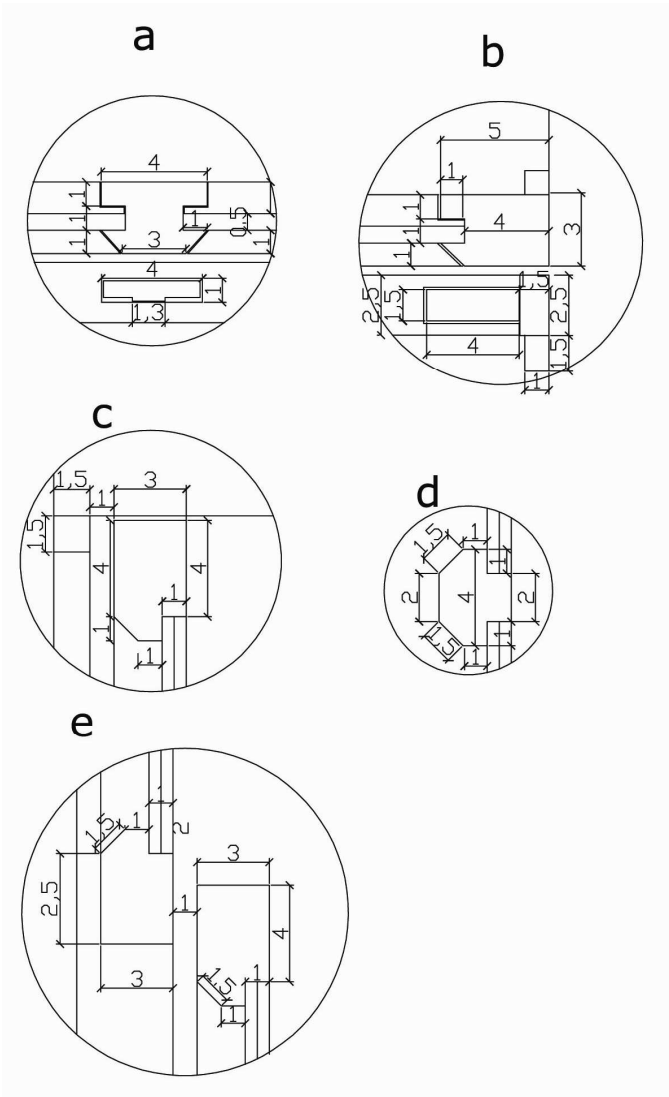


Figure 85 Record card of the window of the Gümüşler House. Çelik, 2008.

Figure 86 View from the fire place. Çelik, 2008

Figure 87 View from the window. Çelik, 2008

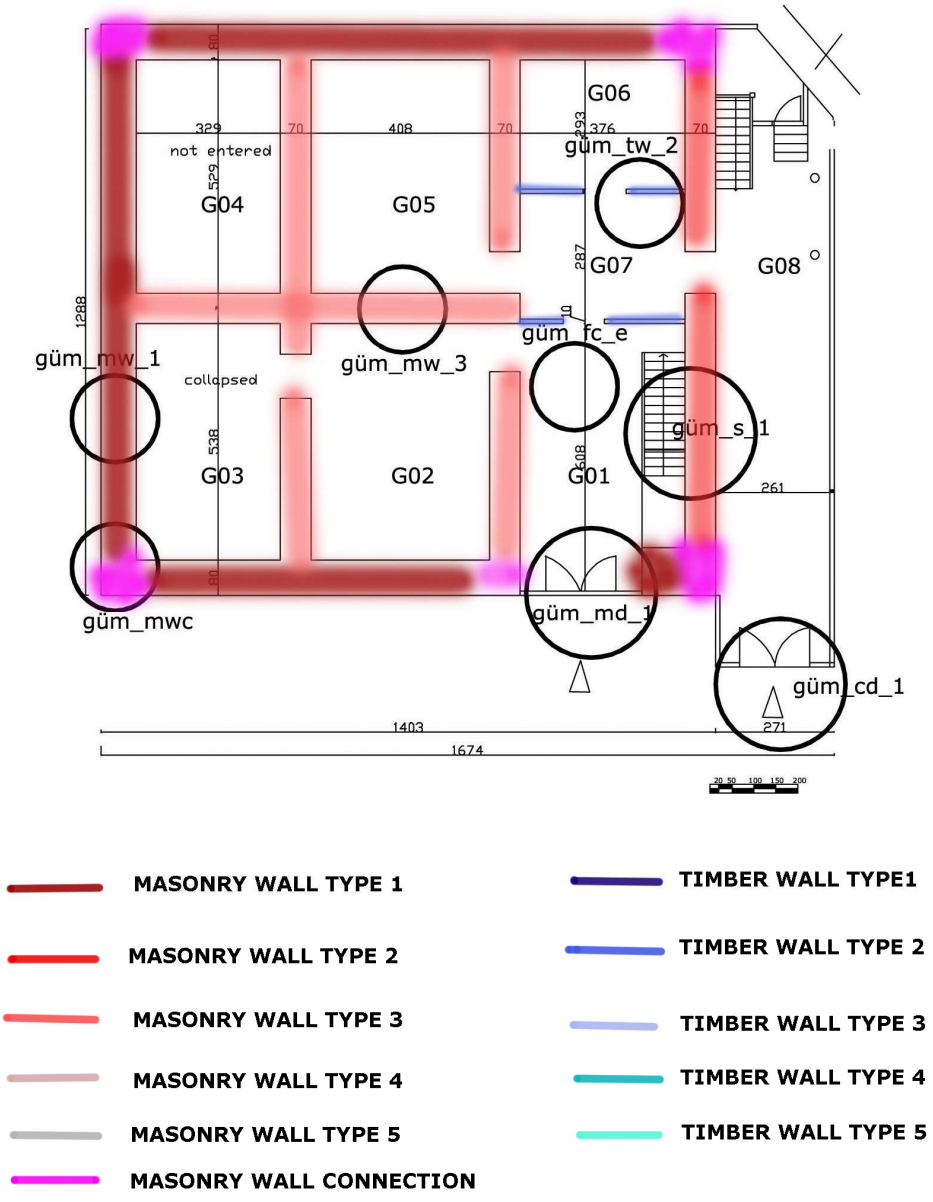


Figure 88 Distrubiton of the wall types of Gümüşler House. Çelik, 2008

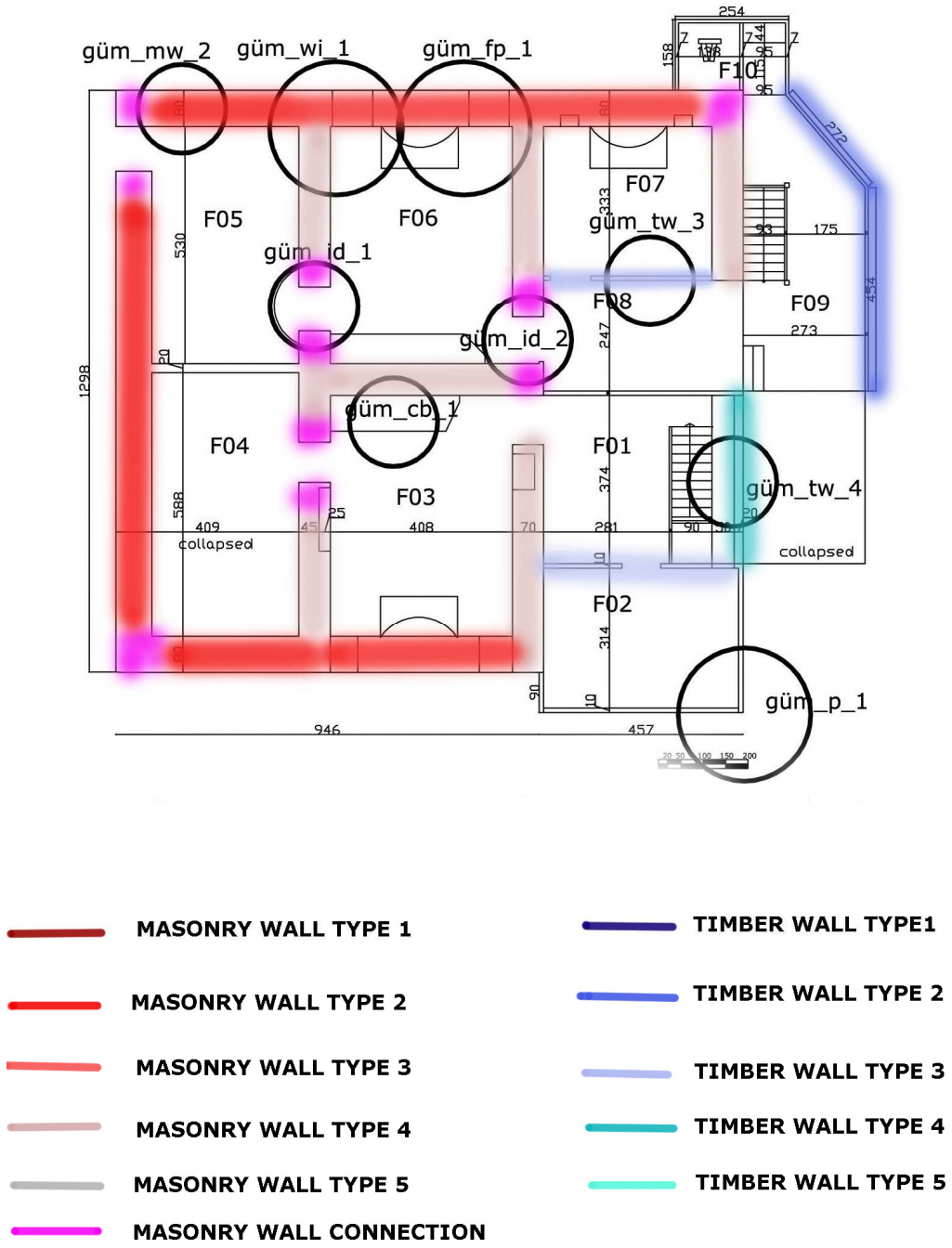


Figure 89 Distrubiton of the wall types of Gümüşler House. Çelik, 2008

APPENDIX C

DRAWINGS AND FIGURES RELATED TO THE GÜRSOY HOUSE

Figure 90 The drawing of the façade of Gürsoy House. Çelik, 2008.

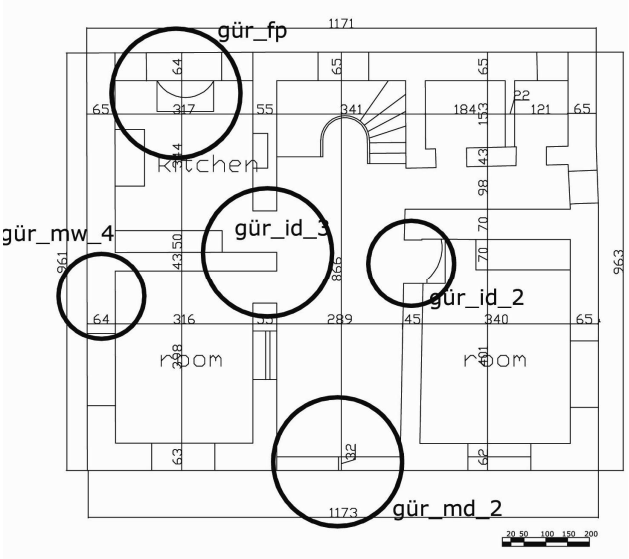


Figure 91 Ground floor plan of the Gürsoy House. Çelik, 2008.

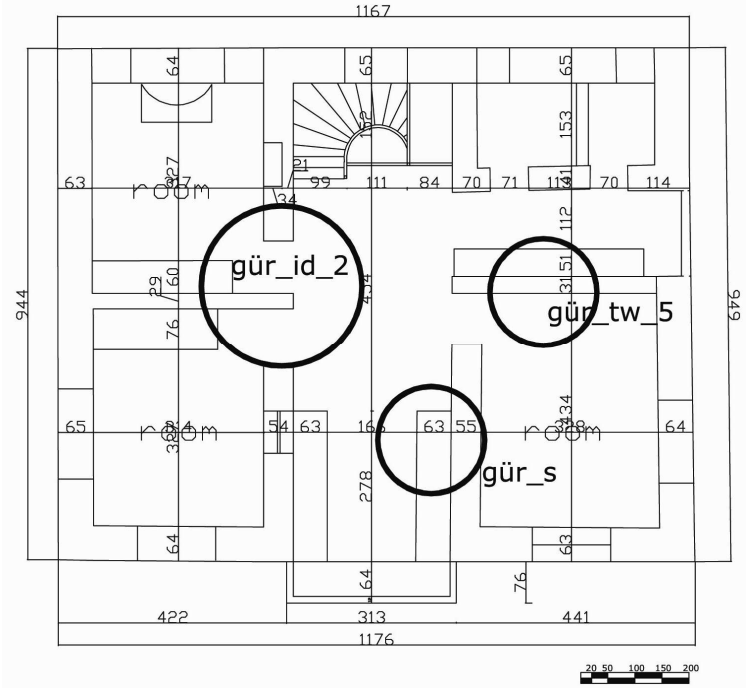


Figure 92 First floor plan of the Gürsoy House. Çelik, 2008.

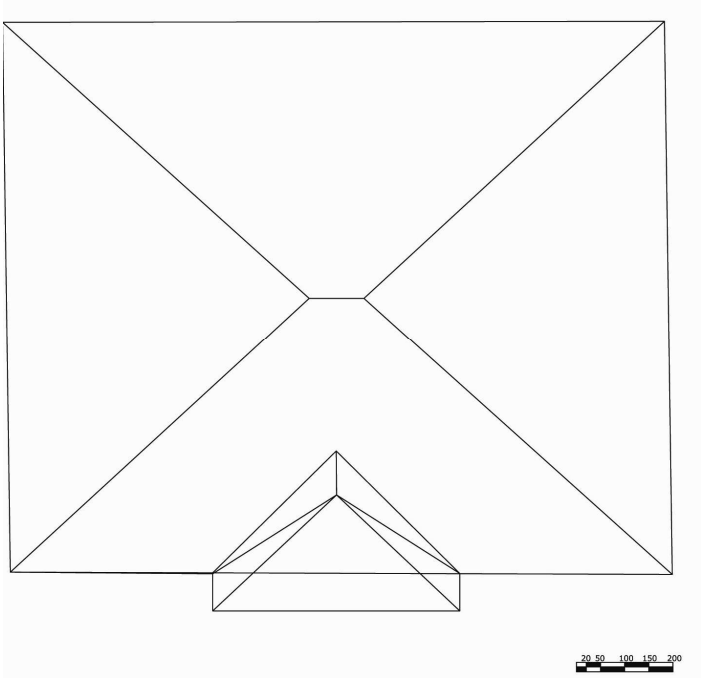
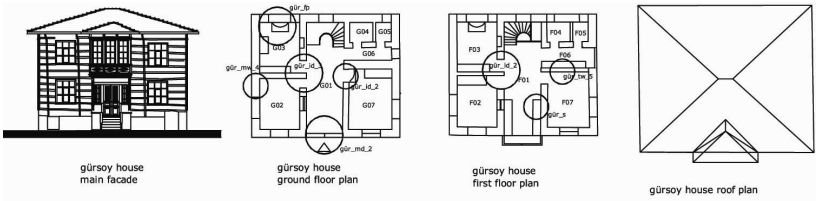


Figure 93 Roof plan of the Gürsoy House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜRSOY HOUSE Adress:
	Code: gür_mw_4

DETAIL OF WALL



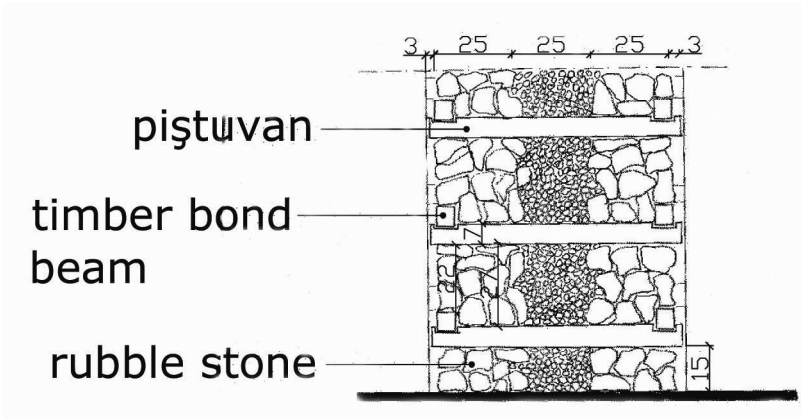
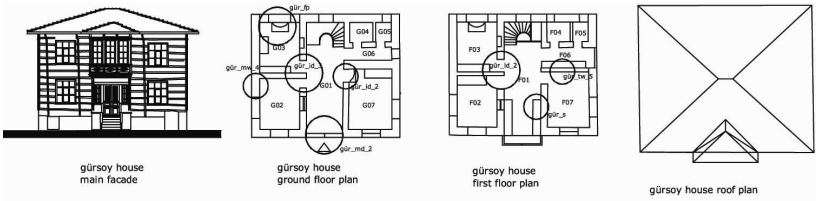


Figure 94Record card of the detail of the wall of the Gürsoy House. Çelik, 2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜRSOY HOUSE Adress:
	Code: gür_tw_5

DETAIL OF THE TIMBER WALL



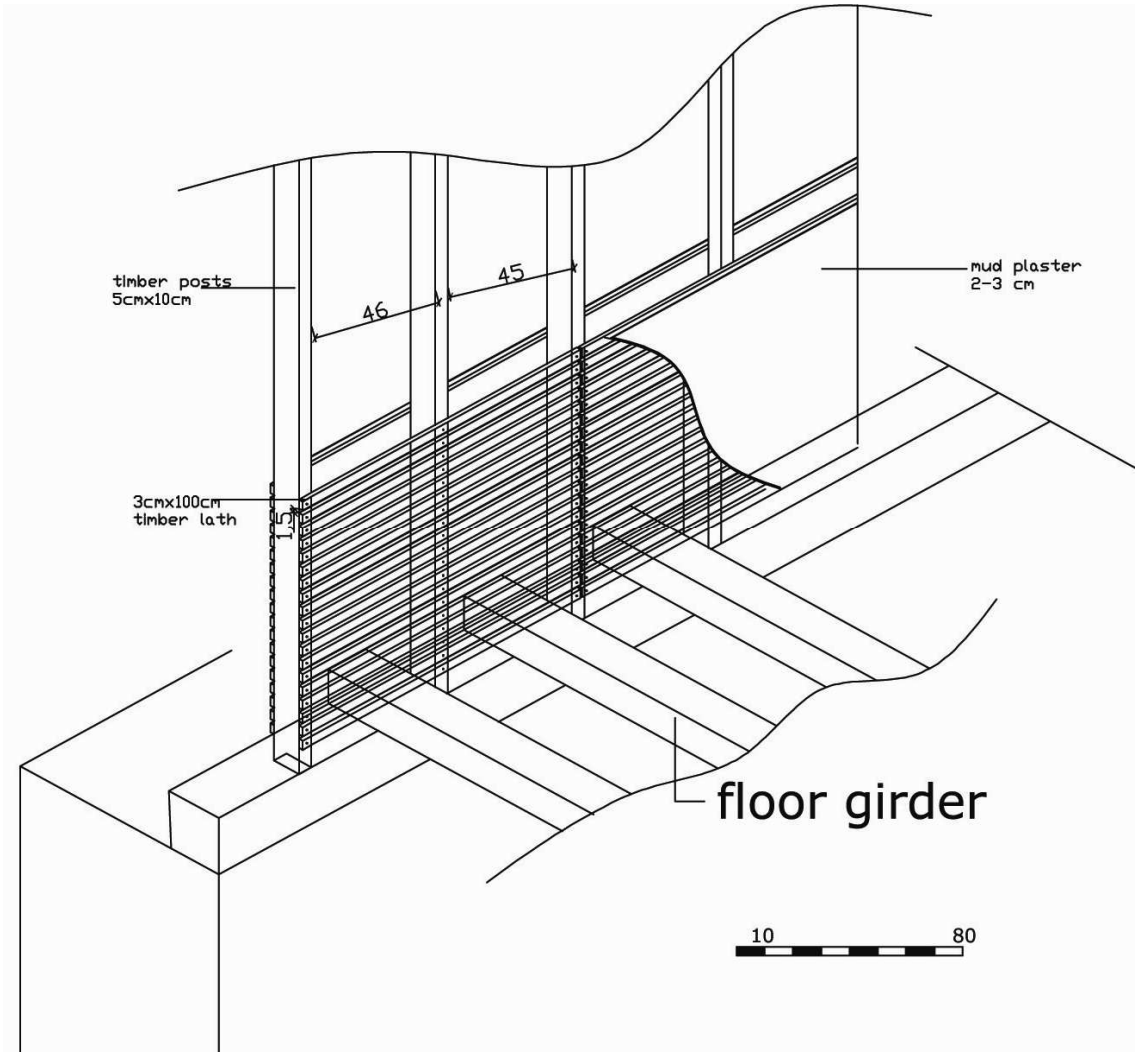
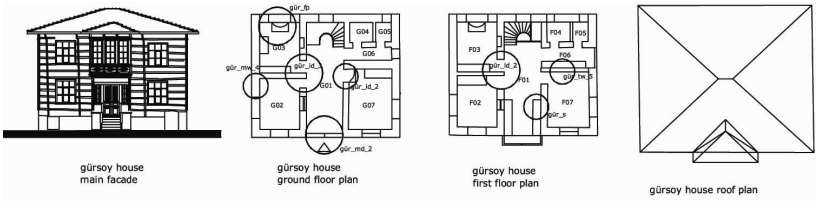


Figure 95 Record card of the detail of the wall of the Gürsoy House. Çelik, 2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜRSOY HOUSE Adress: Ormana
	Code: gür_fc_1

