PRINCIPLES AND PROPOSALS FOR CONSERVATION AND ADAPTIVE REUSE OF TRADITIONAL DEPOT BUILDINGS IN AYVALIK

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PRINCIPLES AND PROPOSALS FOR CONSERVATION AND ADAPTIVE REUSE OF TRADITIONAL DEPOT BUILDINGS IN AYVALIK

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ABSTRACT

PRINCIPLES AND PROPOSALS FOR CONSERVATION AND ADAPTIVE REUSE OF TRADITIONAL DEPOT BUILDINGS IN AYVALIK

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For a district like Ayvalık, which has a very strong industrial history, depot buildings are located within the historic commercial area and they are the heritage of the production process in the memories of inhabitants. This thesis offers a flexible modular design solution for the interiors of depot buildings and conserves them without intervening in historic building structures. With this approach, it is aimed to use the buildings as a shell and utilize them in a functional manner with reversible design strategies. The proposal will be developed according to the obtained parameters, from field surveys that were carried out for eight different depot buildings and modular design principles with respect to reversible design ideas.

Keywords: Adaptive Re-use, Ayvalık, Depot Building, Flexibility in Design, Industrial Heritage, Modular Proposal

ÖZ

AYVALIK GELENEKSEL DEPO YAPILARININ KORUNMASI VE YENİDEN KULLANIMA UYARLANABİLİRLİĞİ İÇİN ÖLÇÜTLER VE ÖNERİLERİ

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Ayvalık gibi endüstriyel geçmişi çok güçlü olan bir yer için, tüm ticari faaliyetlerin bulunduğu alana yayılmış olan depo binaları kullanıcıların hafızalarında üretim sürecini anımsatan mirasıdır. Bu tez depo binalarını korumak amacıyla, tarihi strüktüre dokunmadan iç mimari bir çözüm olarak esnek ve modüler tasarım çözümü sunmaktadır. Bu yaklaşım ile binaları bir kabuk olarak kullanmak ve fonksiyonel bir şekilde kullanımlarını sağlamak amaçlanmaktadır. Öneri alanda ölçümü yapılan ve belgelenen sekiz binadan alınan ve modüler tasarımın getirdiği parametrelerden yararlanarak, geri dönüşümlü tasarım fikrine bağlı kalarak gelişecektir.

Bu çerçevede tez kapsamında, ilk olarak endüstriyel mirasın korunmasının gerekliliği ele alınmış ve Ayvalık özelinde incelenen problemin tanımı yapılmıştır. Tezin amacı ve kapsamı ve bir iç mimarın problem ele alış biçimi ile birlikte tezin strüktrü bu bölümde oluşmuştur. Daha sonrasında ikinci bölümde tarihi yapıların yeniden kullanımı ve bu kullanımlarda modüler tasarımın yeri, Türkiye ve Dünya örnekleri ile birlikte ele alınmış ve Ayvalık depo binalarının yeniden kullanım stratejisi için zemin hazırlanmıştır. Üçüncü bölüm; çalışılan depo yapılarının belgelenmesi ile birlikte, strüktürel durumları, mimari elemanları, sorunları ve potansiyellerinin detaylı olarak

çalışıldığı bölümdür. Buna ek olarak dördüncü bölümde tüm bu çalışmalardan edinilen verilerin değerlendirmeleri yapılmış, yapıların değer, sorun ve potansiyelleri çalışılan yapı istatistiklerine göre tablolaştırılmıştır. Bu değerlendirmeler, aynı zamanda beşinci bölümde sunulacak tasarım önerisine çıkarımları ile ışık tutmuştur. Son olarak beşinci bölümde Ayvalık depo binalarının farklı kullanımları için benzerlerine örnek temsil edebilecek bir modüler tasarım önerisi sunulmuştur.

Anahtar Kelimeler: Ayvalık, Depo Yapıları, Endüstriyel Miras, Modüler Öneri, Tasarımda Esneklik, Yeniden Kullanım

To my parents and beloved husband

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CHAPTER 1

INTRODUCTION

Ayvalık is a “place” that has been subject to research from the early modern era to present. Starting with the Suna Kabasakal’s 1987 master’s thesis, “A study on re-functioning of the 19th-century industrial buildings, a case study in Ayvalık center area” some academic researches are focused on the industrial zone of Ayvalık which started in the last quarter of 19th Century. Upon the acquired knowledge from this work, in 2005, for one semester, in the schedule of the course REST 507-Design in Restoration 3 in Graduate Program in Restoration in METU, a conservation and development project was prepared by the students. With that great effort, pieces of information about the western part of the industrial zone of Ayvalık has mostly been studied with its traditional pattern, factories, and depot buildings. After that, in the light of those researches, the thesis written by Esra Terzi in 2007 and Gürem Özbayar in 2013 were written. Finally, the thesis written by Gözde Yıldız in 2017 conducted a study about the northern part of the seaside industrial zone. Besides academic researches, Ayvalık has been a place which seen worth to write, produce and take inspiration by both locals and foreigners.

The reason behind those mentioning’s about mostly academic writings is that the thesis that attempted to be written is a comprise of those bits and pieces of acquired information and try to add a new perspective for the sustainability of use statuses of the heritage buildings. In that respect, with a holistic approach derived from heritage conservation and interior design, a functionally optimized and user/human-based intervention route was attempted.

In this thesis, alternative uses of the architectural heritage of the industrial era subject to conservation, Ayvalık depot buildings is the main objective. The UNESCO definition made for this small city is “Industrial landscape of Ayvalık” which located in the Western part of Anatolia. Ayvalık was accepted to the tentative list of UNESCO in April 2017 with having outstanding example of social and economic structure of 19th-century industry-based olive oil production (World Heritage Centre, 2017). With the following generations, some of the properties inherited from this era continued without change. One of the inheritances from 19th century is the architecture of the related period. Going beyond the architectural perspective, Ayvalık also continues the lifestyle of the industrial city with its olive industry as a traditional economic activity (Şahin Güçhan, 2008). Ayvalık represents its historical background which remaining from the Greek (Rum) ancestors from the 18th and 19th centuries. The continuation of the land use of Rums[1] and Turkish people both in the same geography even though reduced is still ongoing. The demography changed after the population exchange in 1923 and according to the Treaty of Lausanne, the Rum population living in Ayvalık was forced to migrate to places with a majority of Greek population. At the same time, Turks who were living in those lands were obliged to settle in the Turkish lands. This incident has affected the development of Ayvalik closely and has disrupted economic fluency. Although there have been discrepancies, olive trees, and the olive-oil production have continued their lives. The residents of Ayvalık have tried to adapt to today’s conditions with improved production qualities and the continuation of production (World Heritage Centre, 2017).