DETAIL OF THE FLOOR



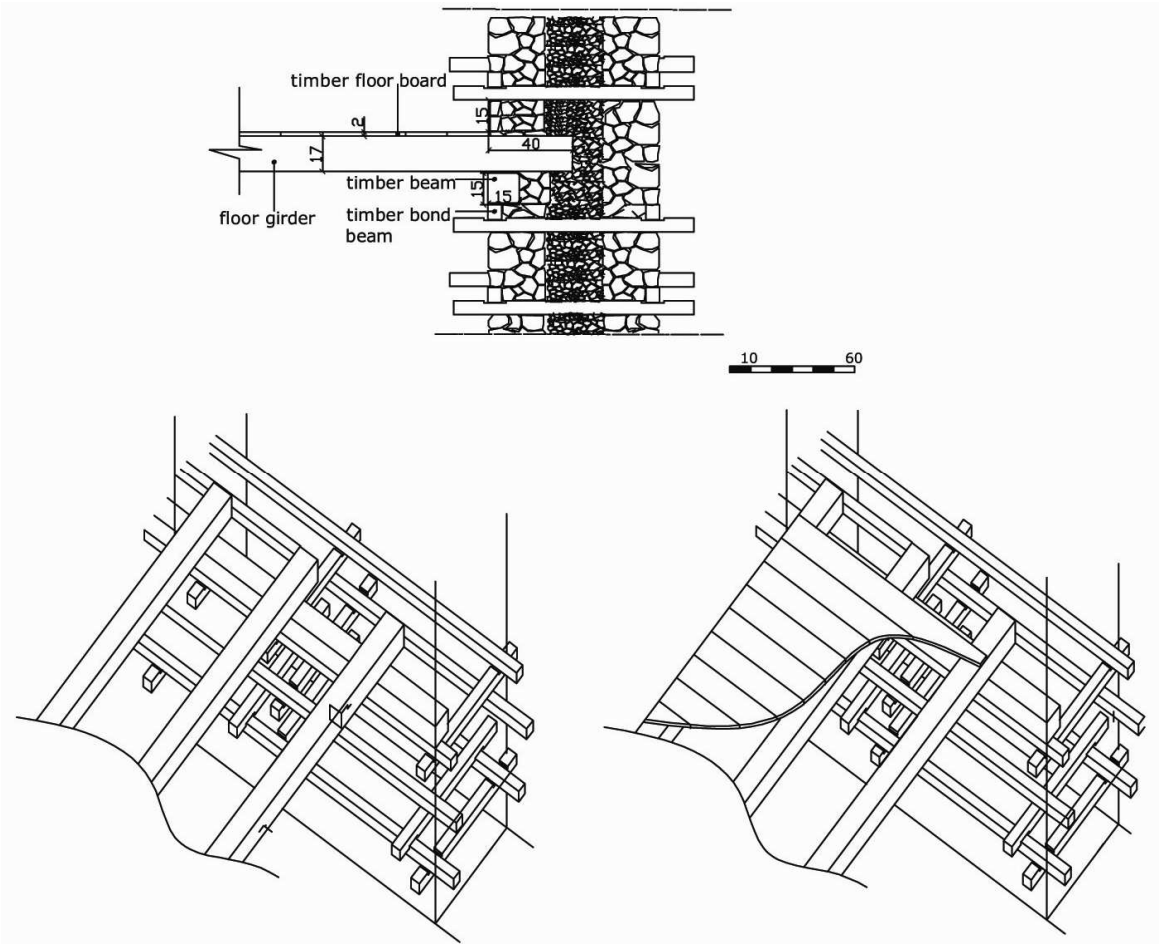
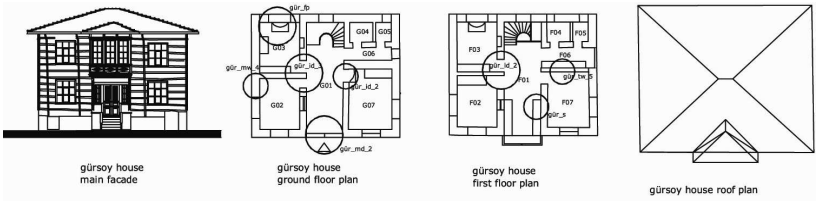


Figure 96 Record card of the detail of the floor of the Gürsoy House. Çelik, 2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜRSOY HOUSE Adress: Ormana
	Code: gür_fc_2

DETAIL OF THE CEILING



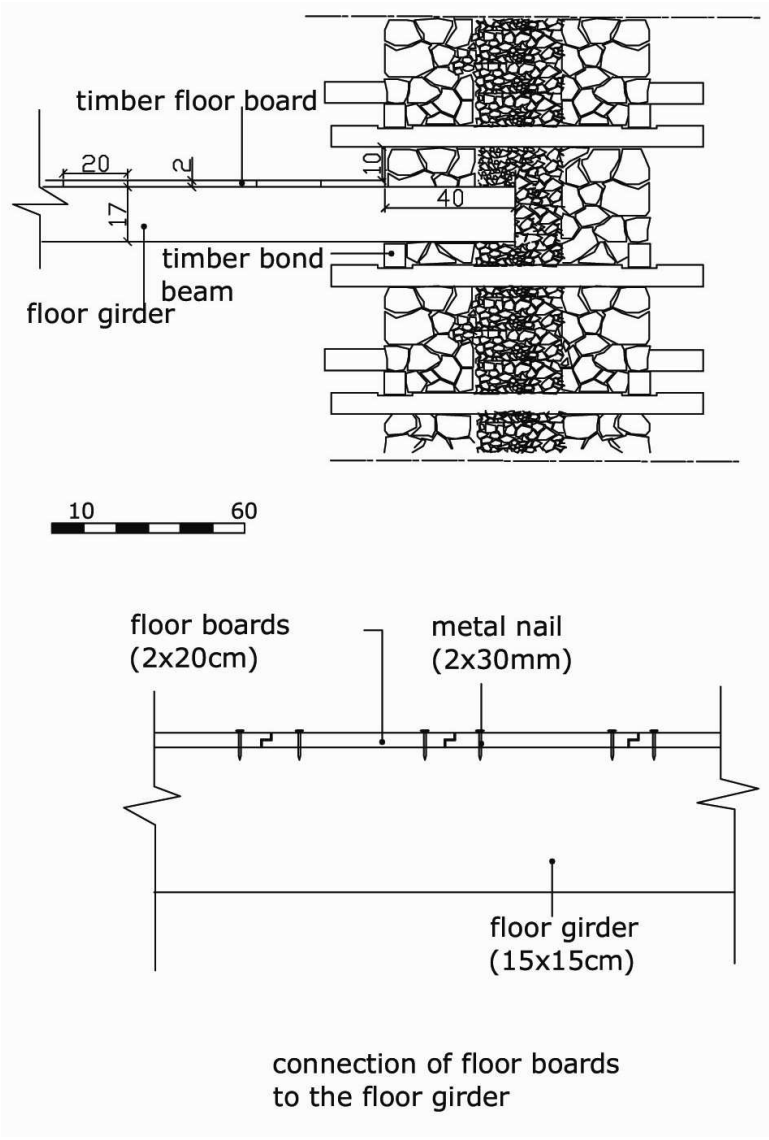


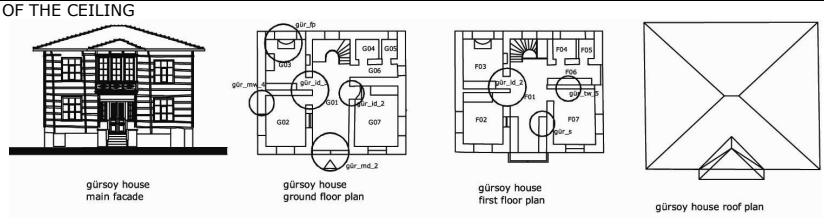
Figure 97 Record card of the ceiling of the Gürsoy House. Çelik, 2008

Figure 98 View from ceiling of the Gürsoy House. Çelik, 2008

Figure 99 View from the Gürsoy House. Çelik, 2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜRSOY HOUSE Adress: Ormana
	Code: gür_c_2

DETAIL OF THE CEILING



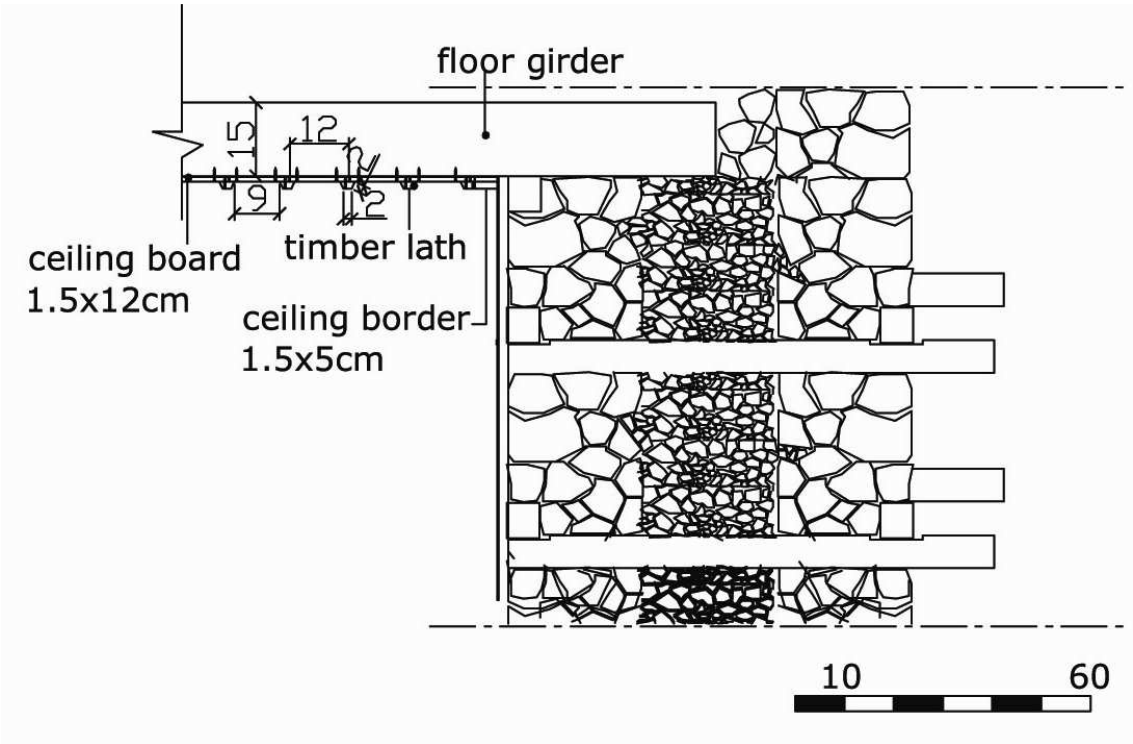
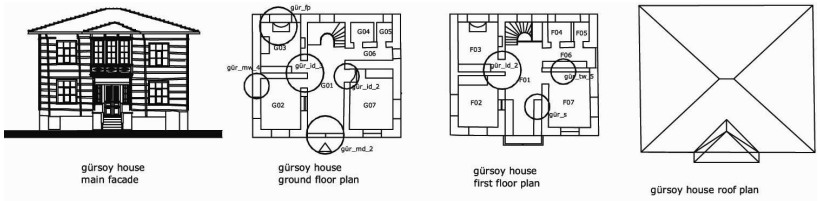


Figure 100 Record card of the ceiling of the Gürsoy House. Çelik, 2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜRSOY HOUSE Adress: Ormana
	Code: gür_md_2

DETAIL OF THE DOOR



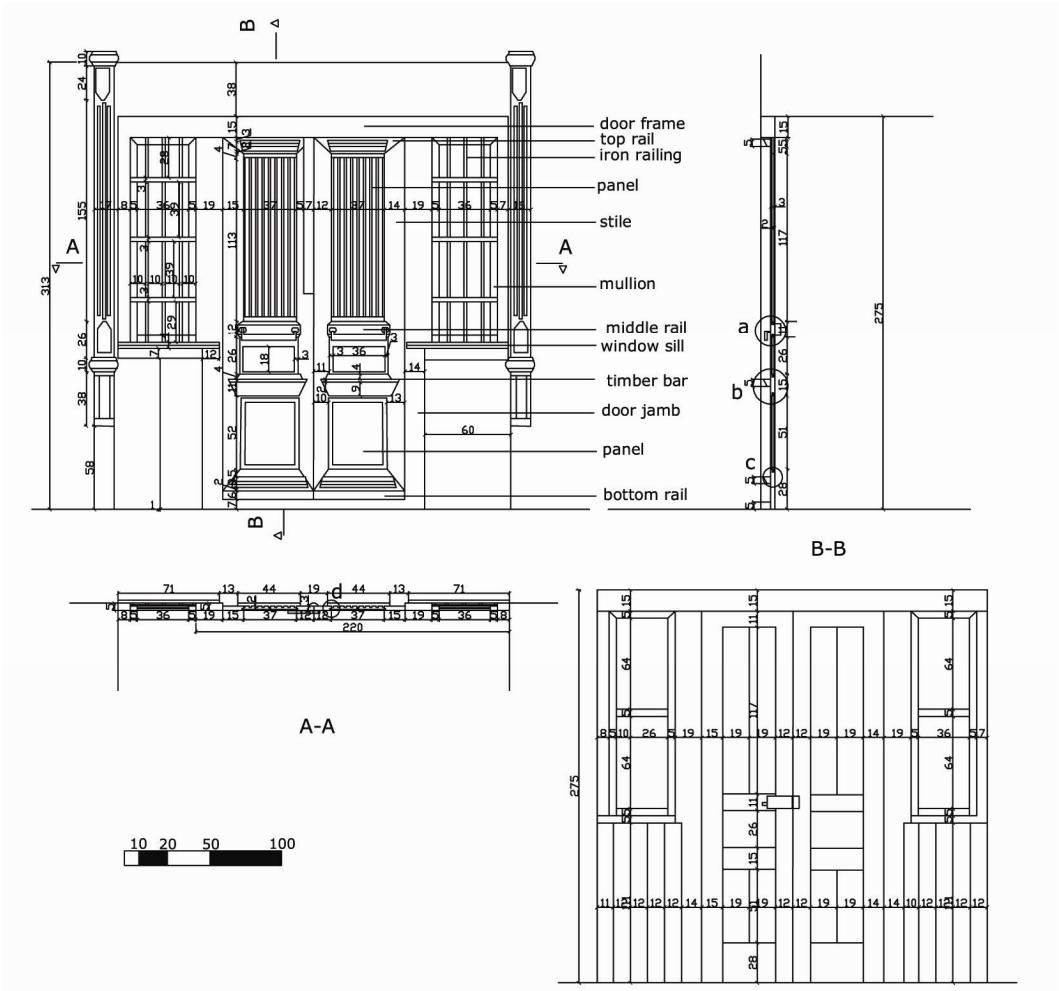


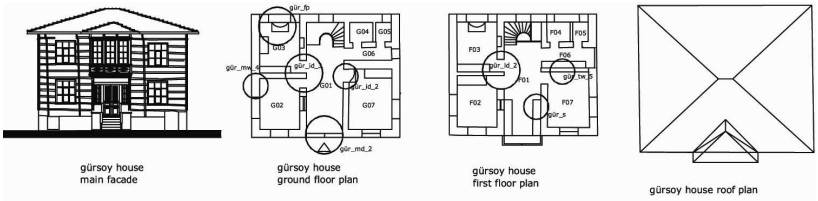
Figure 101 Record card of the main door of the Gürsoy House. Çelik, 2008.

Figure 102 View from the main door of the Gürsoy House. Çelik, 2008.

Figure 103 View from the main door of the Gürsoy House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜRSOY HOUSE Adress: Ormana
	Code: gür_md_2

DETAIL OF MAIN DOOR



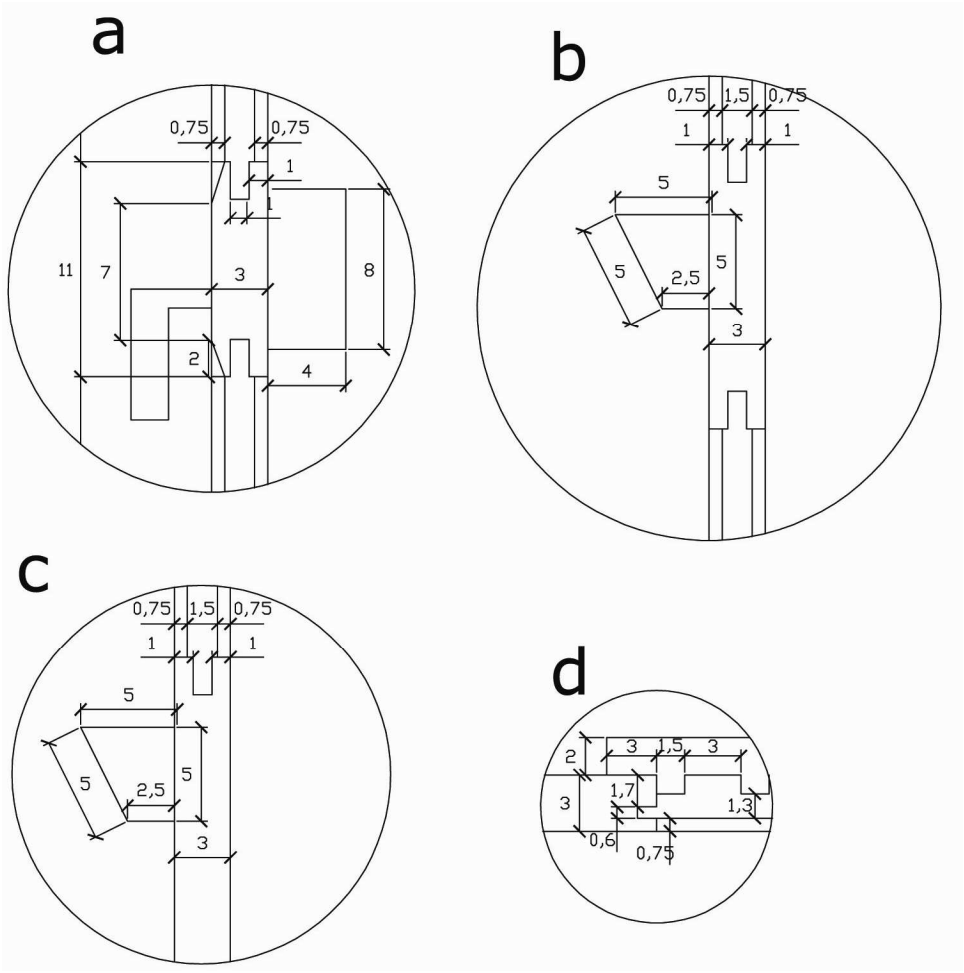
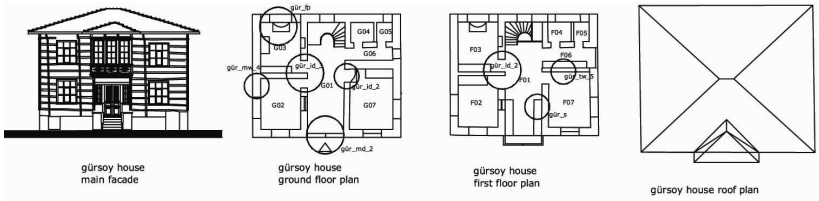


Figure 104 Record card of the main door of the Gürsoy House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜRSOY HOUSE Adress: Ormana
	Code: gür_id_3

DETAIL OF THE INTERIOR DOOR



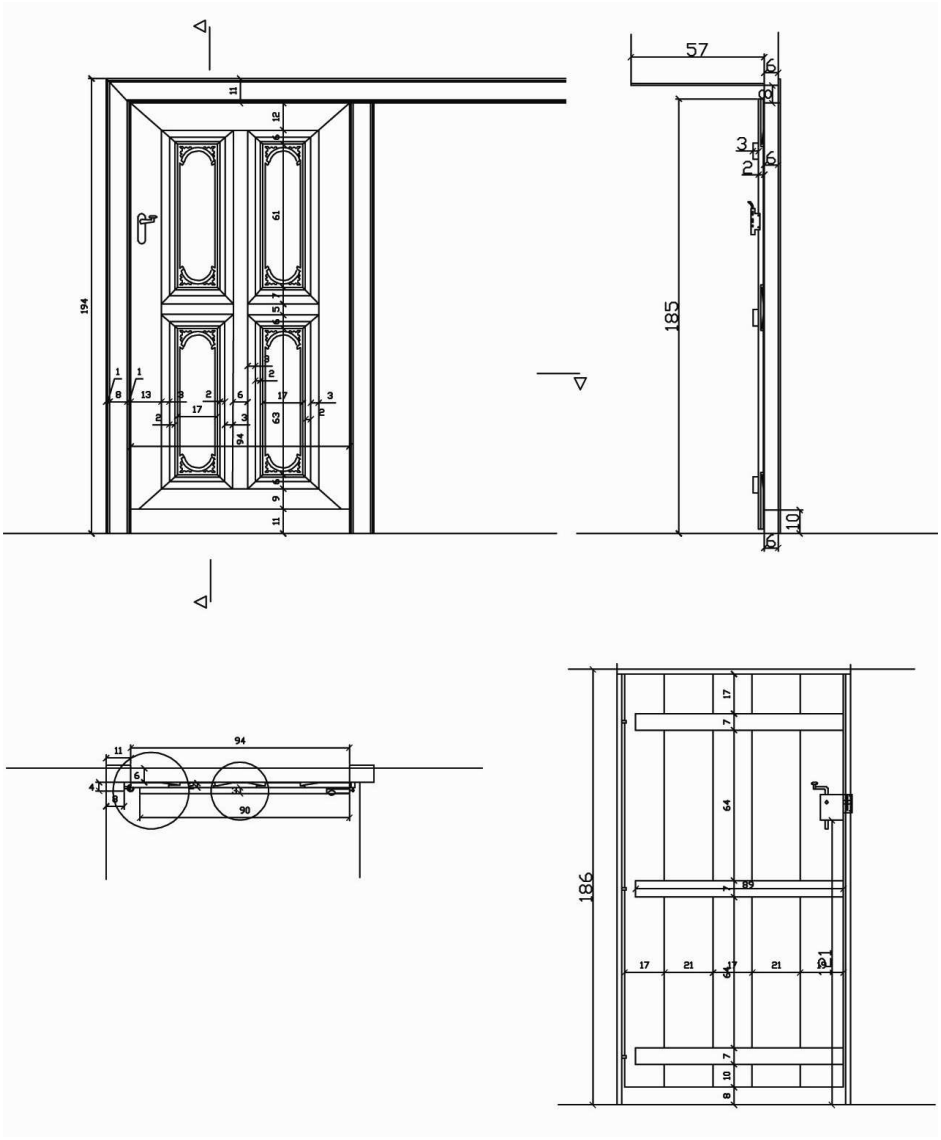
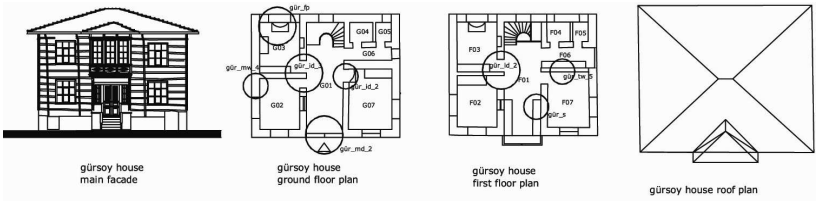


Figure 105 Record card of the interior door of the Gürsoy House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜRSOY HOUSE Adress: Palabıyık Çıkmazı , Number:4 , Ormana
	Code: gür_id_3

DETAIL OF INTERIOR DOOR



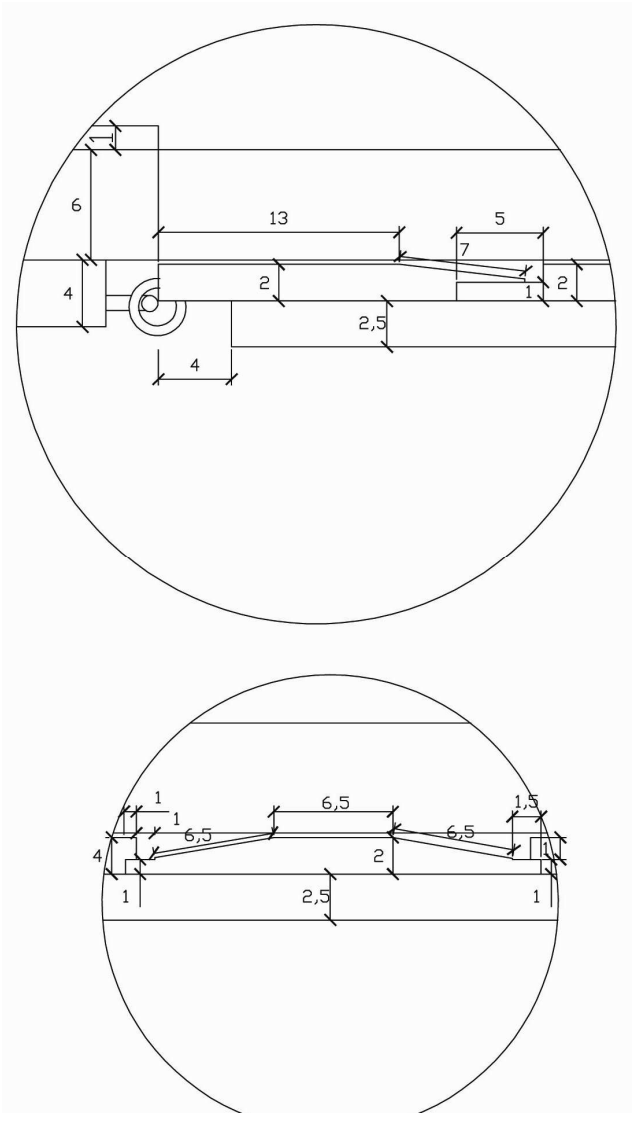
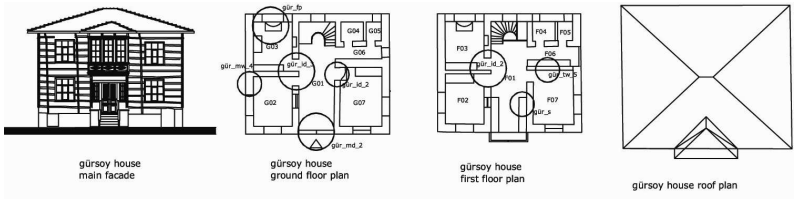


Figure 106 Record card of the interior door of the Gürsoy House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜRSOY HOUSE Adress:, Ormana
	Code: gür_id_3

DETAIL OF THE INTERIOR DOOR



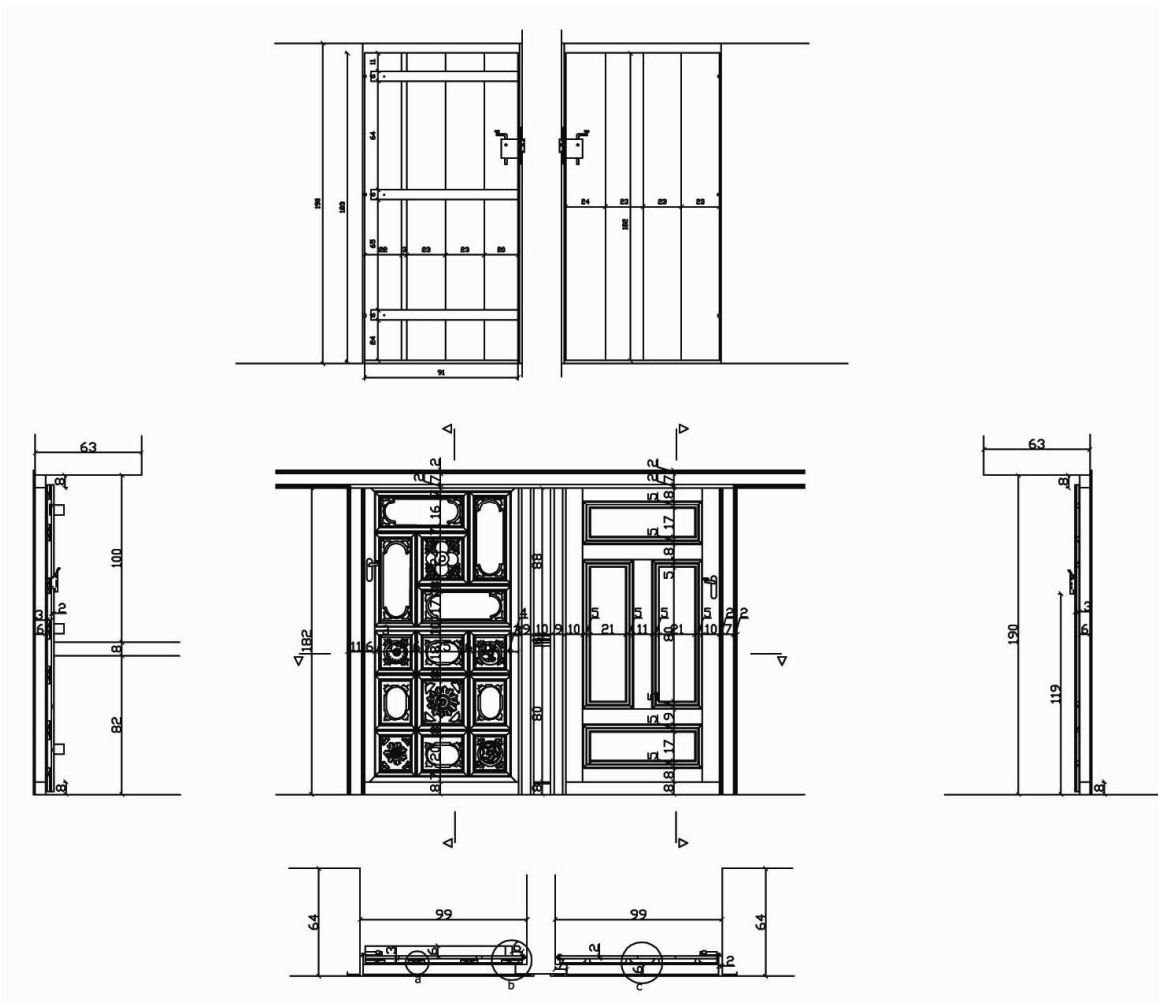
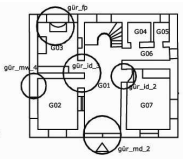


Figure 107 Record card of the interior door of the Gürsoy House. Çelik, 2008.

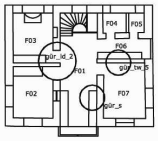
METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜRSOY HOUSE Adress: Ormana
	Code: gür_id_3

DETAIL OF THE INTERIOR DOOR

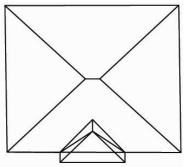
gürsoy house
main facade



gürsoy house
ground floor plan



gürsoy house
first floor plan



gürsoy house roof plan

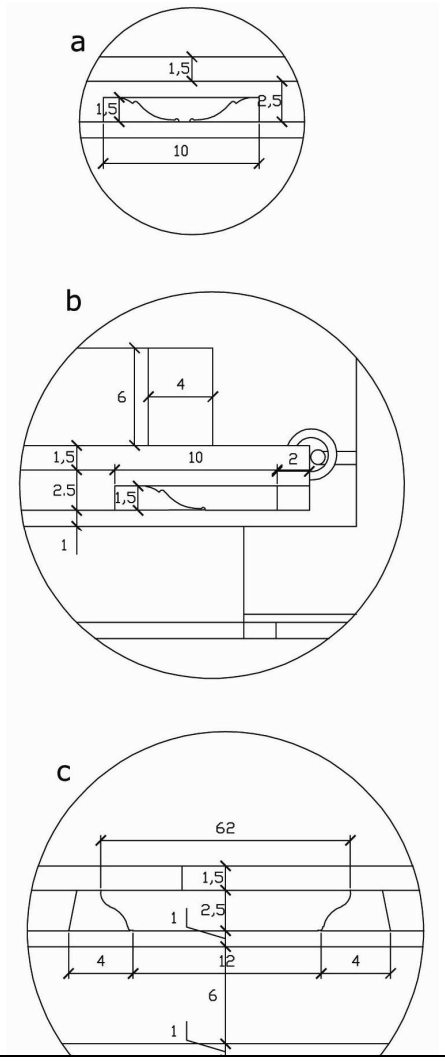
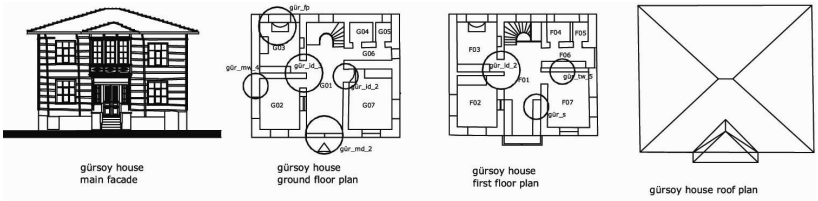


Figure 108 Record card of the interior door of the Gürsoy House. Çelik, 2008.

Figure 109 View from the interior door of the Gürsoy House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜRSOY HOUSE Adress: Ormana
	Code: gür_id_2

DETAIL OF THE INTERIOR DOOR



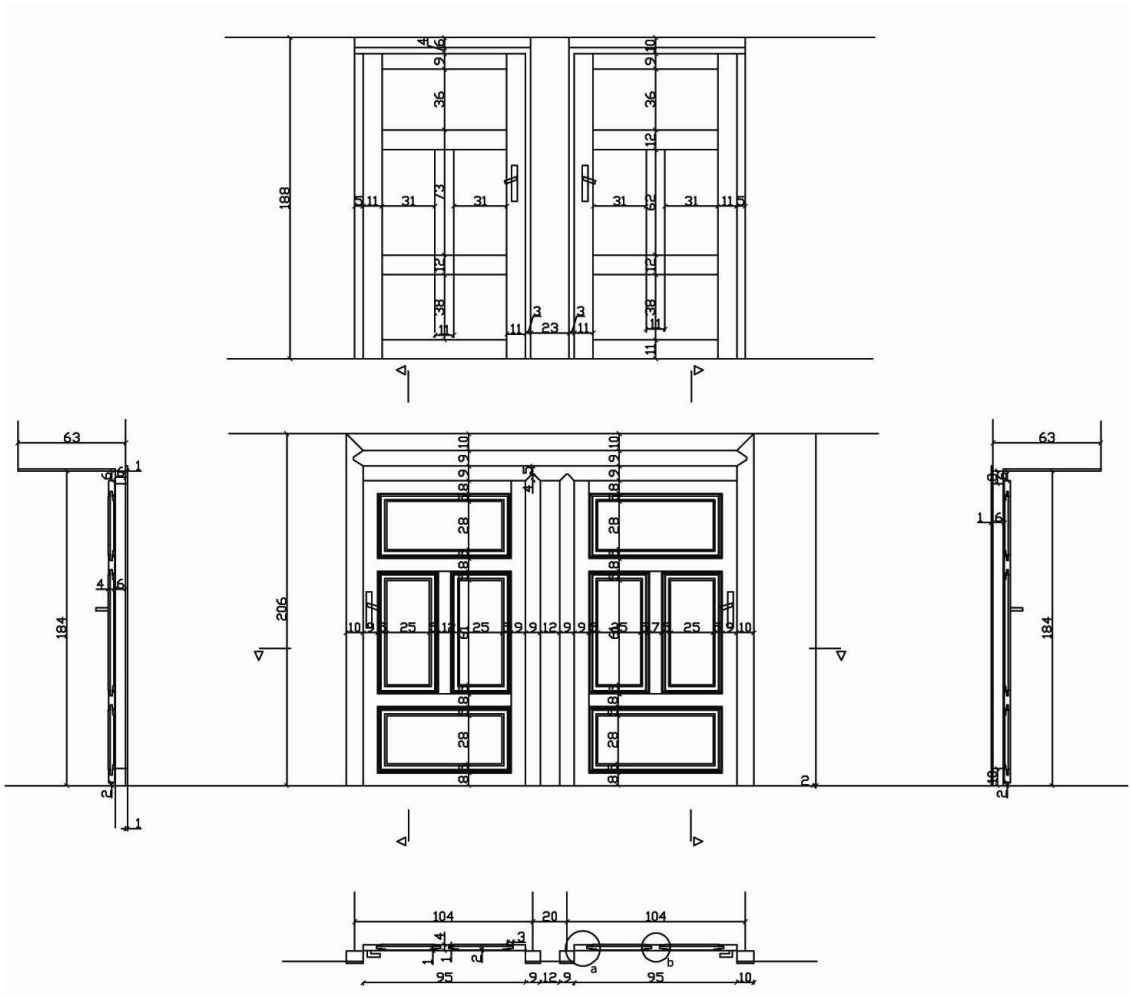
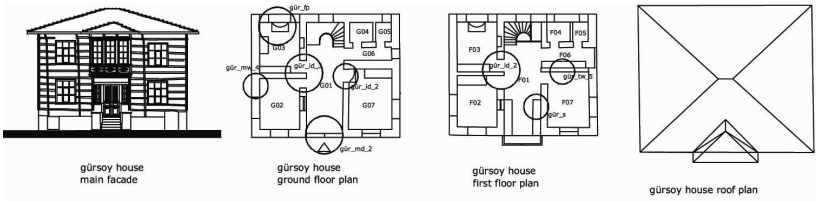


Figure 110 Record card of the interior door of the Gürsoy House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: GÜRSOY HOUSE Adress: Ormana
	Code: gür_id_2

DETAIL OF THE INTERIOR DOOR



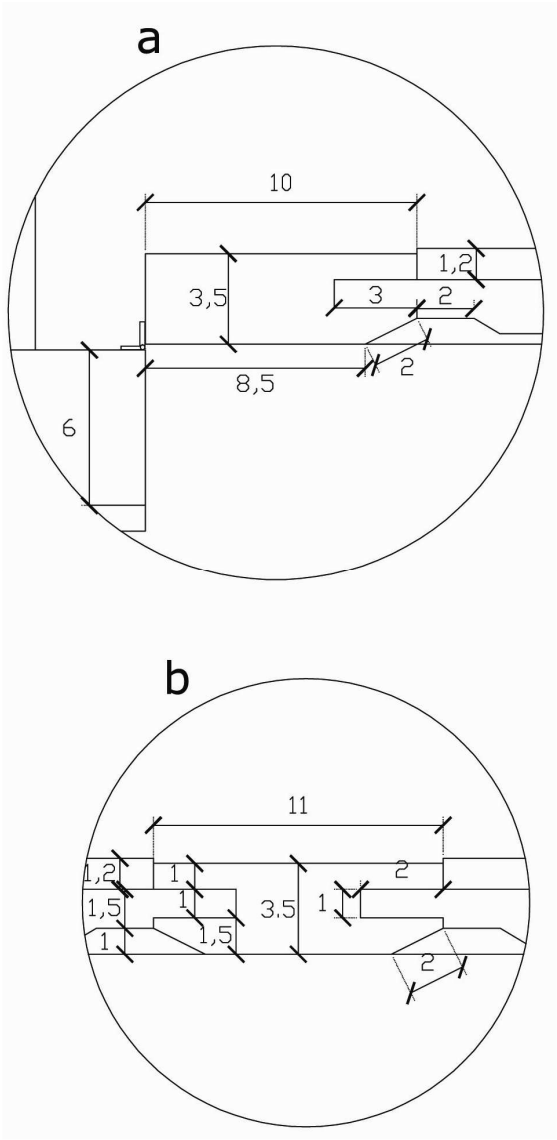


Figure 111 Record card of the interior door of the Gürsoy House. Çelik, 2008.

Figure 112 View from the interior door of the Gürsoy House. Çelik, 2008.

APPENDIX C

DRAWINGS AND FIGURES RELATED TO THE MUNICIPALITYS GUEST HOUSE

Figure 113 The drawing of the main façade of Municipality's Guest House.Çelik, 2008.

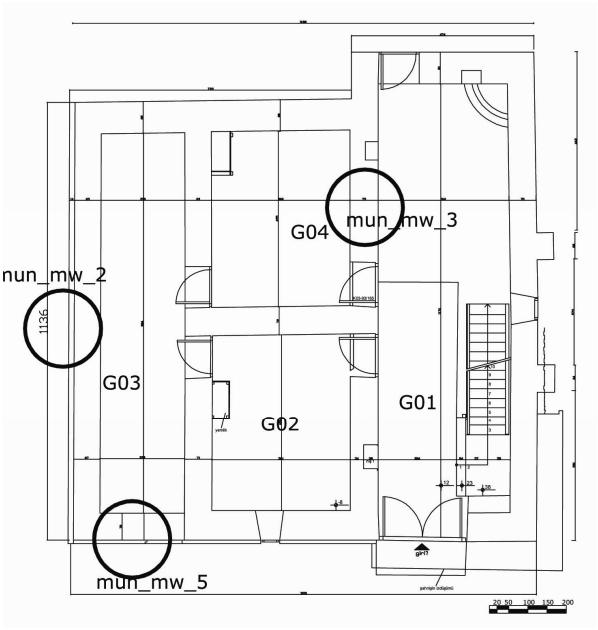


Figure 114 Plan of the ground floor of Municipality's Guest House.Çelik, 2008.

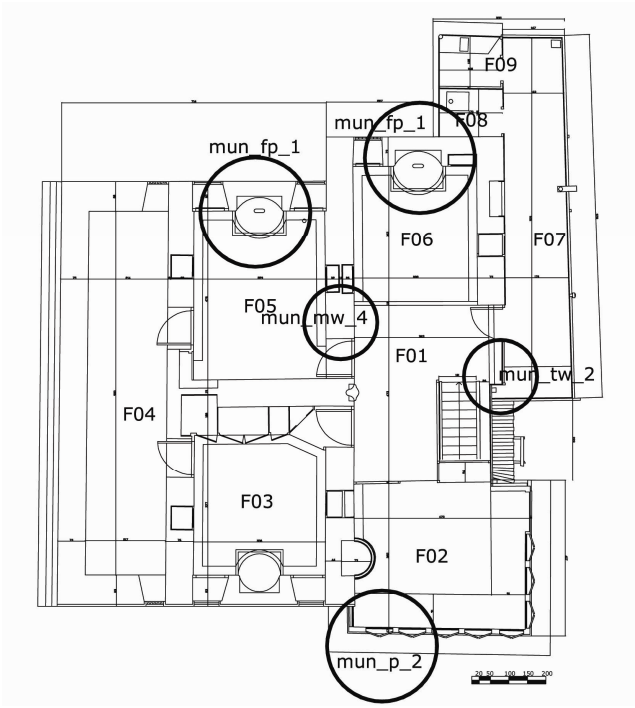


Figure 115 The plan of the first floor of Municipality's Guest House.Çelik, 2008.