1.1. Why Should Industrial Heritage be Conserved?

The term “industrial archaeology” derived following the idea of conserving industrial monuments which include industrial areas, buildings, and mechanical equipment. It refers to the field of industrial production and all physical remains and memory

[1] 'Rum' is defined as Greeks [Orthodox, East Romans] of Anatolia, Greek speaking- Christians under Ottoman rule. The word 'Rum' is derived from 'Romeus' (Roman_east roman_) **Geçersiz kaynak belirtildi.**. In this thesis, it will be used as 'Rum' when referring the Greek population under the Ottoman rule.

fragments of it which interested in conservation, archaeology along with the history of economy and technology (Köksal, 2012, p. 18).

From the personal dimension to the societal dimension, the industrialization fact that radically changes human life has revealed an industrial take-over. The shift in industrial transformation affects communities' lifestyles over industrialization and production and also quantitative, qualitative impacts have seen in all areas of life. It brings these terms "industrial heritage", "conservation" and "cultural heritage" to the agenda of cultures after they started to see the impacts of great changes. "Since the eighteenth century there has been a growing concern to record authentic sources of folk art and creativity as an expression of cultural identity" (Jokilehto, 1999, p. 304). When defining industrial heritage, the phrase covers the whole industrial civilization process and the work is done in that era. Hence; in the second half of 20th century, the abounding change correspondingly with the change in the mode of production led the spaces to be abandoned which were the first steps of industrialization. Along with this fact, the attention among conserving industrial archaeology, with all its branches and components in an integrated manner like habits of industrialized people, factory buildings and machines that left behind, had increased. Within that perspective, interventions started to be implemented among the initial cases of conservation of industrial heritage. Those implementations are mostly re-functioning projects, as those buildings cannot meet the demands with present conditions and needs of people.

In this part, the term "industrial heritage" will be analyzed with its historical and cultural background in a theoretical context and the reasons why it should be conserved. At last this analysis led us to the problem definition of this thesis, why Ayvalık Depot Buildings should be conserved?

The industrial revolution which constructed the modern lifestyle of the urban environment is a process of changing the previous values of heritage perception. With the modification of production mode, examples of the early industrialization and its effects on the style of living had been seen. The world organization TICCIH which represents the industrial heritage and the adviser of ICOMOS has a definition of industrial heritage as;

> Industrial heritage consists of the remains of industrial culture which are of historical, technological, social, architectural or scientific value. These remains consist of buildings and machinery, workshops, mills and factories, mines and sites for processing and refining, warehouses and stores, places where energy is generated, transmitted and used, transport and all its infrastructure, as well as places used for social activities related to industry such as housing, religious worship or education. (TICCIH; The International Committee for the Conservation of the Industrial Heritage, 2003)

In addition to TICCIH's definition, the culture of industrialization and the culture which is brought with the produced products are also important. With the UNESCO's decisions on safeguarding the intangible cultural heritage in 2003, heritage has begun to be addressed holistically. In the light of these developments, in the second part of the 20th century, industrial archaeology was defined with a wide and comprehensive view both in two-dimensional framework as built environment and intangible cultural heritage of industrial archaeology.

> The term industrial archaeology, even though it appears as the subject of those revealed in the industrialization era, due to the emphasis on the industry concept, encompasses a wide area including production-manufacturing, architecture, and equipment of the period. (Kıraç, 2010)

The historical period extends from the second half of the 18th century to the present day, which involves study of work and working techniques, while considering its earlier pre-industrial and proto-industrial roots (TICCIH; The International Committee for the Conservation of the Industrial Heritage, 2003). In order to make inferences about the existing values of industrial fabric, interpretation of it is the most important issue within all dimensions. The heritage values should be understood inside architectural context, but it has also cultural, sociological, economic, technologic and scientific values within the development process of industry which shouldn't be neglected. The type of industry that creates the whole context is a crucial point in the preservation of the unique pattern which departs it from the consequences of losing urban identity.

> It is important to understand the significance of the built heritage as living assets rather than as a stock of stones built on top of each other that should be preserved. The significance and the meaning of the heritage buildings should be taken into consideration in combination with the physical aspects. (Mısırlısoy & Günçe, 2016, p. 97)

All values belong to industrial sites vary, so every value for each occasion is unique. The answer to “Why we should conserve industrial heritage” is attached to each site’s specific properties and their specific importance for the related local community. According to the The Nizhny Tagil Charter For The Industrial Heritage; industrial heritage buildings “should be studied, their history should be taught, their meaning and significance should be probed and made clear for everyone, and the most significant and characteristic examples should be identified, protected and maintained, in accordance with the spirit of the Venice Charter, for the use and benefit of today and of the future”. (TICCIH; The International Committee for the Conservation of the Industrial Heritage, 2003, p. 1) Due to the rapid technological development and globalization; for every heritage site, there is a danger for losing identity because of the injections done in keeping with preserving actions. The fluctuations among social and economic settings are harmful to those sites, so when giving decisions on conservation actions, it is important to reconsider the shared identity of the industry and taking conservation actions into account with the consideration of community awareness and for the sustainability of communal heritage.

1.2. Problem Definition: Why Ayvalık Depot Buildings should be conserved?

As stated in the above section “1.1 Why Should Industrial Heritage be Conserved?” industrial buildings are the representatives of the development in industrial era of the related periods and they are important to be conserved. It is important for this thesis that what is the significance of Ayvalık Depot Buildings and why they should be conserved?

The similar single-spaced historic depot building stock spread among the industrial landscape of Ayvalık is the most important reason for the sustainability of the industrial landscape. Ayvalık is a district that has a powerful industrial background which disunited with a part of its urban identity because of the population exchange As it is mentioned in Şahin Güçhan's article, in Dr. Şerafettin Mağmumi's memoir descriptions that he made shows us that, Ayvalık is now an integrated district with all of its urban tissue and elements (Şahin Güçhan, 2008, p. 75). In that context, despite alterations that local users made, depots zone conserves its original characteristics. As stated in the description part of the tentative list submission document of Ayvalık;

> The main city square is located in the south-east of Kanelo[2]. Historic depots and factories are located in the south-east of the city centre. While the commercial core follows the Kanelo axis and extends to the east of Ataturk Boulevard, depots region, stretching toward the residential zones in the east, crosses with narrow streets laid in the grid-iron plan formation. (World Heritage Centre, 2017)

[2] Kanelo is defined as the cape, near the sea where Ayvalık administrative and commercial buildings are usually located ((World Heritage Centre, 2017).