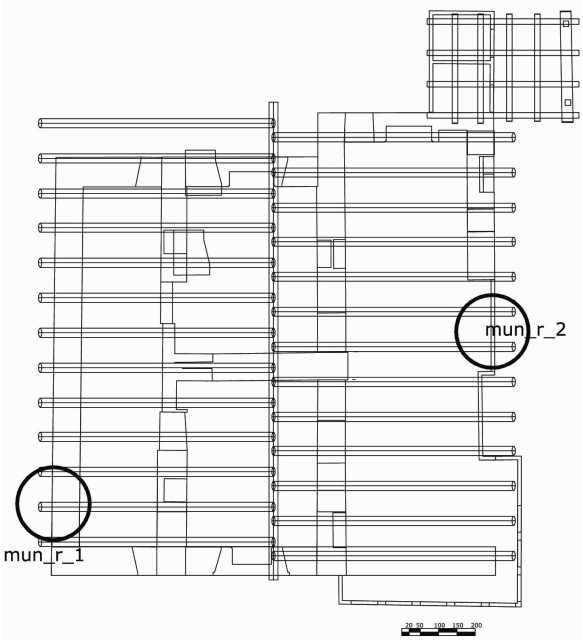
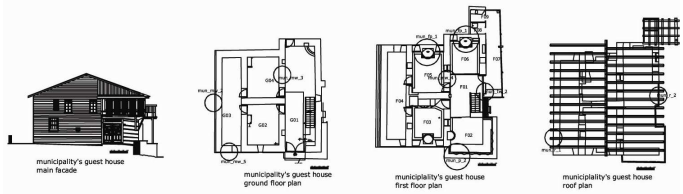


Figure 116 Roof plan of Municipality's Guest House.Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: MUNICIPALITY'S GUEST HOUSE Adress:
	Code: mun_mw_1

DETAIL OF THE DOOR



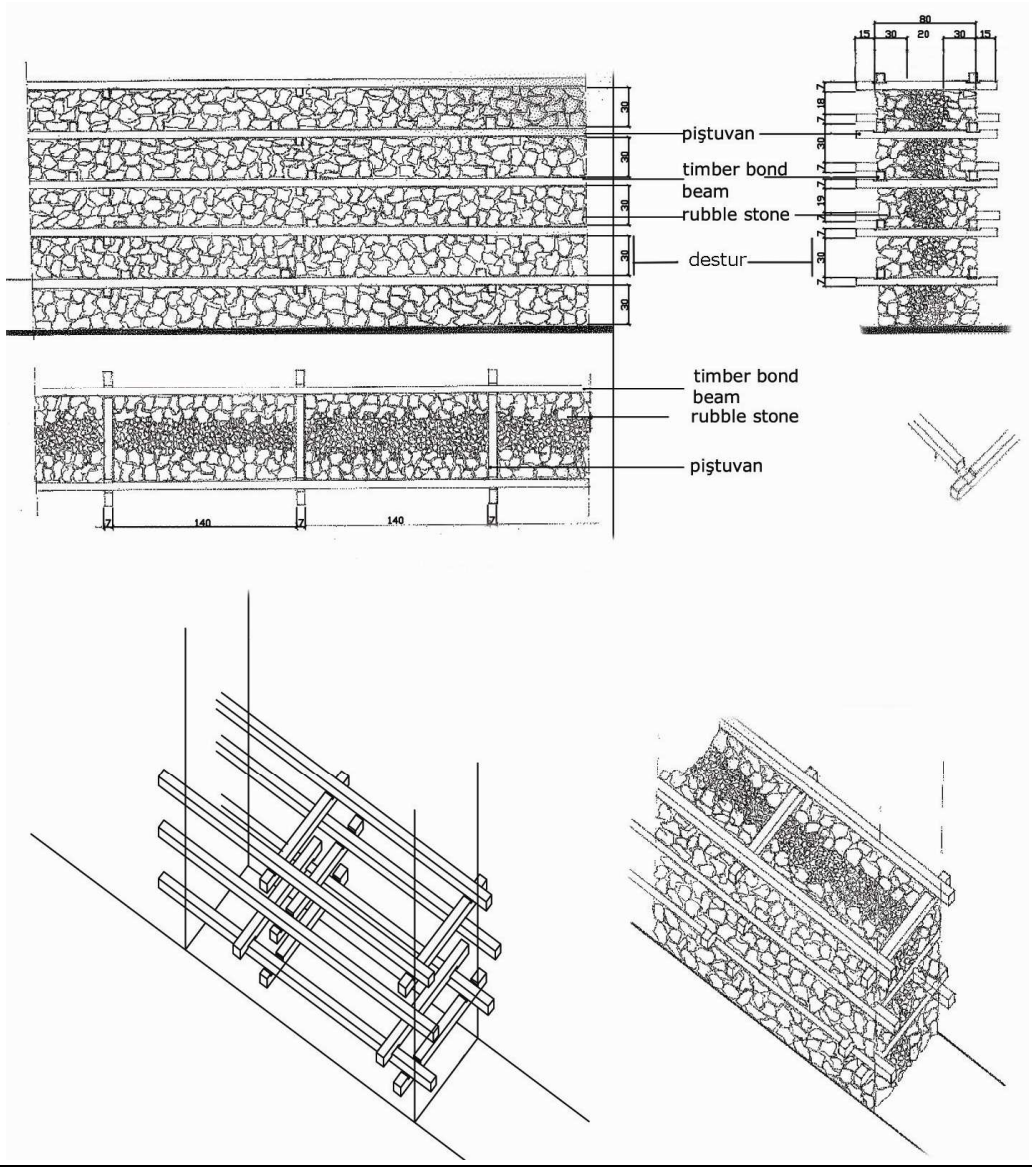
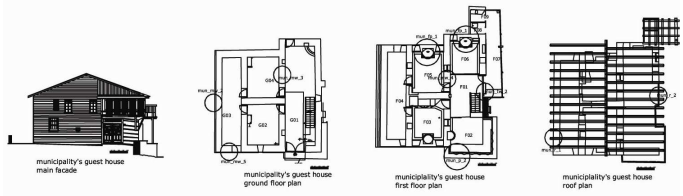


Figure 117 Record card of the detail of the wall of the Municipality's Guest House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: MUNICIPALITY'S GUEST HOUSE Adress:
	Code: mun_mw_2

DETAIL OF THE DOOR



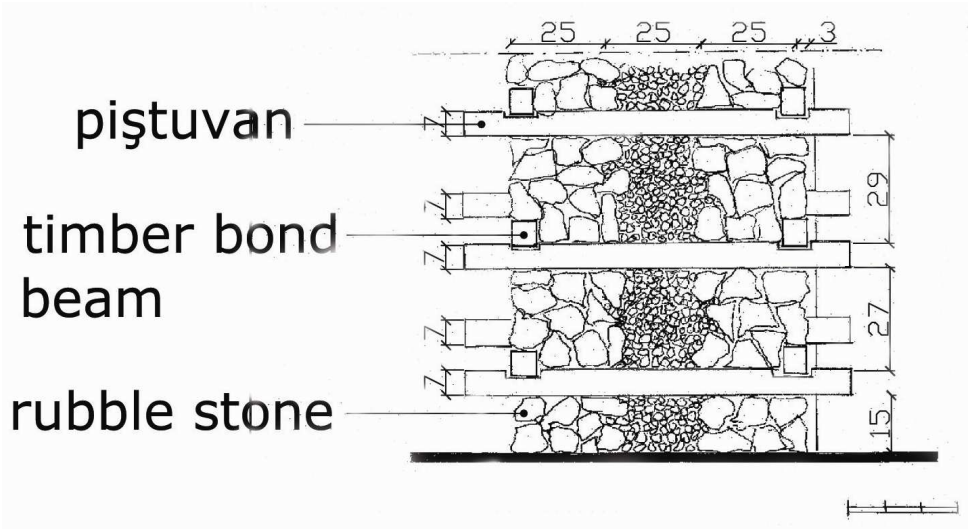


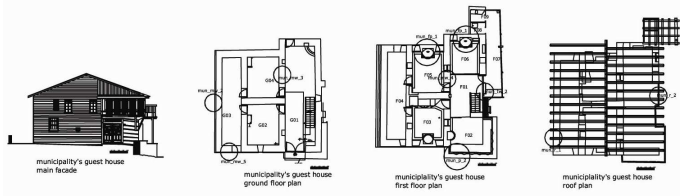
Figure 118 Record card of the detail of the wall of the Municipality's Guest House. Çelik, 2008.

Figure 119 View from the wall of Municiplity's Guest House. Çelik, 2008.

Figure 120 View from the wall of Municiplity's Guest House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: MUNICIPALITY'S GUEST HOUSE Adress:
	Code: mun_mw_3

DETAIL OF THE DOOR



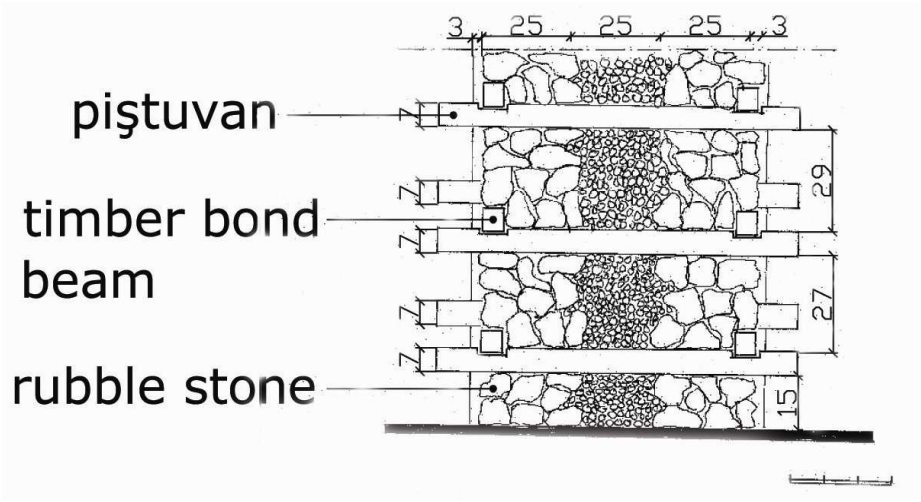
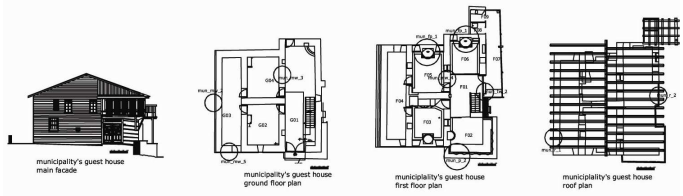


Figure 121 Record card of the detail of the wall of the Municipality's Guest House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: MUNICIPALITY'S GUEST HOUSE Adress:
	Code: mun_mw_5

DETAIL OF THE



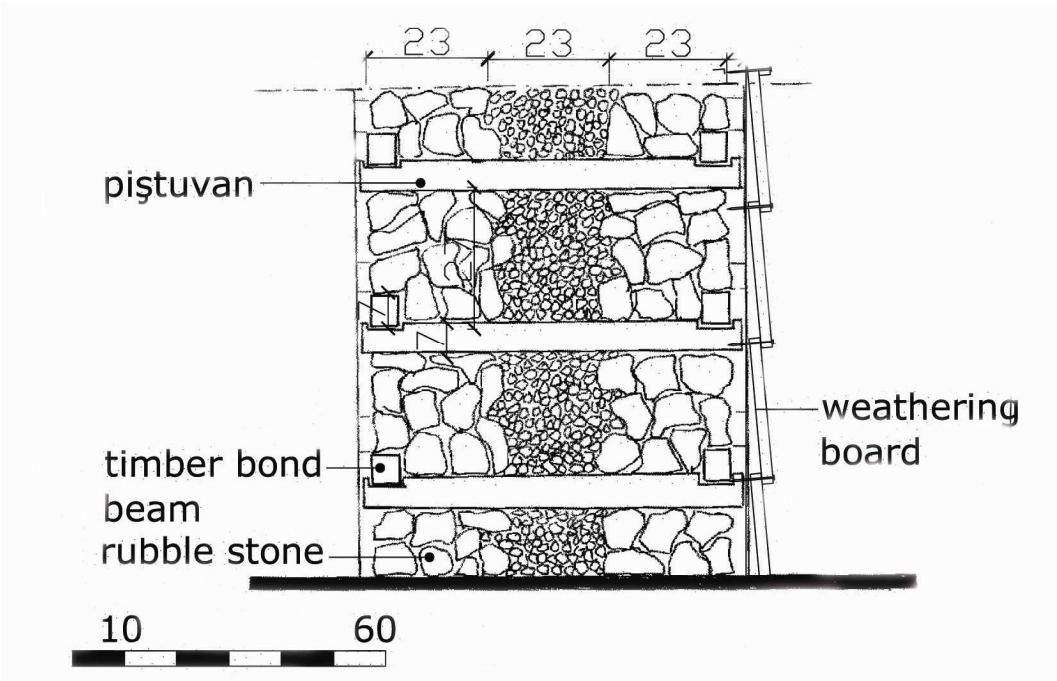
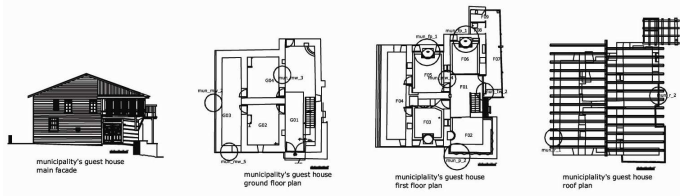


Figure 122 Record card of the detail of the wall of the Municipality's Guest House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: MUNICIPALITY'S GUEST HOUSE Adress:
	Code: mun_mw_4

DETAIL OF THE WALL



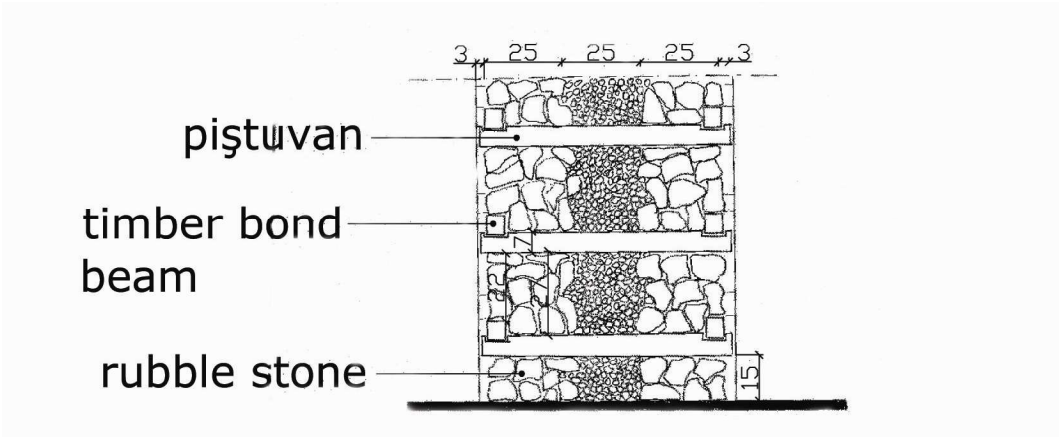
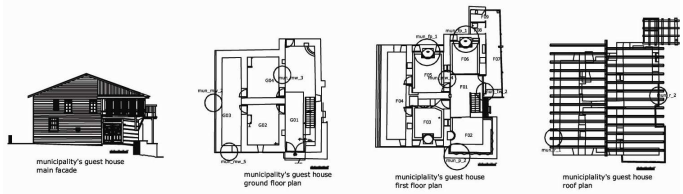


Figure 123 Record card of the detail of the wall of the Municipality's Guest House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: MUNICIPALITY'S GUEST HOUSE Adress:
	Code: mun_cmw

DETAIL OF THE CONNECTION OF THE WALL



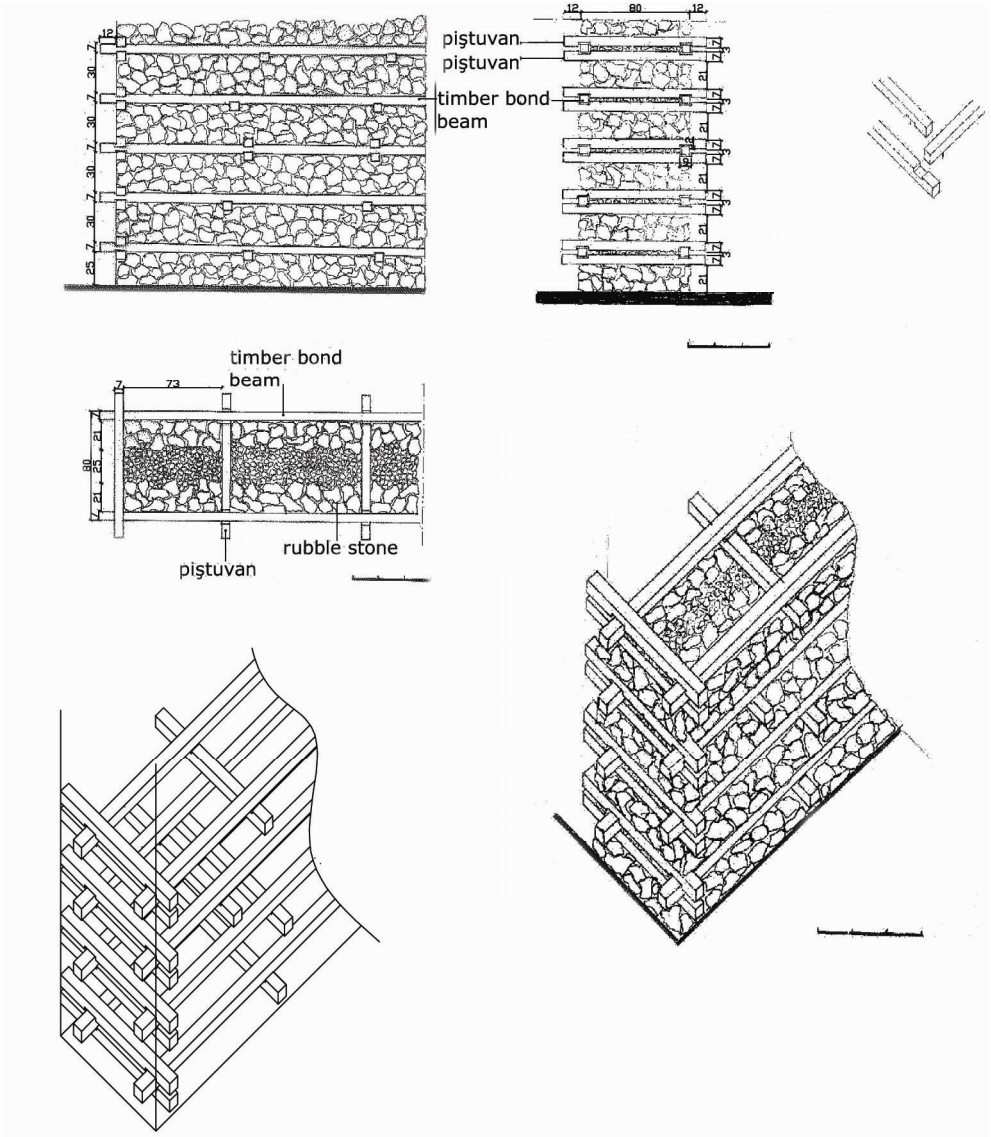
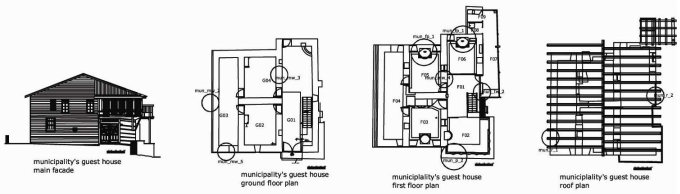


Figure 124 Record card of the detail of the connection of the wall of the Municipality's Guest House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: MUNICIPALITY'S GUEST Adress:
	Code: mun_tw_1

DETAIL OF THE TIMBER WALL



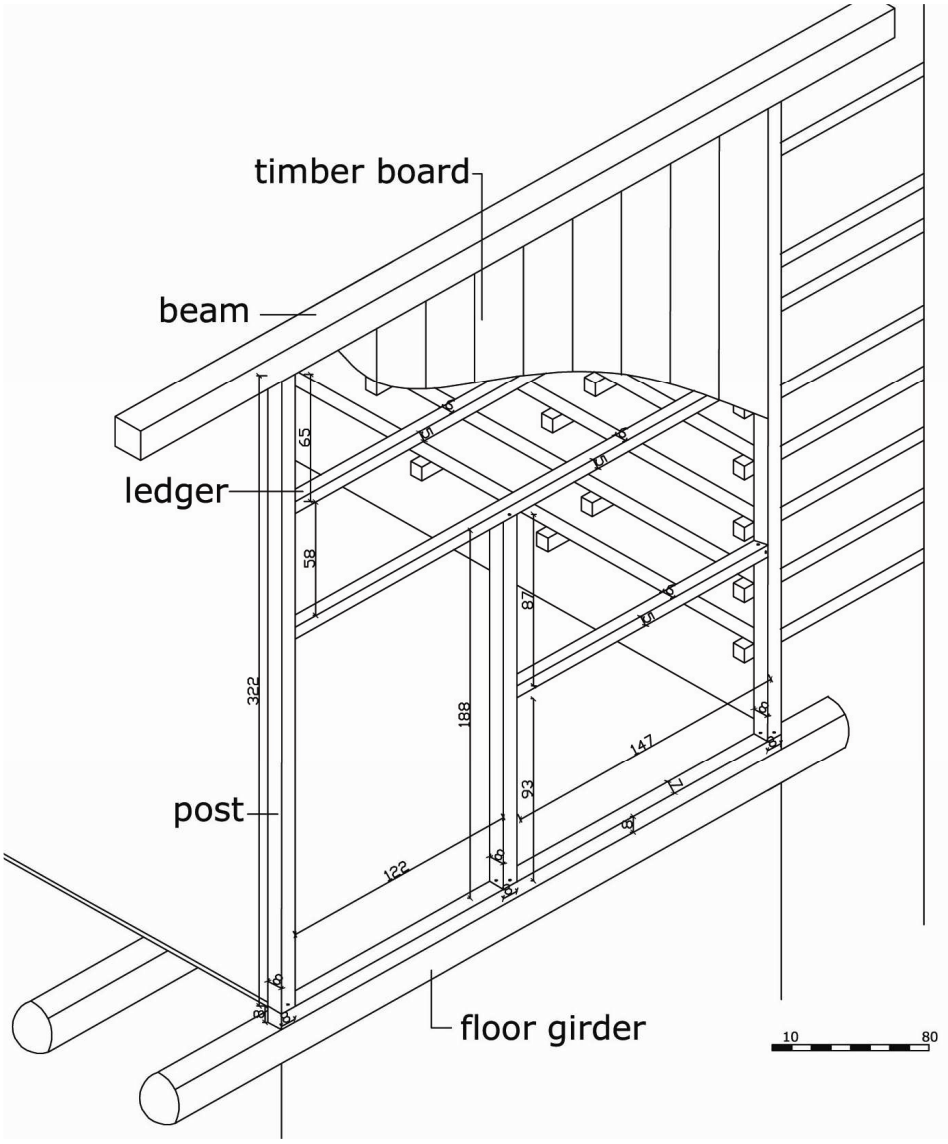
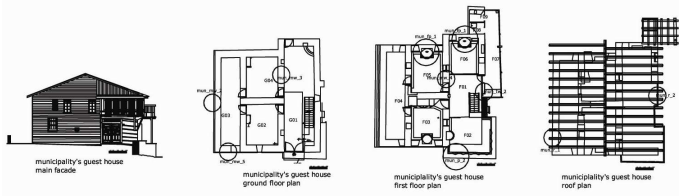


Figure 125 Record card of the detail of the timber wall of the Municipality's Guest House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: MUNICIPALITY'S GUEST HOUSE Adress:
	Code: mun_fc_e

DETAIL OF THE FLOOR



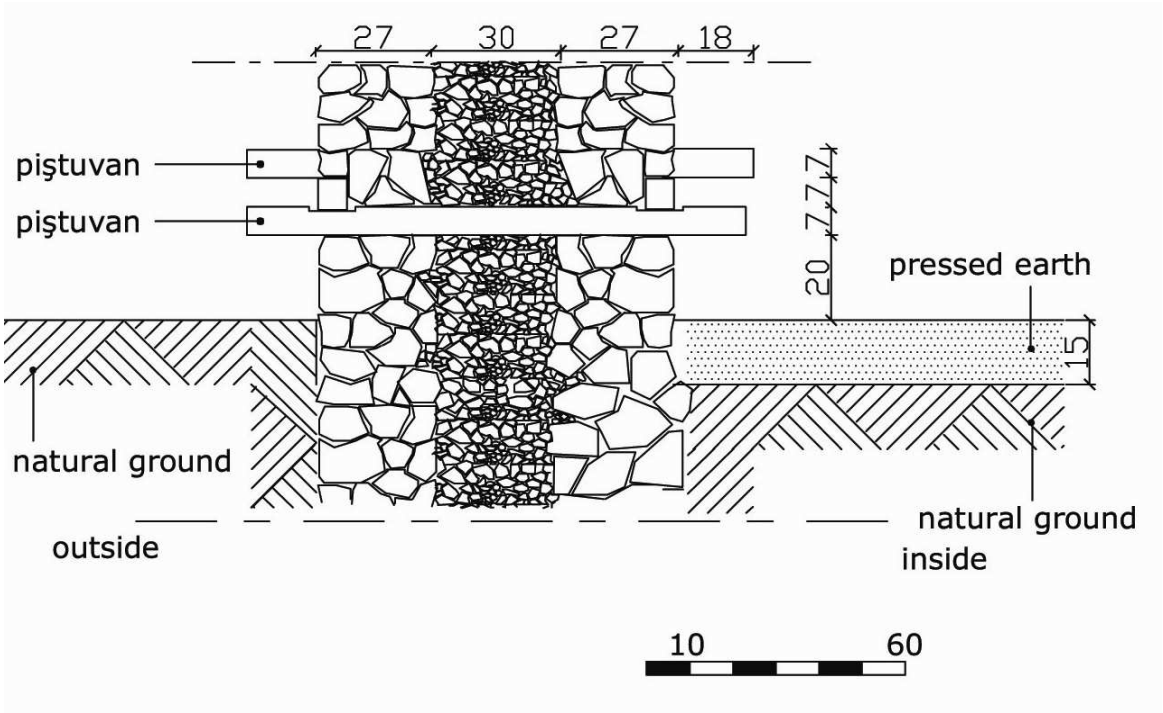
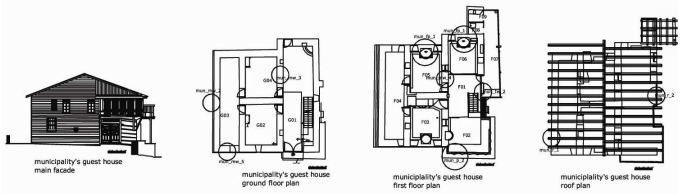


Figure 126 Figure 124 Record card of the detail of the earth floor of the Municipality's Guest House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: MUNICIPALITY'S GUEST HOUSE Adress:
	Code: mun_fc_1

DETAIL OF THE FLOOR



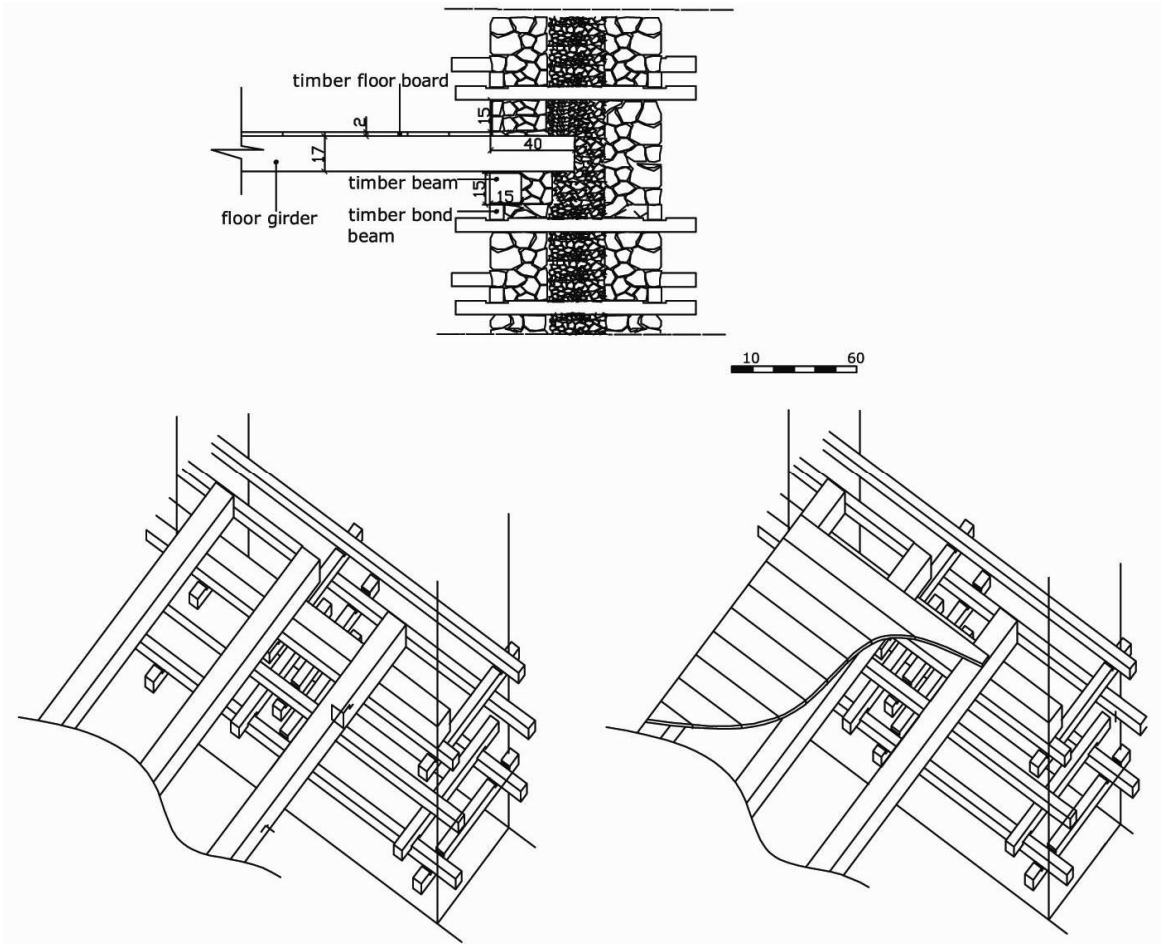
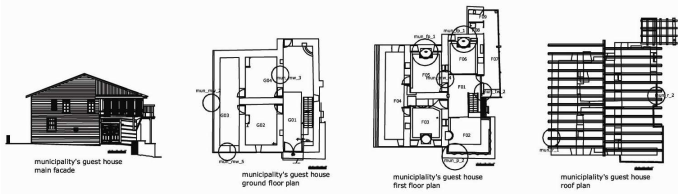


Figure 127 Figure 124 Record card of the detail of the floor of the Municipality's Guest House. Çelik, 2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: MUNICIPALITY'S GUEST HOUSE Adress:
	Code: mun_fc_2

DETAIL OF THE CEILING



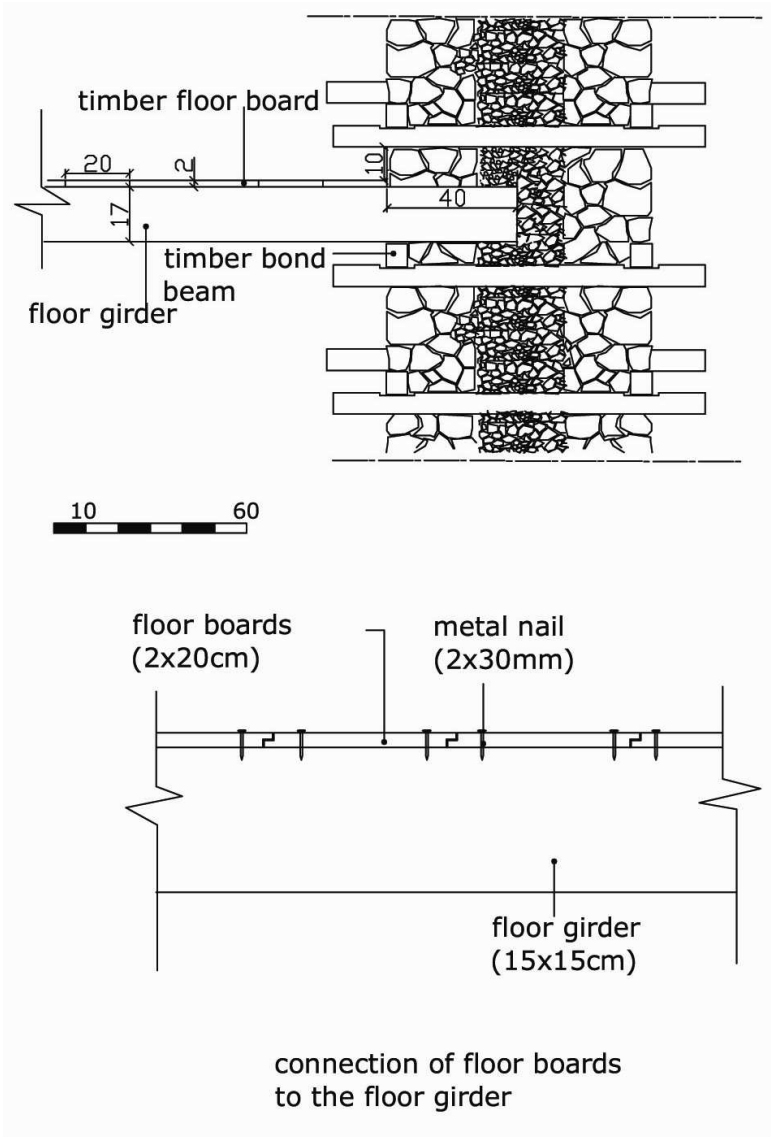


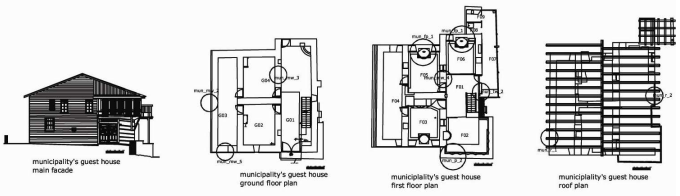
Figure 128 Record card of the detail of the ceiling of the Municipality's Guest House. Çelik, 2008

Figure 129 View from the floor. Çelik, 2008

Figure 130 View from the roof Municipality's Guest House. Çelik, 2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: MUNICIPALITY'S GUEST HOUSE
	Code: mun_c_2

DETAIL OF THE CEILING



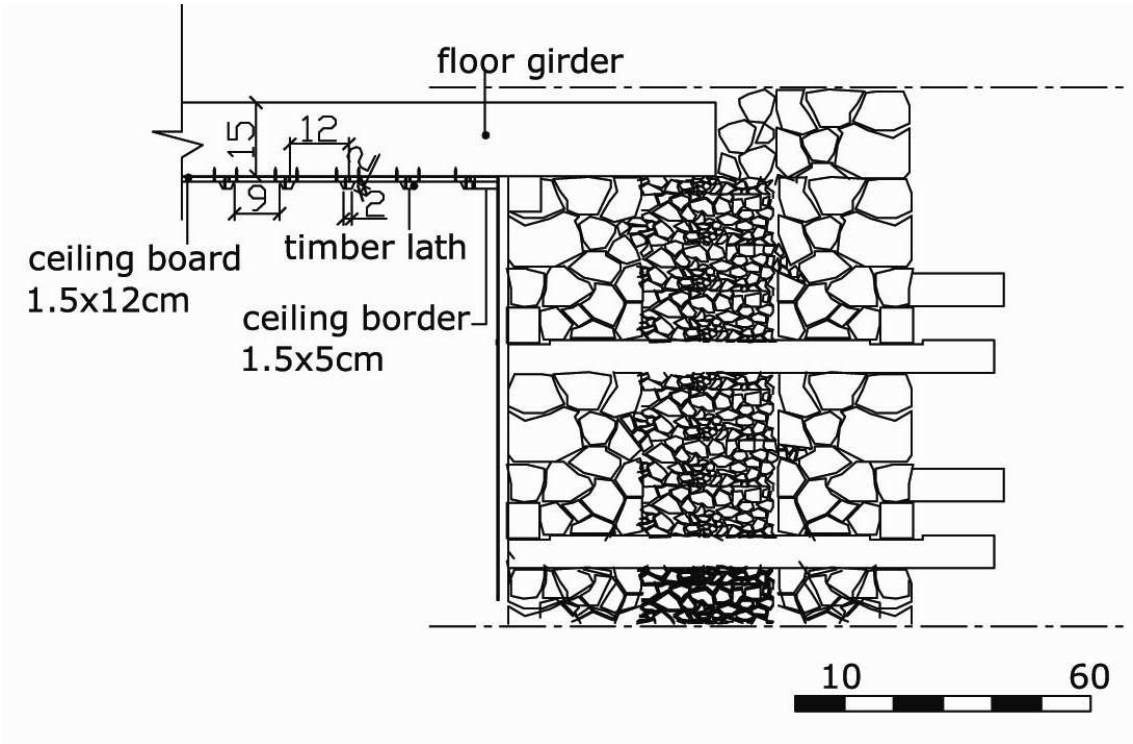
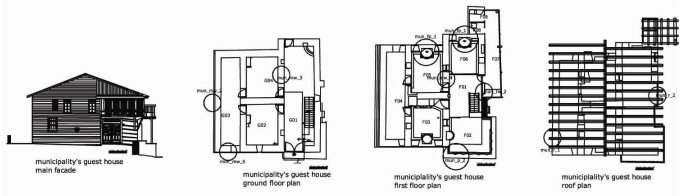


Figure 131 Record card of the detail of the ceiling of the Municipality's Guest House. Çelik, 2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: MUNICIPALITY'S GUEST HOUSE Adress:
	Code: mun_r_1

DETAIL OF THE ROOF



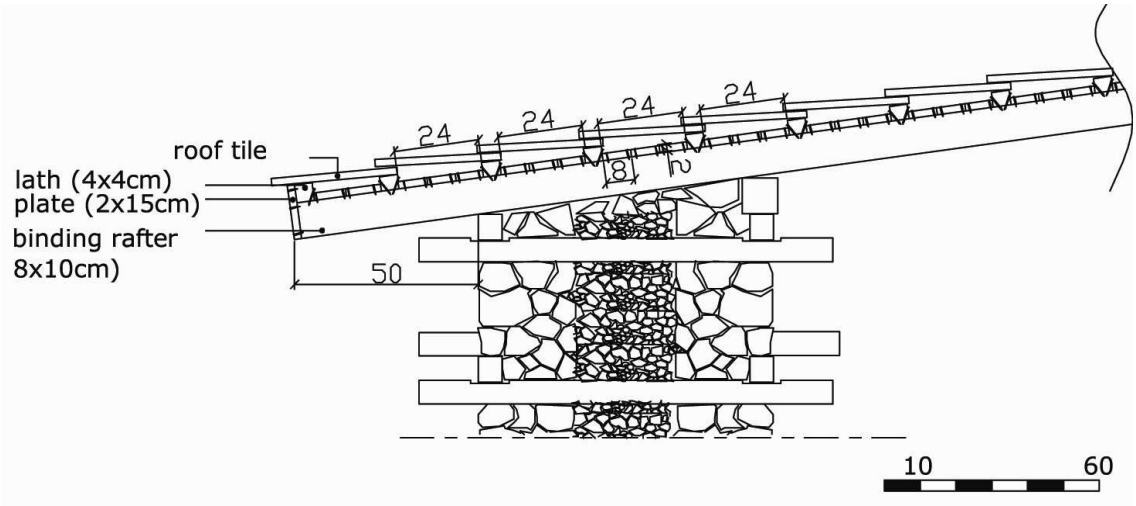
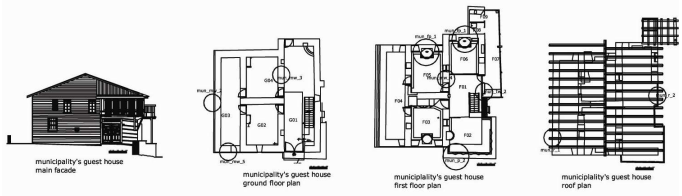


Figure 132Record card of the detail of the roof of the Municipality's Guest House. Çelik, 2008

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: MUNICIPALITY'S GUEST HOUSE Adress:
	Code: güm_r_2

DETAIL OF THE ROOF



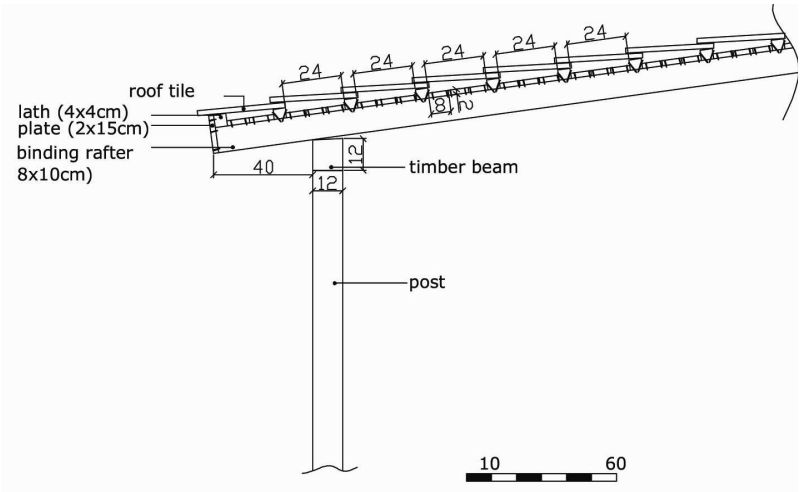


Figure 133 Record card of the detail of the roof of the Municipality's Guest House. Çelik, 2008

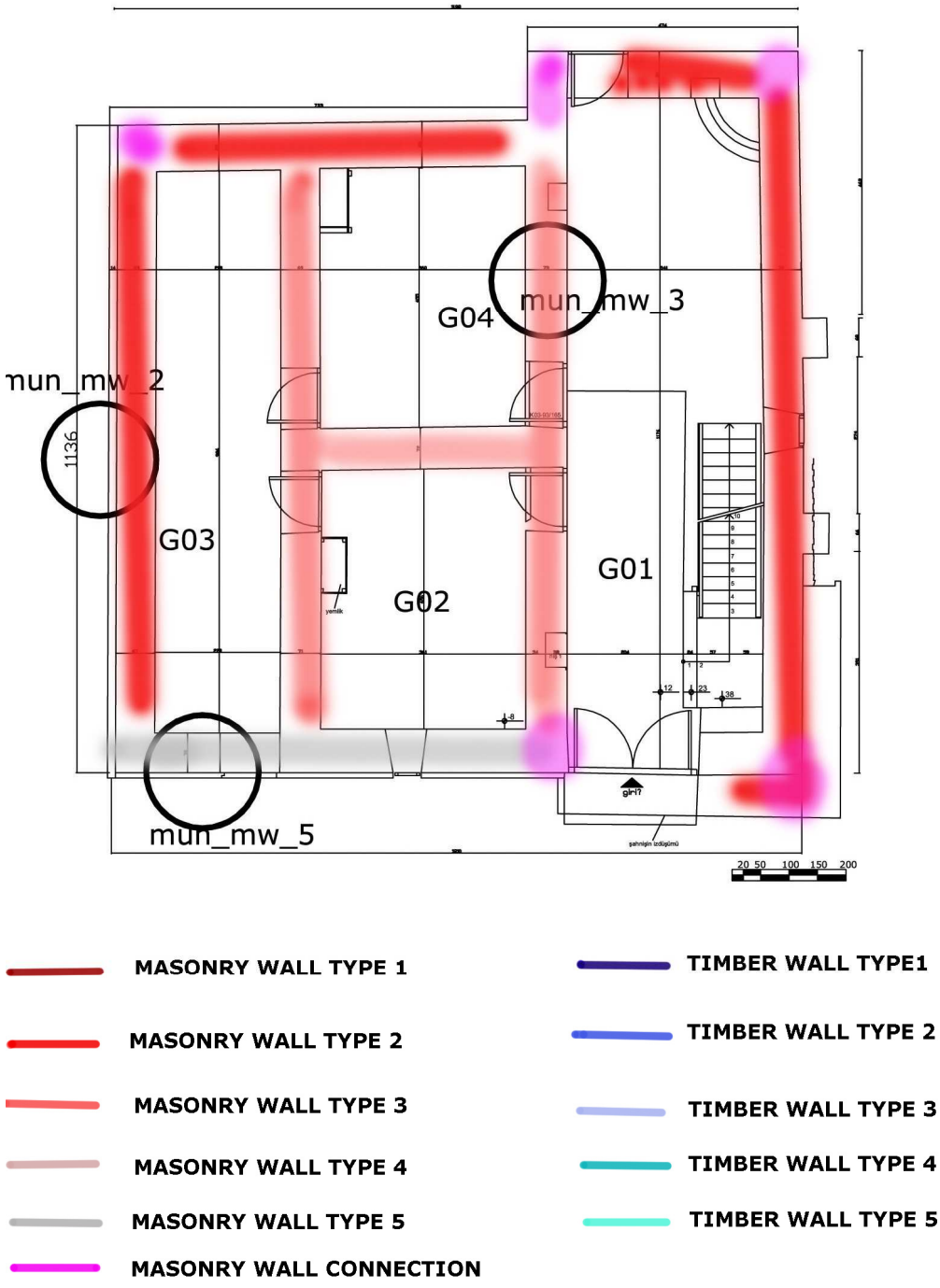


Figure 134 Distribution of the wall types of the Municipality's Guest House. Çelik, 2008