There are a bunch of studies made from 1987 to 2017 about Ayvalık, olive industry, the industrial commercial area, and industrial buildings. Those studies have enlightened the scope of this thesis with the information and data they offered. The so-called depots' region located at the southern part of the port of Ayvalık city center, were studied by, Kabasakal (1987), Terzi (2007), Özbayar (2014) in their theses and by a group of student from METU Graduate Program in Restoration,-REST 507-Design in Restoration 3 Studio- in 2005, within the scope of 'Conservation and Development Project for Ayvalık, Depots Region'. Following those studies, Yıldız (2017) was completed a study about the northern industrial zone located at the upper northern part of Ayvalık port. These studies provide detailed information about the significance of Ayvalık.

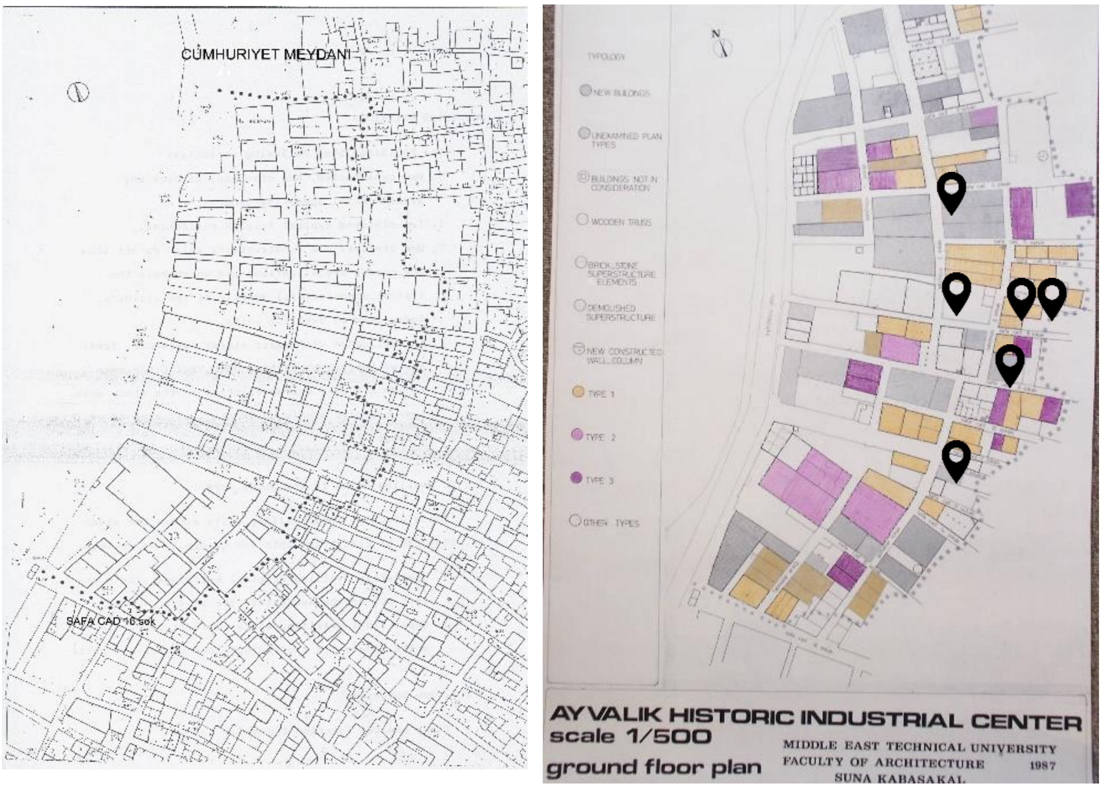


Figure 1.1. Left: Suna Kabasakal’s Study Area Located at the Southern Part of Ayvalık Port (1987), Right: Distribution of Buildings According to Facade Types in Kabasakal’s Study Area with Marked Studied Buildings in the Scope of This Thesis.

Firstly; Suna Kabasakal's thesis "A study on re-functioning of the 19th-century industrial buildings, a case study in Ayvalık center area" from 1987 which covers almost all commercial-industrial region was mentioned that; 71% of buildings were built in traditional technique are single-storeyed. In Figure 1.1, it can be seen; the study area, distribution of buildings in the area according to their façade types Kabasakal studied on. This area called as Ayvalık historic industrial centre and as can be seen, the structures marked with yellow are more than the others which are depot buildings studied in this thesis.

Chronologically the study made by REST 507 studio in METU graduate studio was coming after Kabasakal's thesis. It was made particularly focused on the depot region at southern commercial part which also studied by Kabasakal. On the other hand, Esra