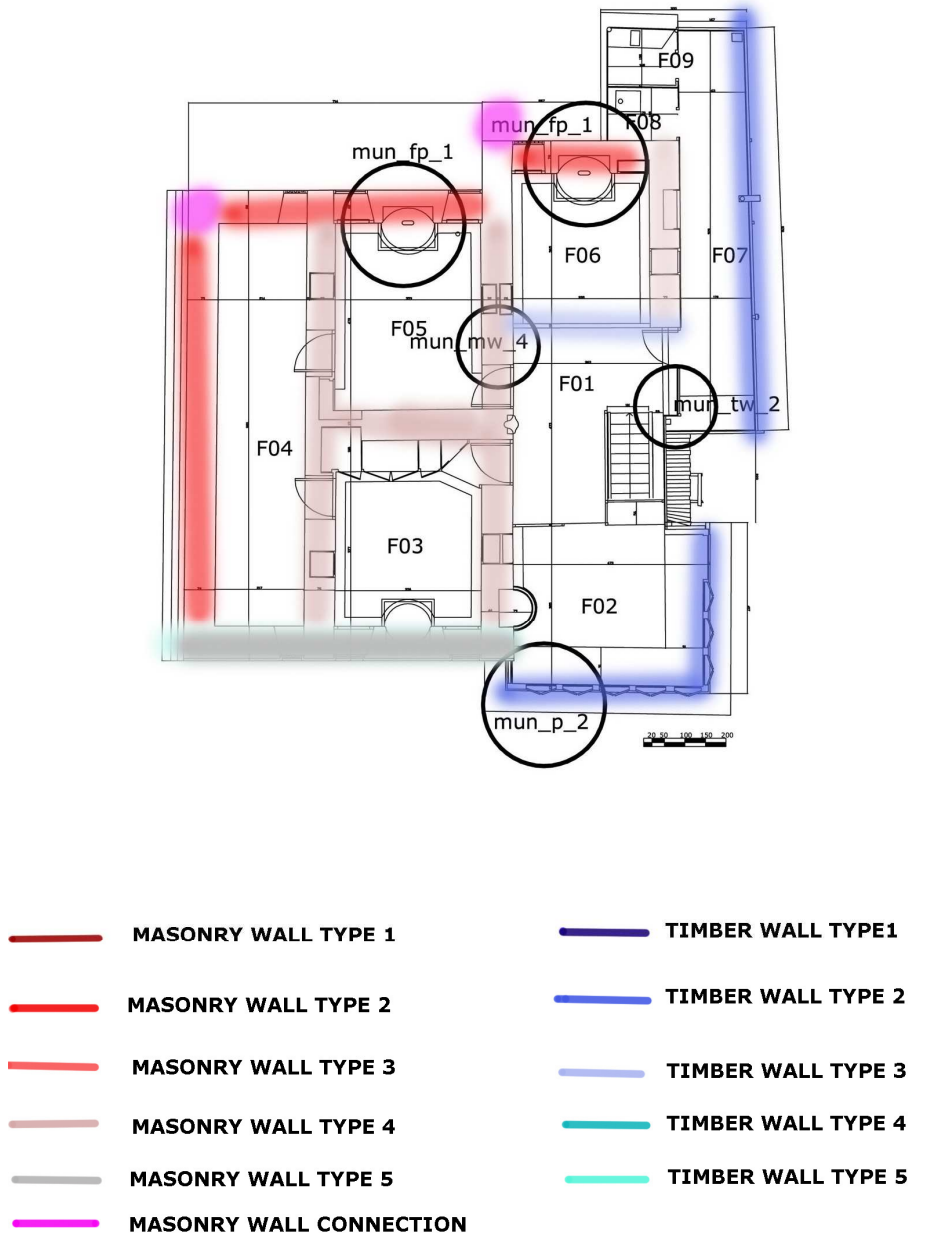


Figure 135 Distribution of the wall types of the Municipality's Guest House. Çelik, 2008

APPENDIX D

DRAWINGS AND FIGURES RELATED TO THE EYÜPOĞLU HOUSE

Figure 136 View from Eyüpoğlu House. Çelik, 2008.

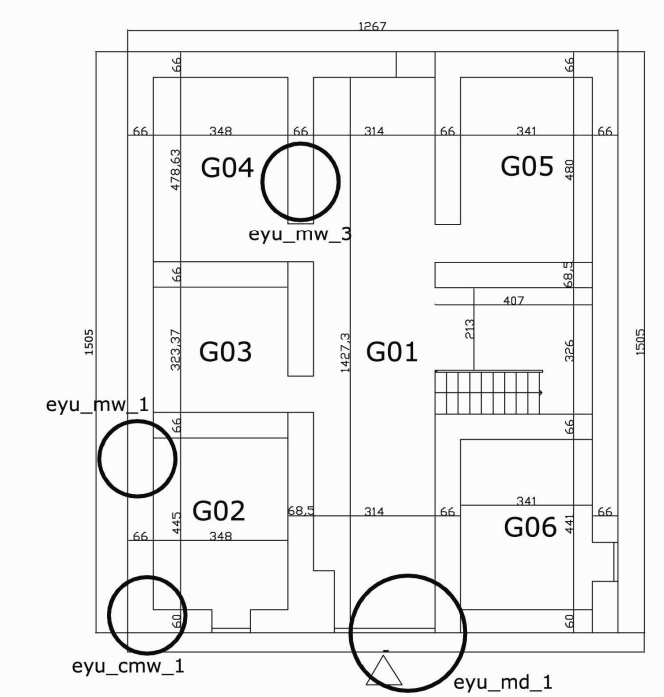


Figure 137 Ground floor plan of the Eyüpoğlu House. Çelik, 2008.

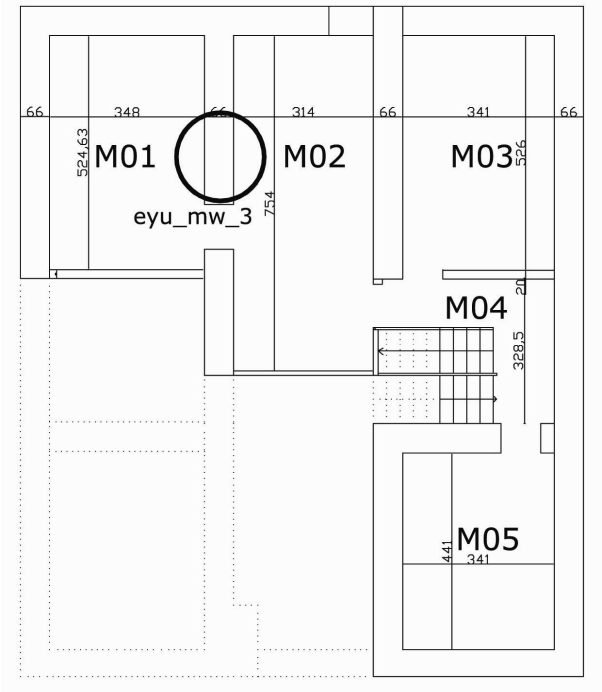


Figure 138 Mezzanine floor plan of the Eyüpoğlu House. Çelik, 2008.

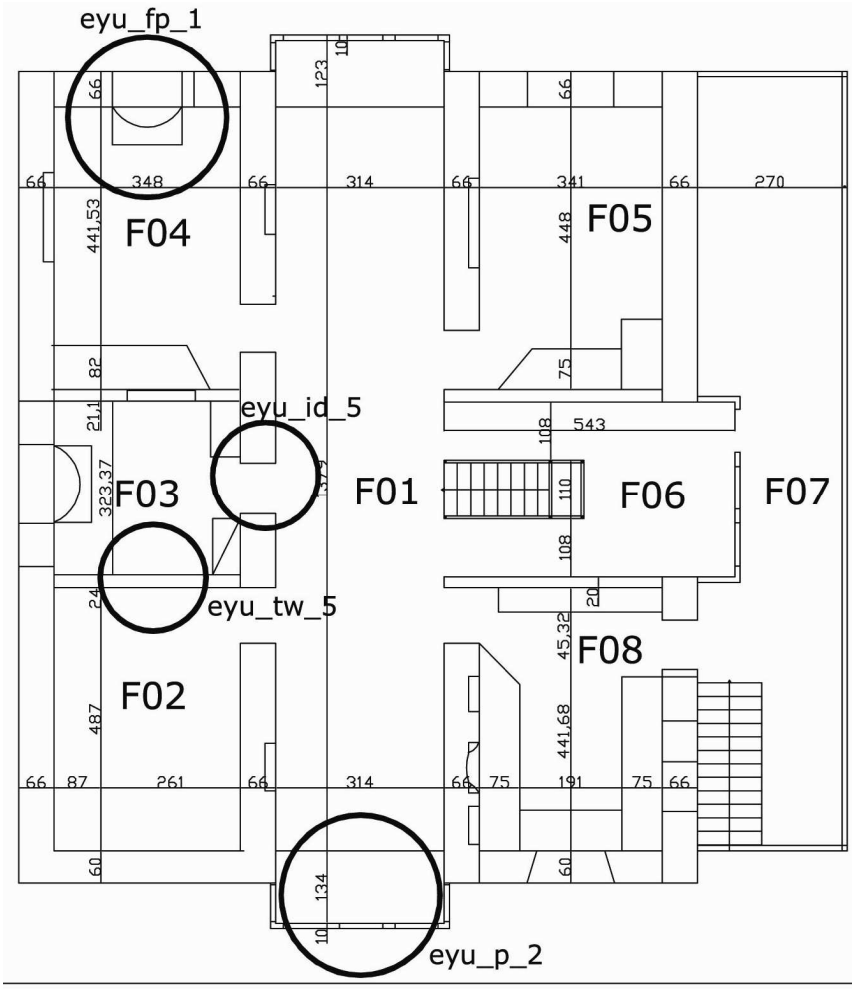
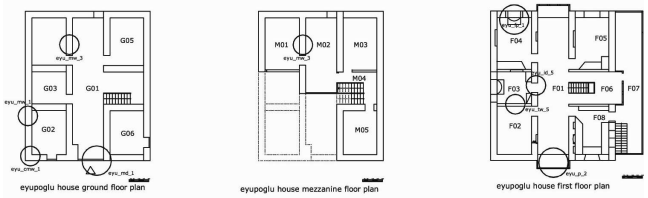


Figure 139 First floor plan of the Eyüpoğlu House. Çelik, 2008.

	ID: EYÜPOĞLU HOUSE Adress:
	Code: eyu_mw_1

DETAIL OF THE WALL



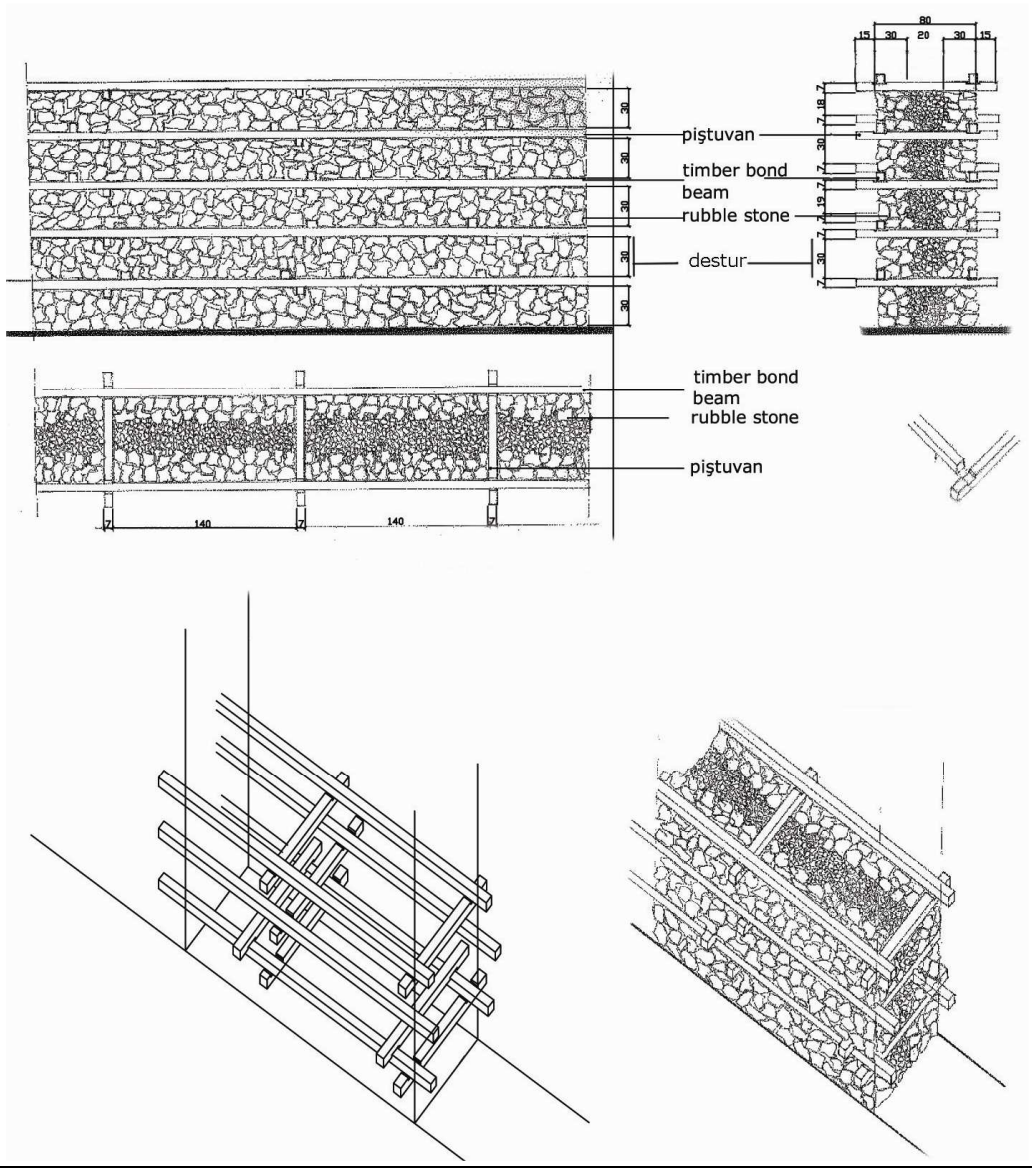


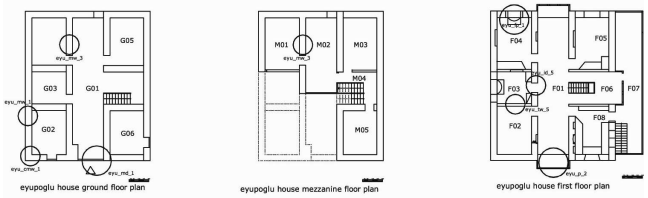
Figure 140 Record card of the detail of the wall of the Eyüpoğlu House. Çelik, 2008.

Figure 141 View from Eyüpoğlu House. Çelik, 2008.

Figure 142View from earth floor of the Eyüpoğlu House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: EYÜPOĞLU HOUSE Adress:
	Code: eyu_mw_1

DETAIL OF THE WALL



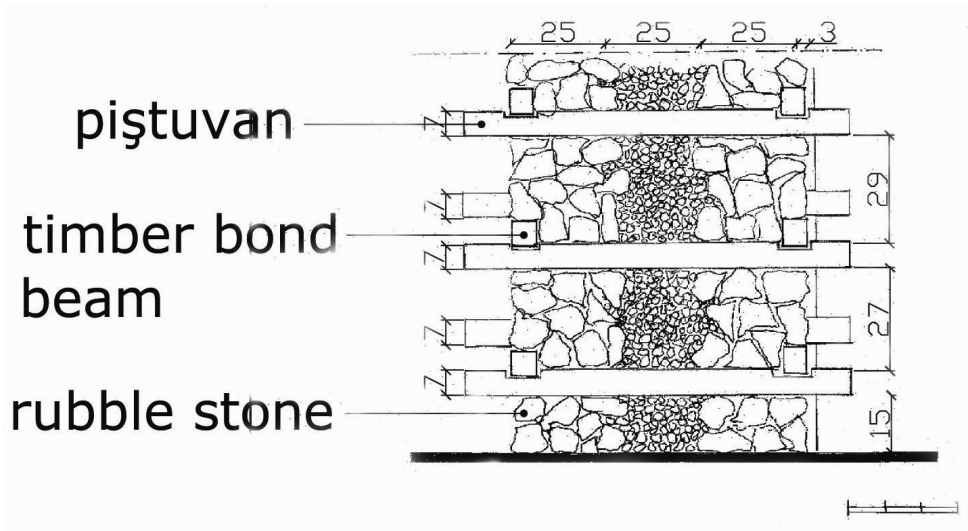
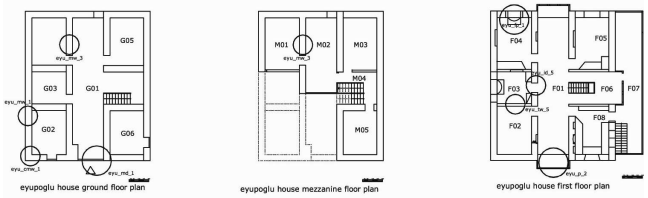


Figure 143 Record card of the detail of the wall of the Eyüpoğlu House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: EYÜPOĞLU HOUSE Adress:
	Code: eyu_mw_3

DETAIL OF THE WALL



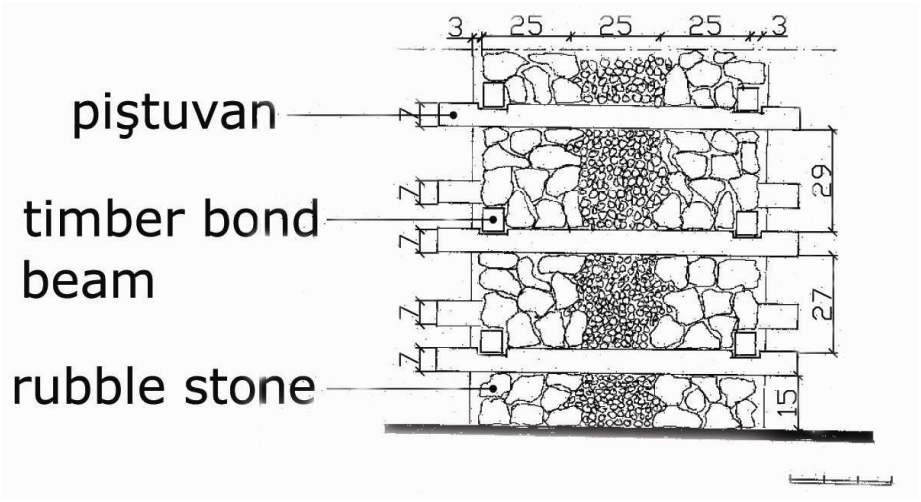
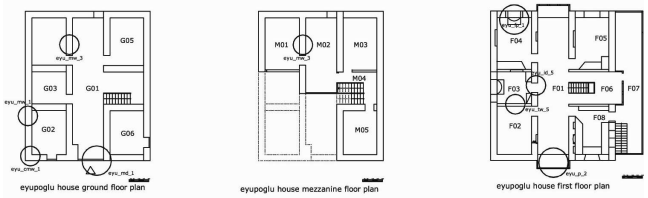


Figure 144 Record card of the detail of the wall of the Eyüpoğlu House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: EYÜPOĞLU HOUSE Adress:
	Code: eyu_mw_4

DETAIL OF THE WALL



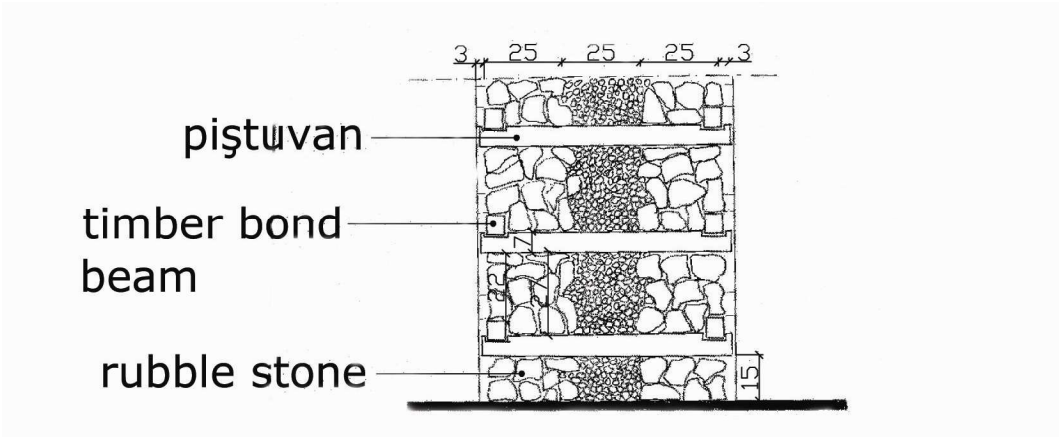


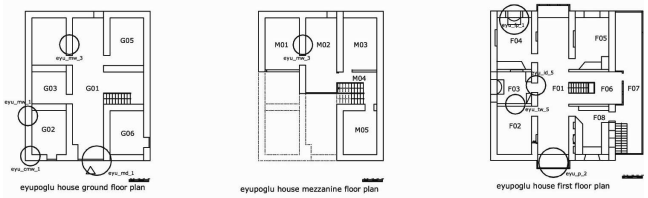
Figure 145 Record card of the detail of the wall of the Eyüpoğlu House. Çelik, 2008.