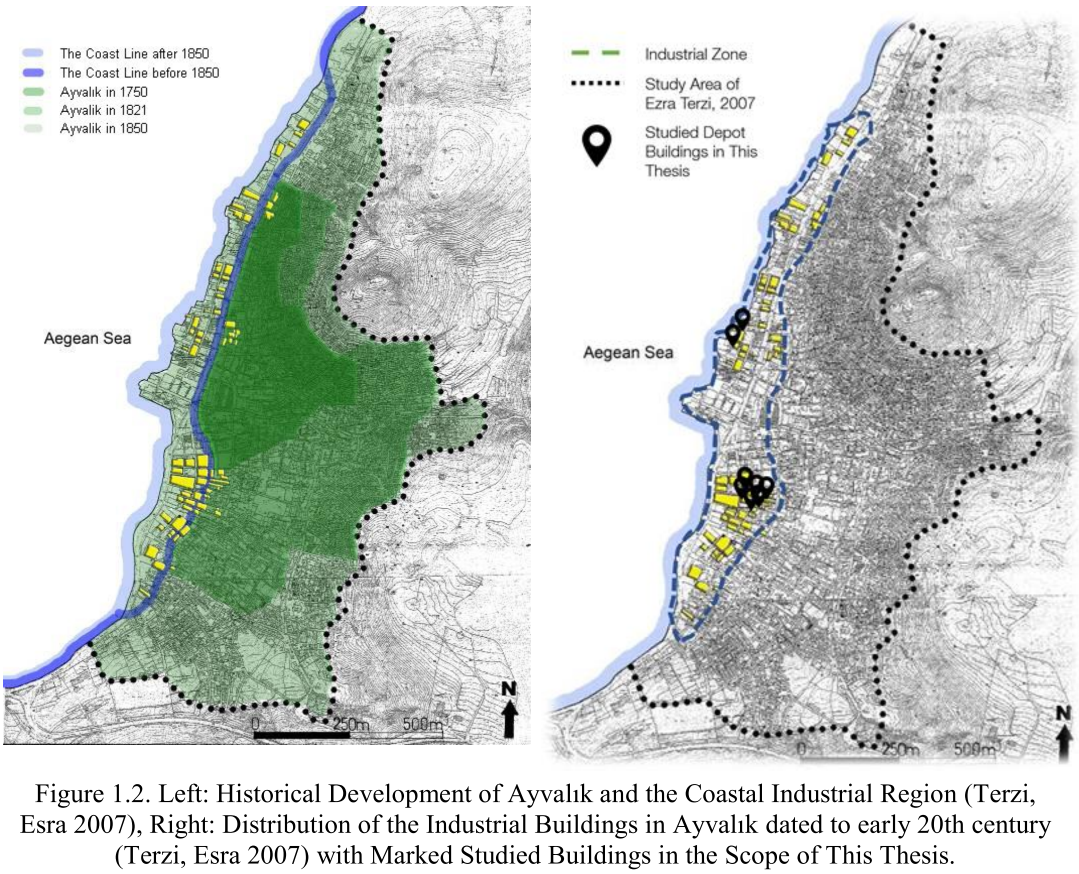


Figure 1.2. Left: Historical Development of Ayvalık and the Coastal Industrial Region (Terzi, Esra 2007), Right: Distribution of the Industrial Buildings in Ayvalık dated to early 20th century (Terzi, Esra 2007) with Marked Studied Buildings in the Scope of This Thesis.

Terzi's thesis about the olive oil industry and its effects on the settlement pattern of Ayvalık draws a scheme about the early 20th-century industrial commercial zone. Relying on Terzi's thesis, it can be said that, after 1850's Ayvalık reached its largest macro-form and the coastal settlement of Ayvalık become an industrial town during 19th century. (Terzi, 2007, p. 35)

To elaborate on the minds of the significance of Ayvalık industrial commercial center and depot buildings, it is important to put a mark on the building stock that it includes in itself. A suggestion was made by Terzi, for the missing information on the 19th-century olive oil production in Ayvalık and it is said that; the number of depots was approximately 40 in the first quarter of the 19th Century than; it was increased into 78 at the 4th quarter of the 19th century. It was suggested that in the first quarter of the 20th Century the number remained the same 78. On the date 2007 when Terzi's study completed, it is suggested that, there were 59 depot buildings. (Terzi, 2007) Today, according to the conservation plan technical sheets of Balıkesir province prepared by Utta Planning in Ankara, the number of traditional depot buildings is decreased into 50. (Utta Planning, 2019)

The interiors of those depot buildings are of particular importance since they are the loci of both existing and potential occupants. Their traditional details, spatial planning, and spatial properties represent the original users and also present users utilize traditional building beneficiaries today. Some of the depot buildings are abandoned and left to decay and diminish, others are misfunctioned and dangerous functions have given to depot buildings which cause buildings to lose their values. The impact of industrialization which removes industrial buildings away from the city center also affected Ayvalık after 1972 Development Plan. A landscape full of factories and auxiliary buildings became derelict and this plan affected Ayvalık more than most of the city centers because of its dense traditional industrial pattern. Along with this, in Turkey, industrial heritage sites are not respected and have seen as important architectural or archaeological heritage examples. Industrial sites are usually left without care and they are generally under the risk of demolition because of the lack of awareness.

There are also ongoing change requests by the owners and tenants of depot buildings for using their properties in a positive way for them. Insensible interventions because of different function suggestions are the problematic side of those change requests. The change in the economic trends and re-functioning problems are the crucial points that need to be solved with new design interventions and environmentally innovative processes.

1.3. Aim and Scope of the Thesis

The main aim of this thesis is designing alternative uses for traditional Ayvalık depot buildings which are a part of Ayvalık industrial historic pattern, for the continuation of their lives. For this aim, the designated intervention strategy is the adaptive re-use of buildings with a modular and flexible design solution.

For this reason, first of all, with the basic process of conservation of immovable cultural heritage, documentation, definition, and assessment of eight selected depot buildings in the building stock have been studied. The documentation of buildings includes hand measurements supported by taking systematic photographs. With the help of architectural sketches, measurements have been noted and then they converted into AutoCAD drawings. Definitions of architectural features have been made after the documentation process. The description criteria are grouped as (a) structural conditions of buildings, (b) architectural element definitions, (c) known stories of the related depot buildings and (d) assessments of buildings in which the study has been based on these definitions.

Along with this, for intervention strategy designation, information gathered from different case studies from Turkey and from World has been studied. Besides the assessments made upon depot building documentations, assessments driven from the modular design and adaptive re-use literature have been studied, as the adaptation process of buildings should be in a way that buildings will be treated as a shell structure. Thus, if their owners want them to use as depot buildings, they do not lose their original functions. Moreover, with proposed modular upgrades, their use-value is intended to be increased without giving any harm. In the same respect, for different functions, advantages of modularity and prefabrication have been used as a solution of adaptive re-use of those single-spaced depot buildings. Within this framework, the scope of the study also includes human factors. For an optimized human-oriented design proposal, principles of human factors for ergonomics of the present and future users have been included in this thesis.

1.4. Methodology

The research process followed for the development of this thesis follows certain connecting steps. Those steps are including the reasons and the results of each other. Data collection, processing the collected data, analysis of the data, evaluation, and conclusion are those steps (see: Table 1.1.).

Data collection starts with literature surveys as it creates the roots of understanding the place, main theme, and theory. To better understand the theoretical background of the study, studies by Cantacuzino (1975), Robert (1989), Powell (1999), Soğancı (2001), The Nizhny Tagil Charter for the Industrial Heritage (2003), Shittich (2003), Köksal, (2005), Smith, Lommerse, & Metcalfe (2014) have been chosen as major sources for the discussions for adaptive re-use, modular design and conservation of industrial heritage.