Figure 146 View from projection of the Eyüpoğlu House. Çelik, 2008.

Figure 147 View from wood lath wall of the Eyüpoğlu House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: EYÜPOĞLU HOUSE Adress:
	Code: eyu_cmw

DETAIL OF THE CONNECTION OF THE WALL



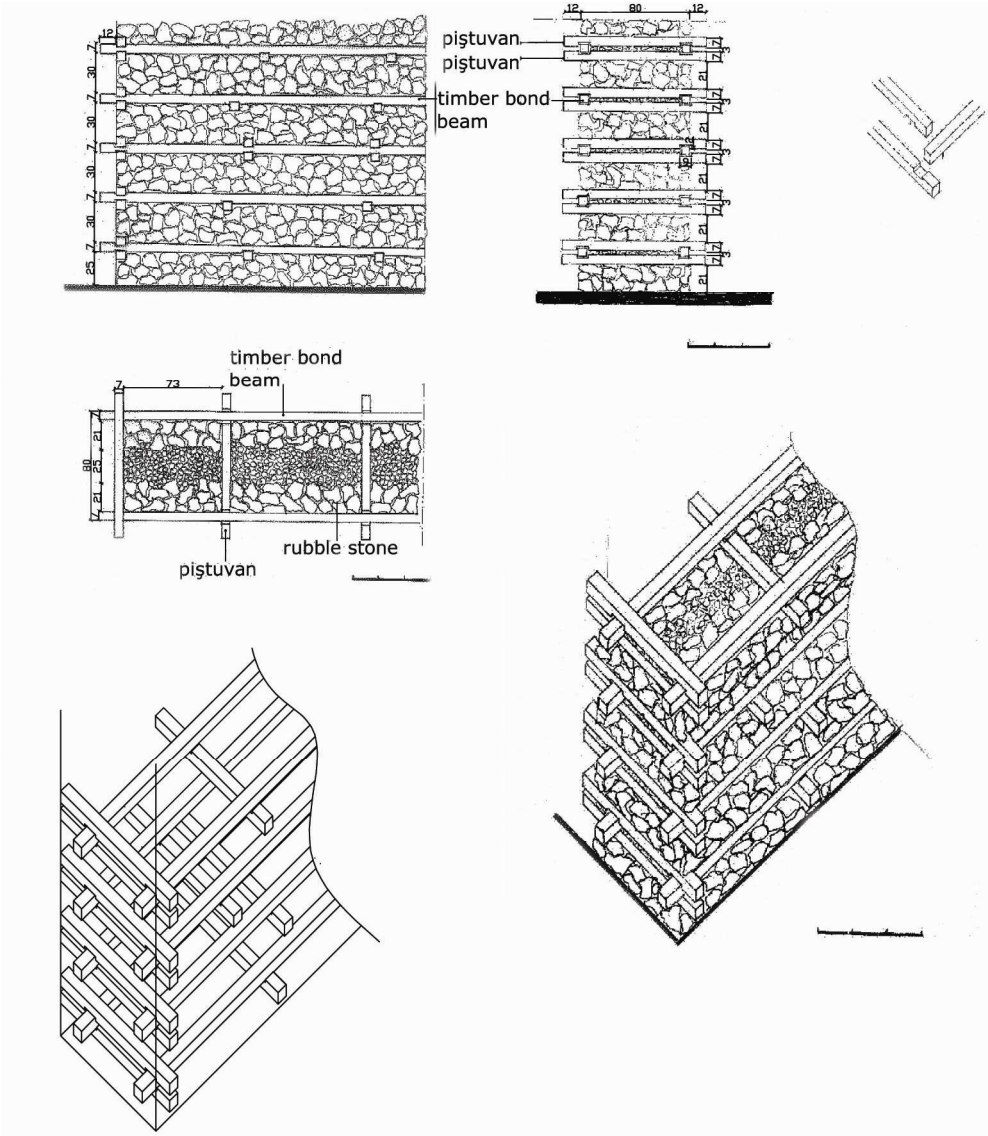
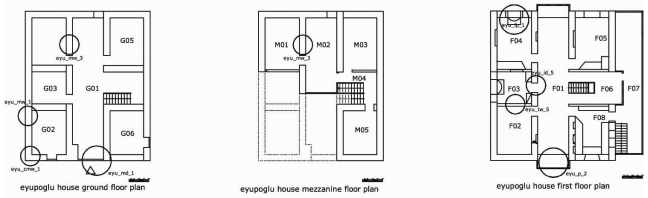


Figure 148 Record card of the connection of the wall of the Eyüpoğlu House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: EYÜPOĞLU HOUSE Adress:
	Code: eyu_tw_5

DETAIL OF THE TIMBER WALL



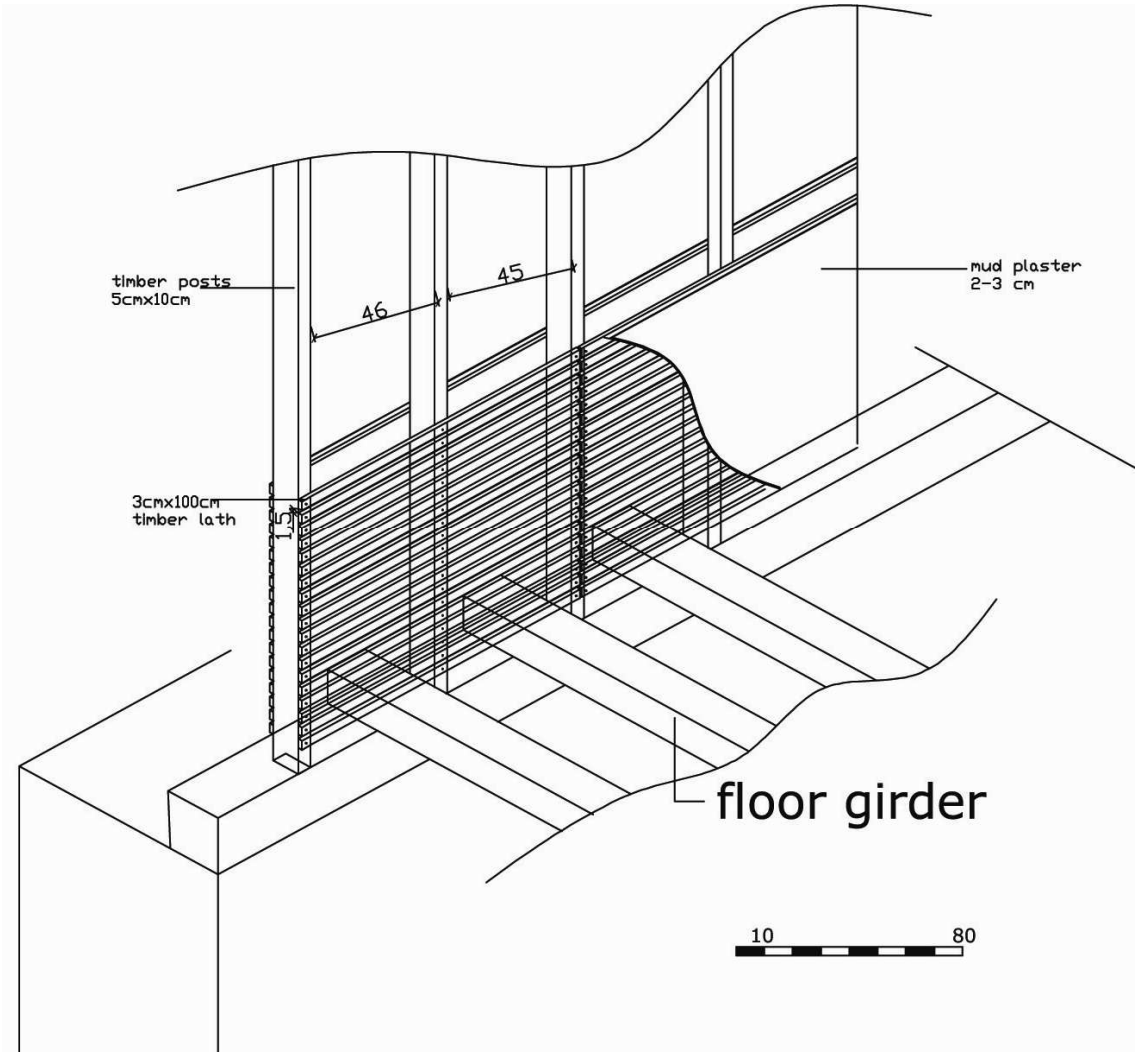
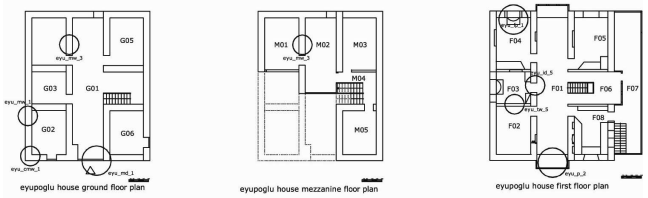


Figure 149 Record card of the wood lath wall of the Eyüpoğlu House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: EYÜPOĞLU HOUSE Adress:
	Code: eyu_fc_e

DETAIL OF THE FLOOR



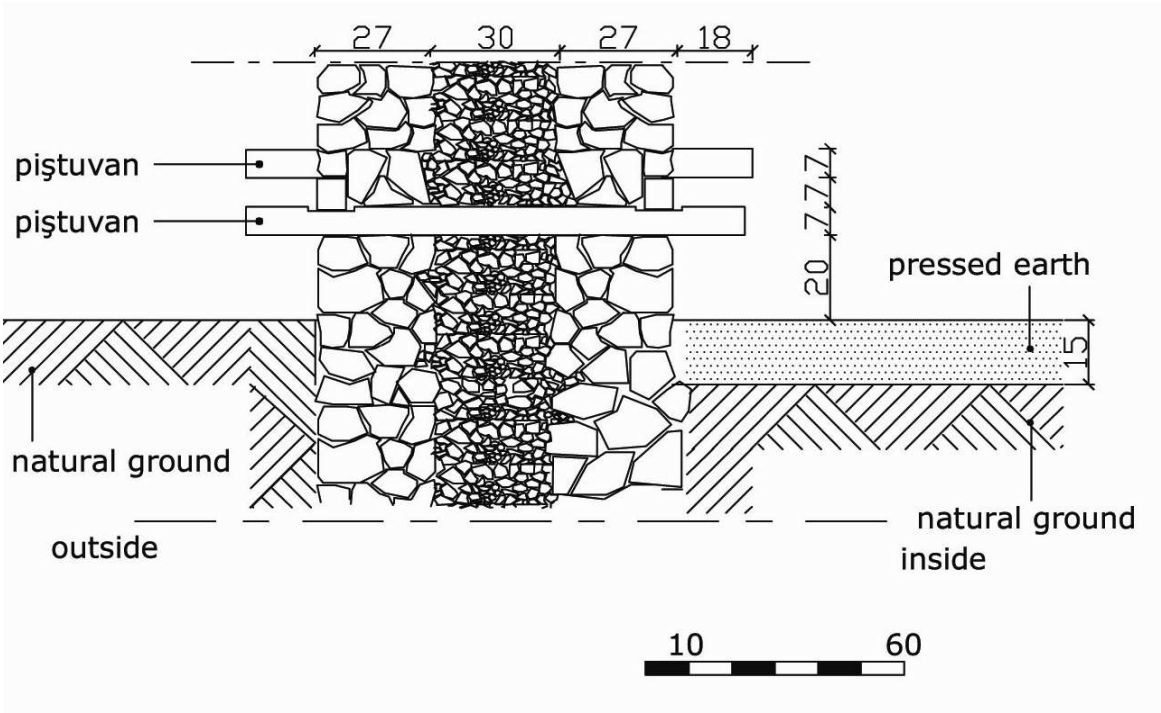


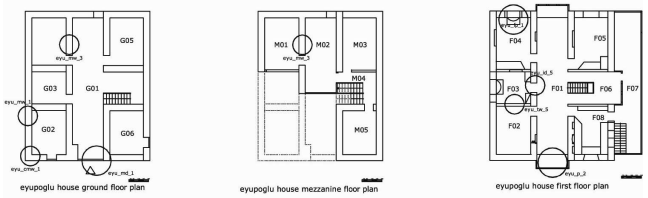
Figure 150 Record card of the earth floor of the Eyüpoğlu House. Çelik, 2008.

Figure 151 View from earth floor of the Eyüpoğlu House. Çelik, 2008.

Figure 152 View from the roof of the Eyüpoğlu House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: EYÜPOĞLU HOUSE Adress:
	Code: eyu_fc_1

DETAIL OF THE FLOOR



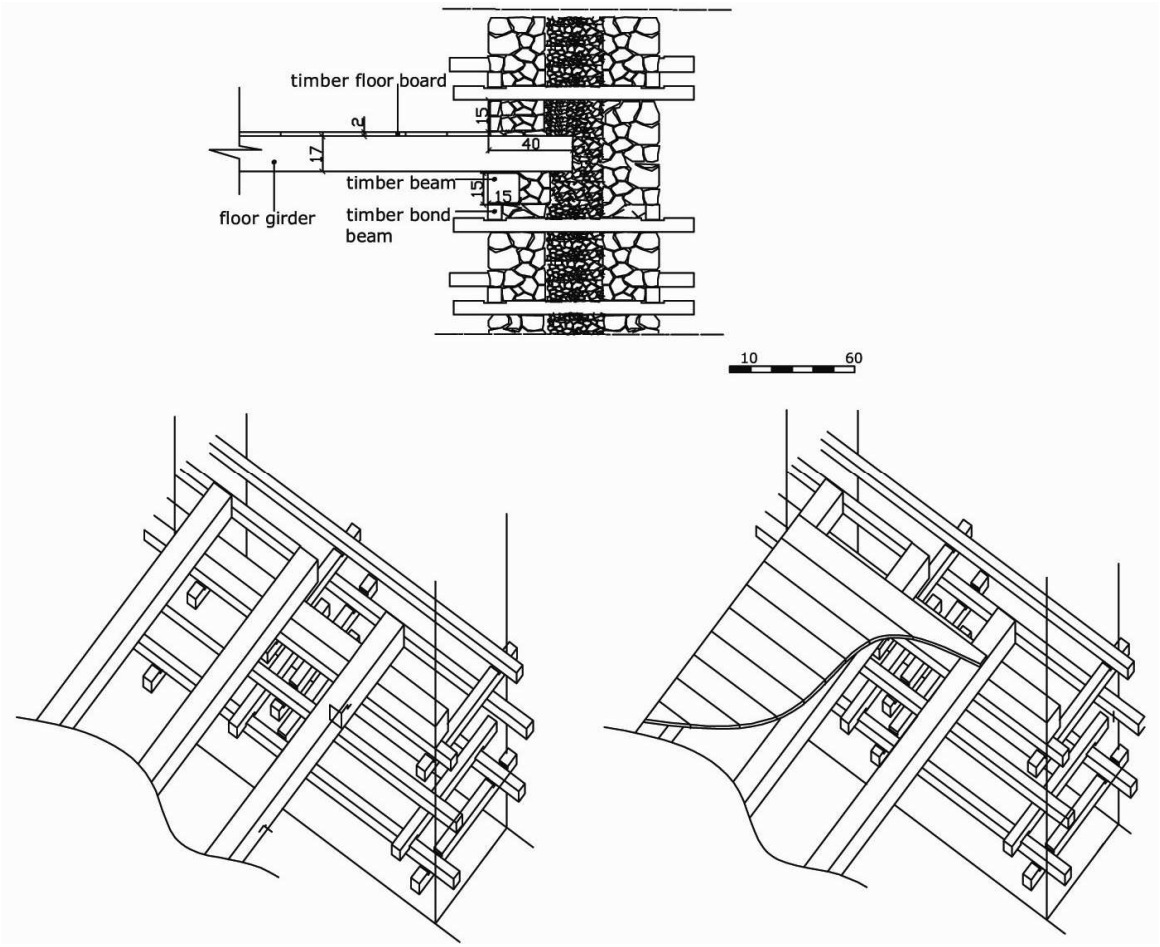
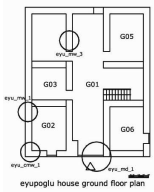


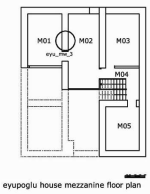
Figure 153 Record card of the floor of the Eyüpoğlu House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: EYÜPOĞLU HOUSE Adress:
	Code: eyu_fc_2

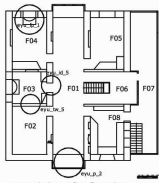
DETAIL OF THE CEILING



eyupoglu house ground floor plan



eyupoglu house mezzanine floor plan



eyupoglu house first floor plan

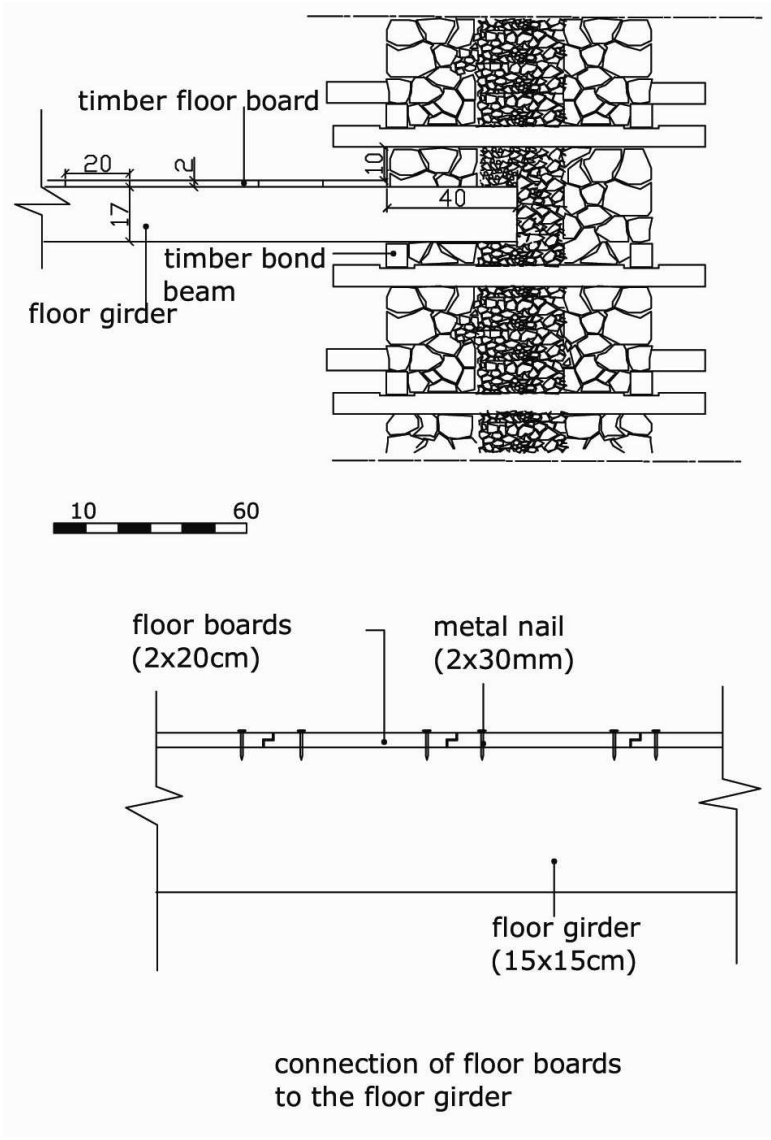
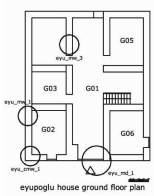


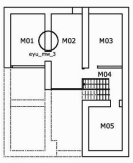
Figure 154 Record card of the floor of the Eyüpoğlu House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: EYÜPOĞLU HOUSE Adress:
	Code: eyu_c_2

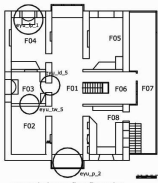
DETAIL OF THE CEILING



eyupoglu house ground floor plan



eyupoglu house mezzanine floor plan



eyupoglu house first floor plan

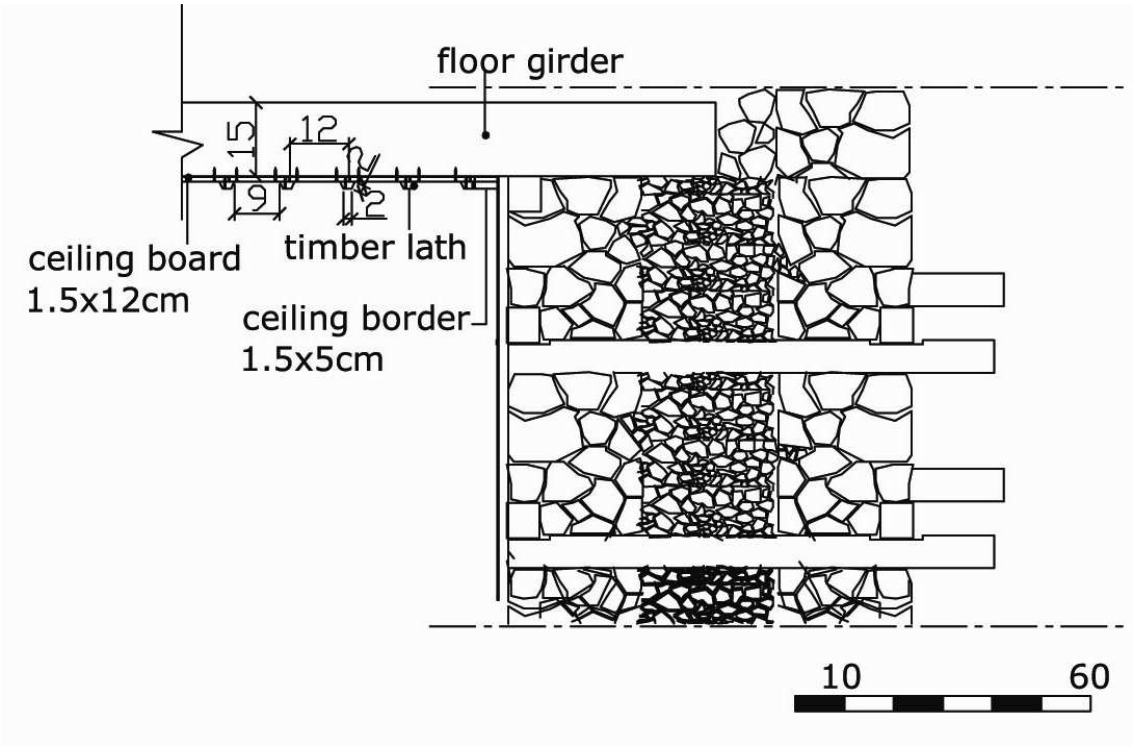


Figure 155 Record card of the ceiling of the Eyüpoğlu House. Çelik, 2008.