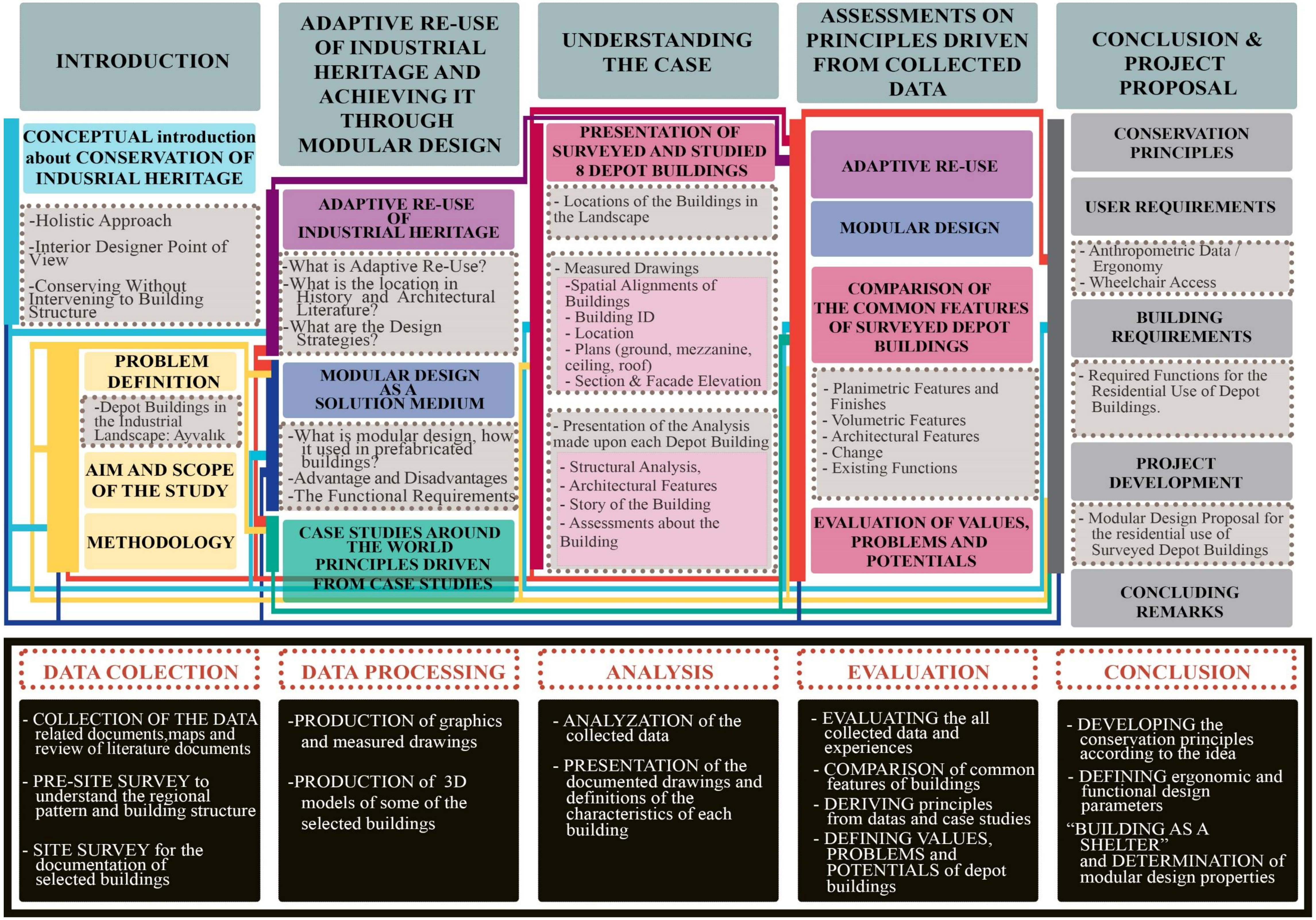
In order not to make restrictions about the re-use examples chosen from Turkey and around the World, both internet sources and written sources have researched and plenty of the researches was made on-site by the author. As written sources, Brooker & Stone (2011), Büyükarslan & Güney (2013), Brooker (2013) and Condello (2016) were used. Many of the cases were found as architectural projects in architectural web portals. The names of researched web sites are; ArchDaily, Heritage Council Victoria, Studio Bark, and Dezeen x Mini Living. The selection criteria for those examples have made according to the compliance with the case Ayvalık Depot Buildings and some criteria determined for selection. The selection criteria of case studies were made according to 3 points.

1. Is the building treated as a shell structure upon the new insertion?
2. Is the new insertion designed in a modular design manner?
3. Are there any flexible and reversible characteristics in inserted design?

In order to obtain relevant information totally, eleven examples were selected throughout the world. Three of them are examples from Turkey. The evaluations were made according to selected ten characteristics pertaining to the aim and scope of the thesis (See: Section 4.2).

While above-mentioned sources were used for the investigation why we should conserve heritage and what are suitable ways, the idea of modular design, its definition and philosophy have become a crucial point for the stem of the thesis. This input becomes a part of the data processing step of the thesis and the main sources were used to develop analysis upon modular design are, Ulrich & Tung (1991), Chang & Ward (1995), Gershenson, Prasad, & Zhang (2003), Russell (2012), Smith R. J. (2009), Smith R. (2010), Sosale, Hashemian, & Gu (1997). The results are presented in Sections 2.2 and 4.1.

Table 1.1. Methodology of the thesis



In the next step, Ayvalık has been investigated as an industrial landscape; the history and development of the industrial formation are primarily focused points while reviewing the whole architectural and urban history. The written sources by Erim (1948), Bayraktar (1998), Yorulmaz (2000), Psarros (2004), Şahin Güçhan (2008) are used for understanding the historical background of Ayvalık. The written sources which enable superposing this historic background and the urban and industrial settlement are, Kabasakal Coutignies (1987), Özbayar (2014), Terzi (2007), Yıldız (2017). In addition to this, most of the information is gained from the project made in 2005 METU Graduate Program in Restoration,-REST 507-Design in Restoration 3 Studio.

Özbayar (2014) and Terzi's (2007) researches were also used in this study regarding Ayvalık urban settlement and industrial landscape. Although these works mostly focused on the southern part of historic city center, for the northern part, Terzi (2007) and Yıldız's (2017) researches guided the formation of the thesis at that part. The designation of the existing pattern of the study area was based upon those above-mentioned studies and after then, for the selected depot buildings, gathered information was used and documentation (written, oral and visual documentation) about depot buildings has made accordingly and character and significance of depot buildings defined with the current statuses of buildings.

When it comes to the documentation process, in December 2015 with a pre-site survey was made for the selection of the site for research. The first field trip for understanding the place and for the designation of the depot buildings was made on September 2016. In October 2016 during a ten-day field survey, eight depot buildings have studied one by one. For each one, architectural sketch drawings were prepared, hand measurements were taken. With visual observations, and taken photographs, problems of the buildings have been documented and interviews were made with users and owners in the same respect. Thus, at the end of field survey the data processing duration started and measured survey drawings and architectural descriptions upon the selected buildings were made until June 2017. Structural, architectural and material characteristics for each building has investigated. The given details for each building are grouped in 4 headings as;

1. Structural Condition of the selected depot building
2. Architectural Elements of the selected depot building
3. The Story of the selected depot building and Its Change
4. Assessments on the selected depot building

At the same time, data about the important themes which are adaptive re-use, modular design and ergonomy have collected for the third part of the thesis which is called "analysis".

The collected data about buildings are combined at the analysis part which is the fourth step of thesis. General description and characteristic properties of buildings are grouped and tables which shows architectural aspects of buildings were prepared for the evaluation part. The problems, values, and potentials mentioned at data processing part for each building, are combined according to the quantitative list and percentages have been collected for acquiring the most problematic and significant parts of buildings. Thereafter, assessments about all analyzed data and obtained information from various branches analyzed, are used as data which give direction to the proposal of the design at the evaluation step. Finally, the modular infill which allows buildings for sustainable and optimal use has been proposed with respect to the assessments gathered from analysis about buildings, reuse examples, and human ergonomics.

1.5. Approach of Interior Architect and the Structure of Thesis

Related to the issue of this thesis it is thought that, the role of interior architecture contributes to social engagement of physical aspects. As a profession, interior architecture generally has a position coordinating different professions to develop the living architectural project in an optimized and human-oriented way. Architects, mechanical, electrical and structural engineers, landscape architects, investors are some of the coordinated actors of architectural projects. When interior architecture cooperated with heritage conservation, coordination of newly added focuses is becoming essential, as stakeholders, the local community, municipality, tenants, etc. Lommerse state this issue as;

> "I define community engagement as a cooperative process of working with people to address their wellbeing, crossing disciplinary boundaries, and using multiple knowledge from inside and outside the community." (Smith, Lommerse, & Metcalfe, 2014, p. 16).

With the contribution of complex and diverse fields, the role of interior architects in historic conservation becomes crucial for the use of obtained information. It has also a contribution to social sustainability by making the term "conservation" an attractive word in society by using its own awareness. Adaptive reuse of historic buildings, respective interventions to existing architectural heritage, re-using have become some of the concerns of whole design area. The particular role of interior architects in that area is human-oriented design proposals with given importance to ergonomics and sustainability with great effort with respect to the existing situation.

The issue which focused on in this thesis is particularly due to the undergraduate degree of the author, Interior Architecture and Environmental Design. In that respect; in our case, single-spaced depot buildings mostly used with their current problems and application mistakes which oriented according to the user needs. They need mostly some service spaces in order to sustain their lives inside buildings and as an interior architect, finding an optimal choice for user and the building with collaboration of different branches become intriguing. With that manner, a holistic approach has been elaborated in this thesis with assessments on various topics and collaboration of them, bringing the resolution for the case Ayvalık depot buildings.

CHAPTER 2

A REVIEW ON ADAPTIVE RE-USE AND THE USE OF MODULAR DESIGN AS A STRATEGY FOR IT

> We should not live in a bright shining new future, any more than we should hide in a comfortable pastiche of the past. We must inhabit an ever-evolving present motivated by the possibilities of change, restricted by the baggage of memory and experience. (Powell, 1999)

In today's contemporary agenda, reusing existing buildings with some small repairs and interventions is a fact that in daily life one can encounter a report or information about it. In this chapter, adaptive re-use as an approach to sustain the use of existing buildings will be evaluated as a strategy to conserve heritage buildings and in the second section of this chapter designing in modular understanding, its advantages disadvantages and effects on the construction management process are appraised.

First of all, terminologically adaptive re-use is called barely as the process of adaptation of historic buildings to today's functions for new purposes (Erdemir Türkkan, Altay, Olguntürk, & Özaloğlu, 2009). The word adaptive can be defined as "characterized by or given to adaptation"[3]; "having an ability to change to suit different conditions"[4]. Also, the dictionary definition of reuse is "The action of using something again"[5]; "the use of something again"[6]. According to the Australian Department of the Environment and Heritage, adaptive reuse is; a process that changes a disused or ineffective item into a new item that can be used for a different purpose. Sometimes, nothing changes but the item's use (Australian Government: Department of the Environment and Heritage, 2004, p. 3).

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[3] Oxford Dictionary, http://oxforddictionaries.com , last visited on May 2017
[4] Cambridge Dictionary, http://dictionary.cambridge.org , last visited on May 2017
[5] Oxford Dictionary, http://oxforddictionaries.com , last visited on May 2017
[6] Cambridge Dictionary, http://dictionary.cambridge.org , last visited on May 2017

Like other assets in the world, buildings have a lifetime considering they designed for a period of time. With time and other different factors, the needs of owner, user or society changes and the building should fulfill those needs by the time passes. (Keymer, 2000, p. 23) In this thesis; the term adaptive re-use will be defined as: "a form of intervention to make a historic building suitable for a different function and in this way, contribute to the protection and sustainability of it". This approach emerged as a way of ensuring the preservation of buildings that were not in use, physically obsolete, misused or no longer meet today's strict standards and potentially renewable with re-functioning them. In that context, it is true to be mention Lina Bo Bardi's approach to adaptive reuse of vernacular architecture which told by Lehmann's article from "Sustainable Lina: Lina Bo Bardi's Adaptive Reuse Projects" book that;

> It's a strategy that retains the embodied energy of the existing urban fabric and exemplifies the cultural significance of these structures: keeping the existing buildings maintains the cultural identity and exemplifies the tectonic evolution of the vernacular architecture. (Condello & Lehmann, 2016, p. 56)