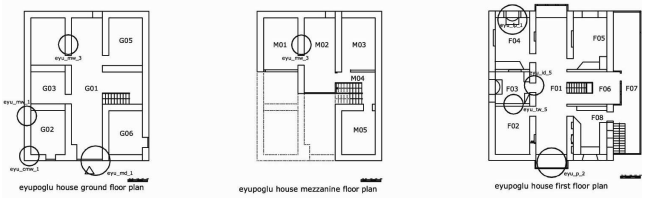
Figure 156 View from the ceiling of the Eyüpoğlu House. Çelik, 2008.

Figure 157 View from the interior door of the Eyüpoğlu House. Çelik, 2008.

Figure 158 View from the interior door of the Eyüpoğlu House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: EYÜPOĞLU HOUSE Adress:
	Code: eyu_id_4

DETAIL OF THE CEILING



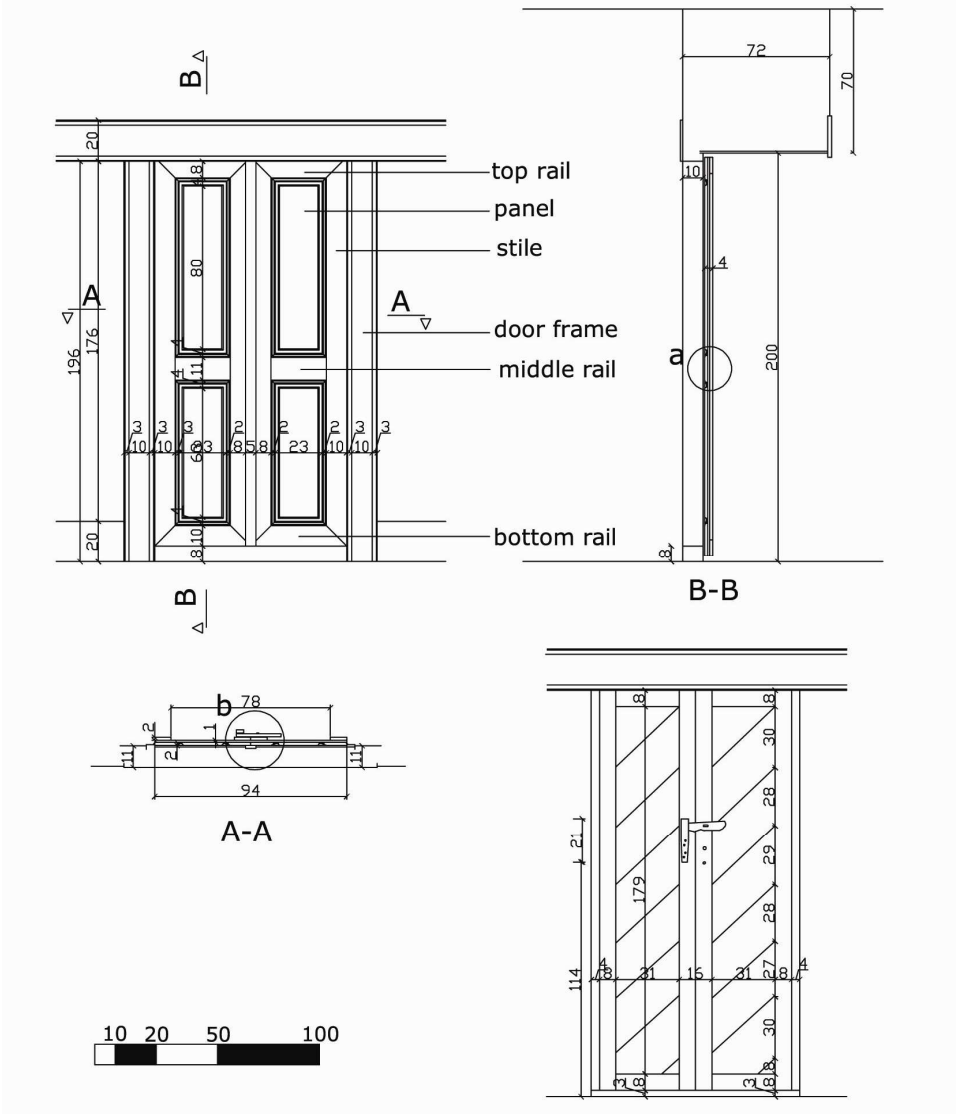
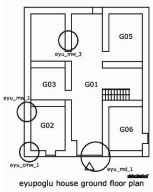


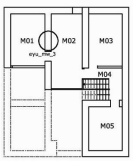
Figure 159 Record card of the interior door of the Eyüpoğlu House. Çelik, 2008.

METU GRADUATE PROGRAM IN RESTORATION CONSTRUCTION TECHNIQUES OF TRADITIONAL ORMANA HOUSES ORMANA/ANTALYA 2008-2009 SPRING SEMESTRE	Thesis by Gülşah Çelik Supervisor: Dr. Fuat Gökce
	ID: EYÜPOĞLU HOUSE Adress:
	Code: eyu_id_4

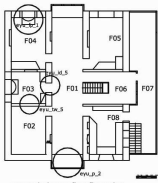
DETAIL OF THE INTERIOR DOOR



eyupoglu house ground floor plan



eyupoglu house mezzanine floor plan



eyupoglu house first floor plan

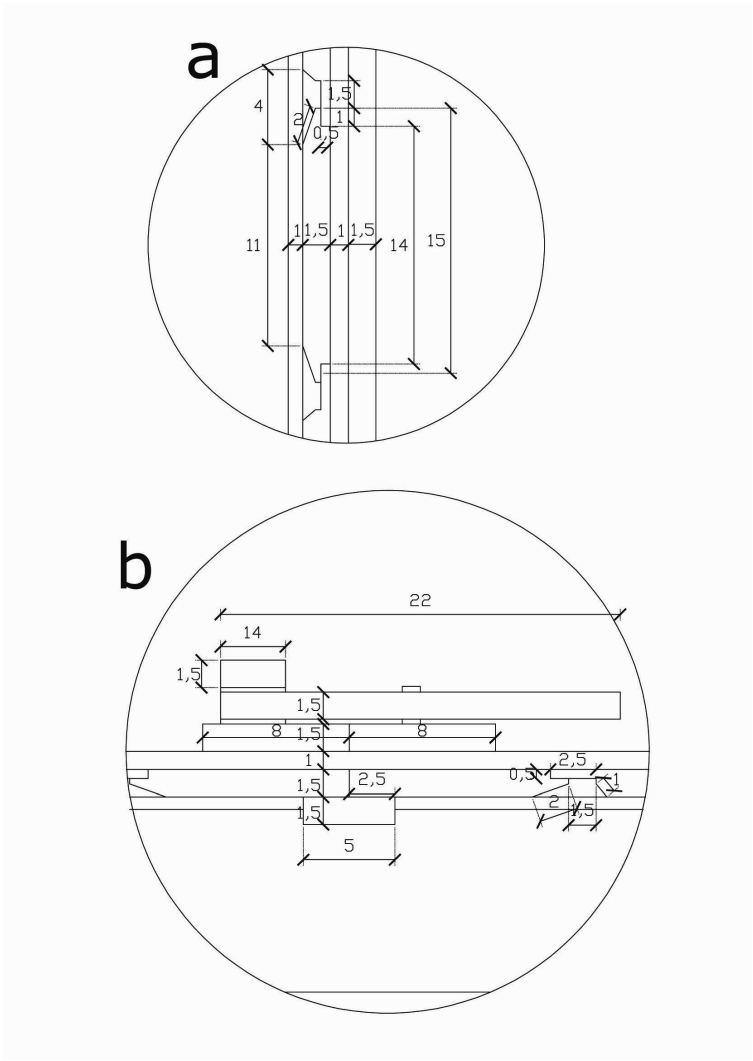


Figure 160 Record card of the interior door of the Eyüpoğlu House. Çelik, 2008.

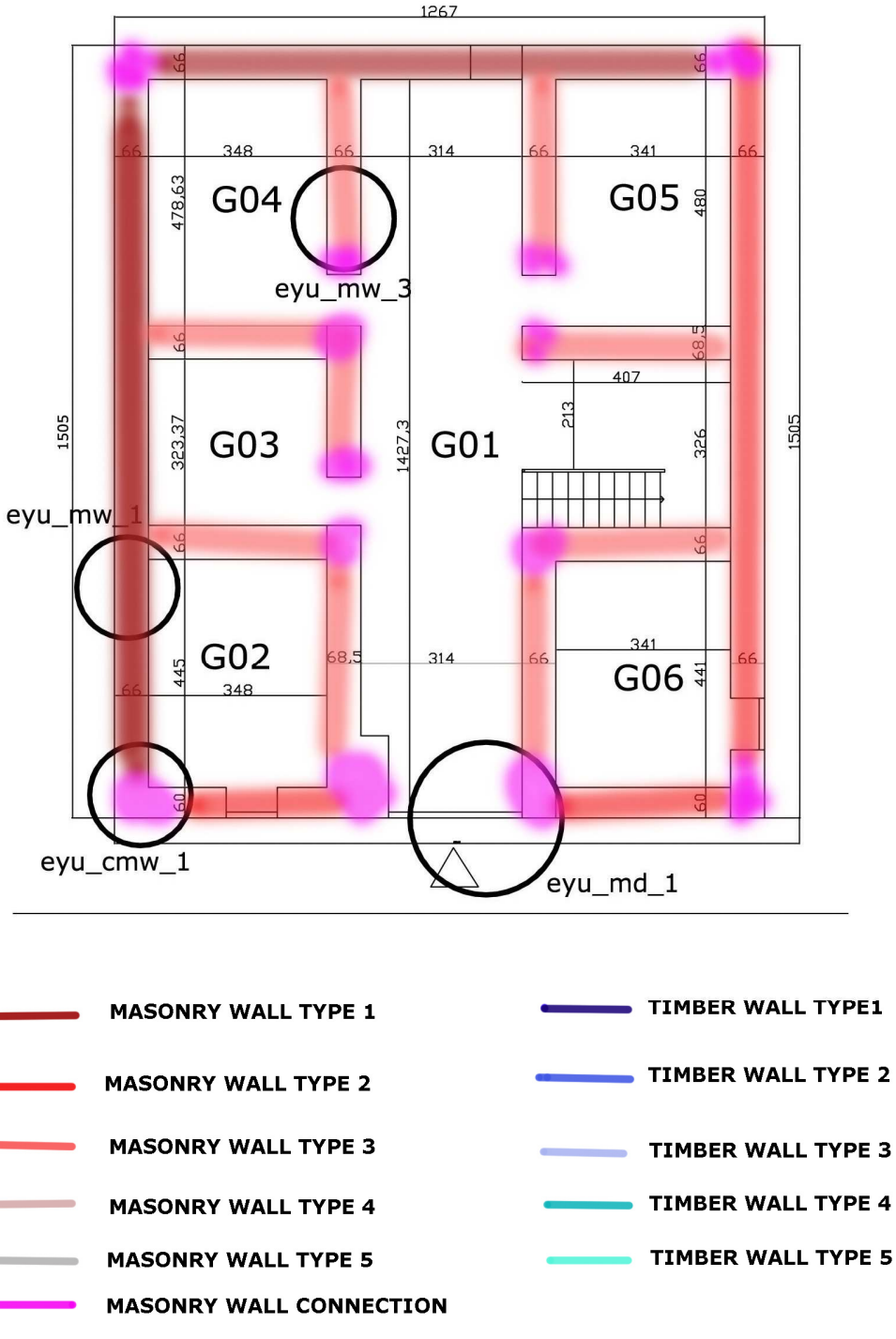


Figure 161 Distribution of the wall types of the Eyüpoğlu House. Çelik, 2008

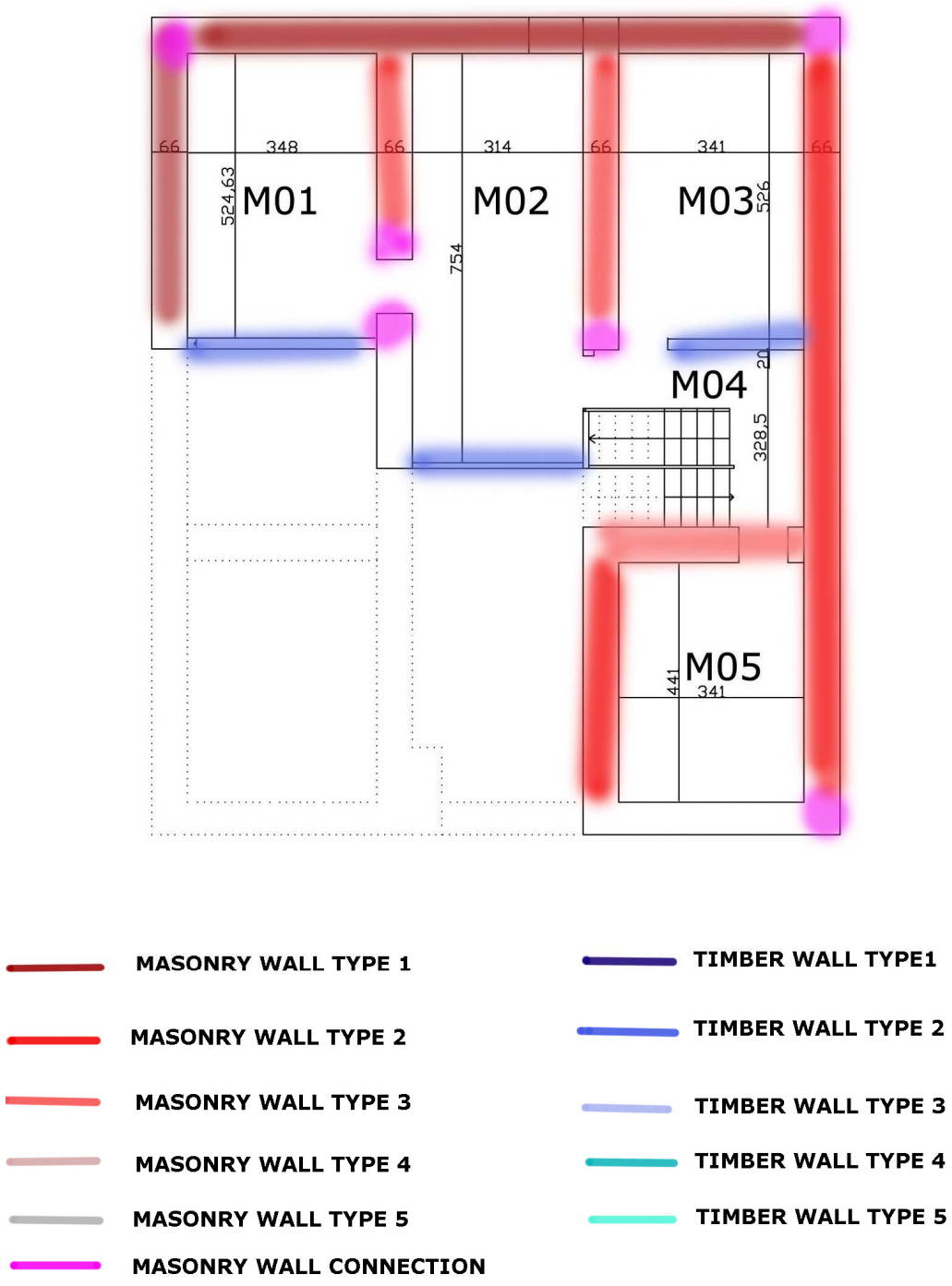


Figure 162 Distribution of the wall types of the Eyüpoğlu House. Çelik, 2008

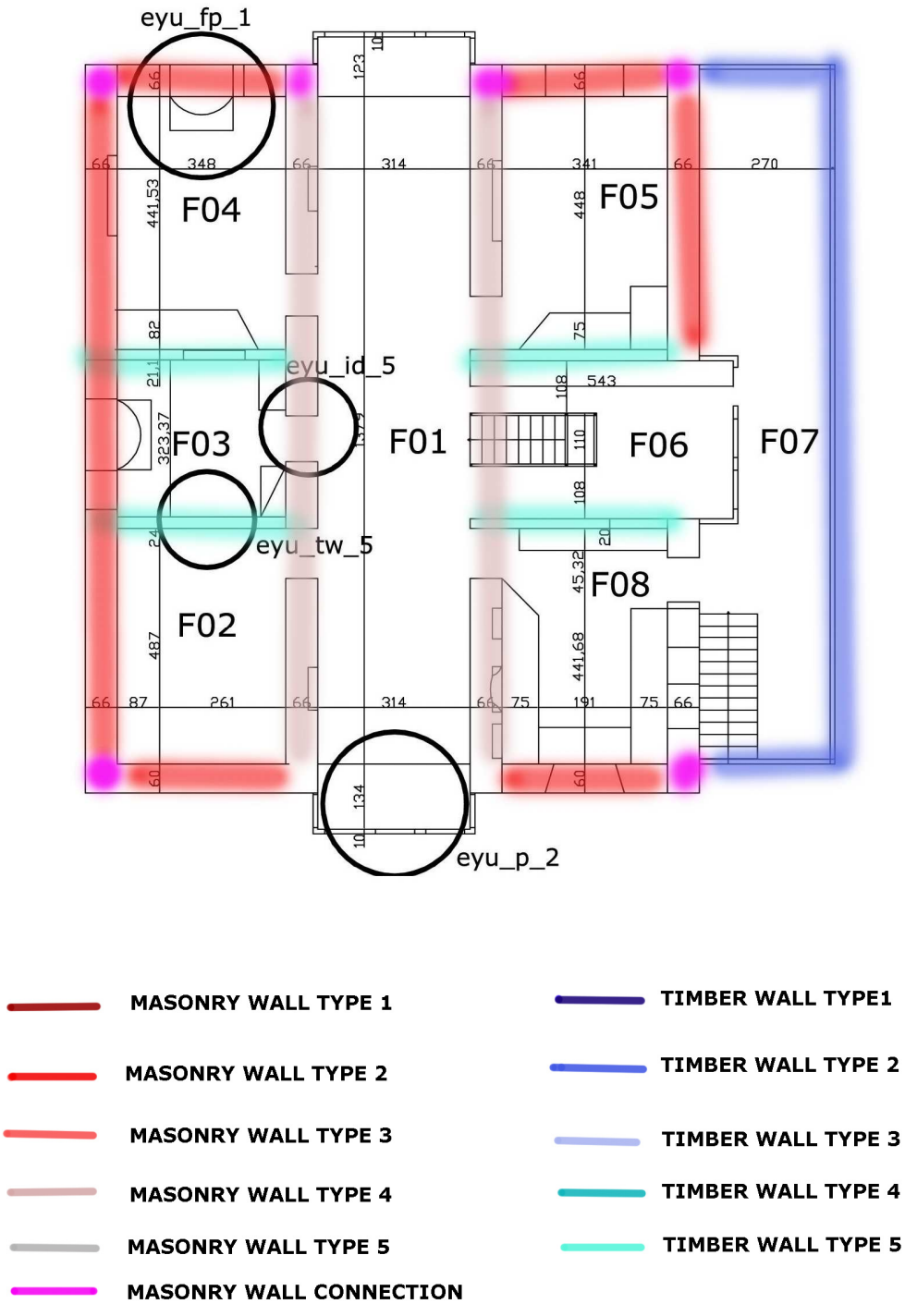


Figure 163 Distribution of the wall types of the Eyüpoğlu House. Çelik, 2008