Altering existing buildings for new functions is not a new phenomenon. In history, structurally healthy buildings have been changed their functions and adapted for needs without questions or problems. (Plevoets & Van Cleempoel, 2011, p. 156) The action on alteration of existing buildings, theoretically established in 19^{th} century, with the idea of preserving historic monuments and with the implications of that era's leading names Eugène Emmanuel Viollet-le-Duc (1814–1879), John Ruskin (1819–1900) and Alois Riegl (1858– 1905). (Plevoets & Van Cleempoel, 2011, p. 156) The first known reuse examples are from the Renaissance and the idea of giving new use to a monumental building is only a pragmatic intention that cannot be assumed as conservation action. The intention of using a building again was mostly either functional or financial. Industrial Revolution was a turning point that leads to radical changes in foremost economy, and after socio-cultural effects, environments, and lifestyles of people (Köksal, 2012, p. 18). Until industrial revolution, because the change in urban fabric was not fast as today's change, it was common to adapt redundant and disused vernacular buildings for new purposes. As the whole socio-economic system changed radically after industrialization, at first phase demolishing old buildings became very usual and built new ones, rather than extending their life spans and adapting them for new uses (Soğancı, 2001, p. 48). In the early 20th century, re-construction became so popular during the post-war especially in Western Europe and United States. Le Corbusier who is one of the most important and influential architects in the development of modern architecture was one of the examples as a pioneer of building new rather than adapt or reuse the old ones. Although it can be seen as a reaction to cure the post-war effects on urban life, as Clericuzio (2010, p. 42) mentioned in his article, it was not a constant phenomenon after post-war period neither immediately nor universally. Besides this; as again Soğancı mentioned in 2001; industrial revolution brought also the rise of the idea of adaptation of old buildings with new uses after 1970 s in late 20th century. The term re-use was firstly used in USA and then this nomenclature spread to Great Britain and to Europe after then. As Powell (1999, pp. 9-10) wrote in his book in 1999, the very first examples of re-use took place in USA in the 1970 s. In addition to this, 40 percent of construction in Central Europe is adaptation of historic buildings rather than demolishing them and construct the new ones (Shittich, 2003). Furthermore, a parallel approach in 1970 s, conserving abandoned industrial buildings and giving them, new uses also took part at the same time. The initial aspiration about re functioning old buildings were not rejuvenating the abandoned corruption area but, attentive people who are in a quest for alternative places to move in, artists and commercial companies have transformed the field by evaluating opportunities that buildings offered. Workshops, factories, machines, ateliers, mine operation and treatment fields, warehouses, depots, energy plants, transportation areas like railways and seaports and other service structures in industrial areas can be asserted as “industrial heritage”.

2.1. A Review on Design Strategies and Related Concepts in Adaptive Re-use

Adaptive reuse of a heritage building is a challenging process since the heritage values, physical characteristics and potentials of the heritage building should be well analyzed holistically. (Mısırlısoy & Günçe, 2016) In that manner, in literature, each author defines those adaptive reuse strategies among different criteria and there are many different approaches to reusing different types of historic buildings. The beginning of publications about adaptive reuse is in 1975, Cantacuzino's "New uses for old buildings". It explains adaptive re-use and history of it by also giving a selection of examples from world according to the type of building before the changing function. From that publication to today's understanding of adaptive reuse some several approaches and strategies have been examined in architectural discourse. As it was stated by Cleempoel and Plevoets; (2011, p. 157) in contemporary theories on adaptive reuse, a typological approach, technical approach, and architectural strategy approach are the categories of reuse strategies defined by different authors.

In the process of the creation of all those strategies, authors define the criteria for selection of the cases which they want to focus on. One by one; the expansions of those terms are: firstly, a typological approach that classifies buildings in accordance with their functions before or after transformation. The main focus of this approach is the drawbacks and opportunities towards reuse of each typology, and it is mainly the way of classification of the written sources. (Table 2.1)

Table 2.1 Classifications According to the Typological Approach by Cantacuzino (1975) (Plevoets & Van Cleempoel, 2011)

INDUSTRIAL BUILDINGS	RELIGIOUS BUILDINGS	(SEMI-) PUBLIC BUILDINGS	RESIDENTIAL BUILDINGS	MILITARY BUILDINGS	COMMERCIAL BUILDINGS
FACTORY	CHURCH & CHAPEL	CITY HALL	CASTLE	FORTRESS	CRAFT SHOP
WAREHOUSE	CONVENT	MUSEUM	COUNTRY HOUSE	BARRACK	DEPARTMENT STORE
BARN	BEGUINAGE	SCHOOL	FARM	GATE	EXCHANGE
GRANARY	PRESBYTERY	HOSPITAL	TOWN HOUSE		BANK
MILLS		OBSERVATORY			MARKET
BREWERY		COURT HOUSE			BOUTIQUE
MALTING		OFFICE			PASSAGE
MINING SITE		LIBRARY			
RAILWAY STATION		THEATRE			
		HOTEL & HOSTEL			
		POST OFFICE			

Table 2.2 Technical Issues List Raised by Technical Approach on Adaptive Reuse (Plevoets & Van Cleempoel, 2011)

<table>
<tr><th>UPGRADING</th><th>LITERATURE</th></tr>
<tr><td colspan="2">LOAD-BEARING STRUCTURE</td></tr>
<tr><td colspan="2">FRAMES (Timber Structures, Iron Structures,...)</td></tr>
<tr><td colspan="2">FLOORS</td></tr>
<tr><td colspan="2">WALLS</td></tr>
<tr><td colspan="2">ROOFS</td></tr>
<tr><td colspan="2">UNDERPINNING</td></tr>
<tr><td colspan="2">HEAVY- LIFTING</td></tr>
<tr><td colspan="2">BUILDING ENVELOPE</td></tr>
<tr><td colspan="2">INTERNAL SURFACES</td></tr>
<tr><td colspan="2">INTRODUCTION OF NEW FLOORS</td></tr>
<tr><td colspan="2">FACADE</td></tr>
<tr><td colspan="2">ACCESSIBILITY AND CIRCULATION</td></tr>
<tr><td colspan="2">COMFORT, SAFETY AND ENERGY EFFICIENCY</td></tr>
<tr><td colspan="2">FIRE-RESISTANCE</td></tr>
<tr><td colspan="2">THERMAL PERFORMANCE</td></tr>
<tr><td colspan="2">ACOUSTIC PERFORMANCE</td></tr>
<tr><td colspan="2">PREVENTING MOISTURE AND DAMPNESS</td></tr>
<tr><td colspan="2">INDOOR AIR QUALITY</td></tr>
</table>

Secondly, the technical approach stresses the concern of interdisciplinary aspects of reuse, including conservation, architecture, interior architecture, planning and engineering which suspicious about technical issues for all those titles. (Plevoets & Van Cleempoel, 2011) This kind of literature anchor mostly on how intervention should have done to allow building a new function.(

Table 2.2)

Finally; the strategic approach focuses on the applied architectural operation and the design strategy for converting compelling buildings. This approach and concept can vary in different dimensions as the design strategy and physical intervention rate changes. Within the framework of this approach, some design strategies defined and there is an analogy between the defined strategies of different designers that find their ways in architectural discourse. (Plevoets & Van Cleempoel, 2011)

Table 2.3 Strategic Approach which Establish Analogy Between Design Strategies and Their Expressions on Architecture (Plevoets & Van Cleempoel, 2011)

<table>
<tr><th colspan="4">DESIGN STRATEGIES</th><th>ARCHITECTONIC EXPRESSIONS</th></tr>
<tr><th>ROBERT 1989</th><th>BROOKER & STONE 2004</th><th>JAGER 2010</th><th colspan="2">CRAMER & BREITLING 2007</th></tr>
<tr><td>BUILDING WITHIN</td><td>INSERTION</td><td>TRANSFORMATION</td><td>MODERNISATION</td><td>CORRESPONDANCE</td></tr>
<tr><td>BUILDING OVER</td><td></td><td rowspan="3">ADDITION</td><td rowspan="5">ADAPTATION</td><td rowspan="4">UNIFICATION</td></tr>
<tr><td>BUILDING AROUND</td><td rowspan="3">INTERVENTION</td></tr>
<tr><td>BUILDING ALONGSIDE</td></tr>
<tr><td rowspan="2">ADAPTING TO A NEW FUNCTION</td><td>CONVERSION</td></tr>
<tr><td>INSTALLATION</td><td></td><td>JUNCTION AND DELINATION</td></tr>
<tr><td>BUILDING IN THE STYLE OF</td><td></td><td></td><td>REPLACEMENT</td><td></td></tr>
<tr><td>RECYCLING MATERIALS OF VESTUGES</td><td></td><td></td><td>CORRECTIVE MAINTANANCE</td><td></td></tr>
</table>

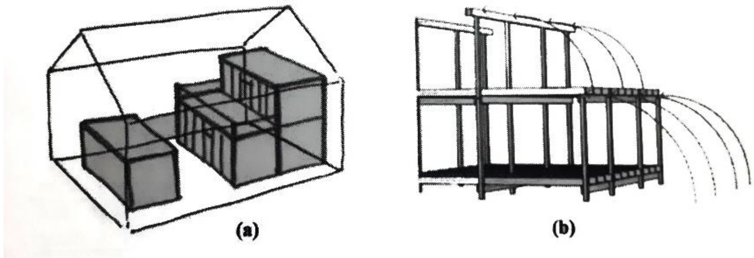

Figure 2.1. The Concept of “Envelope within an Envelope” and Modular Timber Framing Used in Michigan Barn.

Apart from these categorizations, adaptive reuse basically divides into two as; direct intervention to building and indirect intervention with additional structural elements without altering the building. Condition of building, location, given function to the building, the needs of this new function, needs of inhabitants and local society are some of the important factors while deciding on those types of interventions on buildings. The first type constitutes direct intervention to building which includes structural repairs, alterations, and maintenance with also changes in building program with reference to the regenerated function. As these touches, can go between breaking the original authenticity of the building or revitalizing it, the authenticity of former design should not be ignored entirely for the sake of the designer’s intentions on the new design (Soğancı, 2001). The second intervention type is the indirect intervention to the building which the new piece has an identity injected into the building. This approach as intervention type has been applied in many research and application projects as a design strategy and has been named several different times by different researchers in the literature. Different possible ways are existing in that kind of a re-architecture or with different words remodeling process as presented by Philippe Robert (1989). He named those types as; *“building within”*, *“building over”*, “*building around”*, *“building alongside”*, “*recycling materials or vestige’s*, “*adapting new function”* and *“building in the style of”*. His definitions are also defined by diverse authors in different ways and in many cases, they coincide with each other. In this thesis; similar approaches which interested in injecting new structures inside a heritage building will be focused as intervention strategy. With respect to Robert's definitions; those approaches are overlapping with the **"building within"** approach.

Brooker and Stone (2004) mentioned in their books about intervention actions and they use the term **"insertion"** for the introduction of a new element into, between or beside an existing structure. They specify some necessities about the host building; to be sufficiently powerful, relatively physically unaltered. As design concept, in 2007 in Frattari and Lawrence's article, this approach mentioned as **"envelope within an envelope"**. This design strategy gave the priority to prove that permitting innovative technology to provide sustainable and modern accomodation is economically viable with traditional conservation and preservation interventions. (Figure 2.1) It offers this strategy in Michigan as a facility management goal in which situations, the preception in the conversion of redundant barns is a complex process and extravagant (Frattari & Lawrence, 2007).

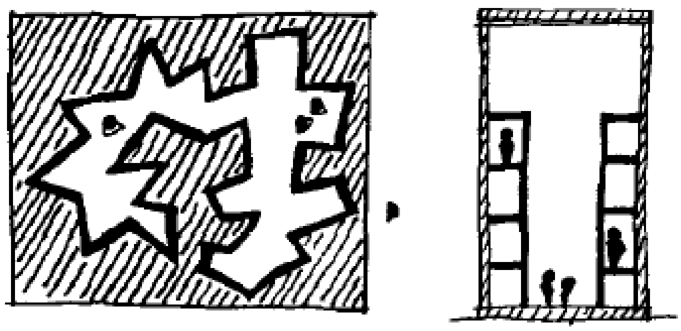

Figure 2.2. Conceptual Drawings of Libeskind and Bo Bardi's Adaptive Reuse Examples (Mundey, 2009, p. 20)

In 2009 by Rikus Louis Mundey, researched to investigate various approaches to formal, spatial and programmatic transformations in his thesis to reform an adaptive re-use approach called **“layering”**. In that research, integration of a new structure inside an existing historic building called **“building into”**. He investigates two examples of different architects' interventions relating to this approach: Daniel Libeskind’s Danish Jewish Museum in Denmark (2002-2004) and Lina Bo Bardi’s Teatro Oficina in Sao Paulo, Brazil (1980-1991) (Figure 2.3). In both cases, the intervened buildings lost their interior integrity, but their facade integrity is still existing. In Libeskind’s project, inserting the historic boathouse, a maze alike structure dominates the space and break the relation of existing references. Lina Bo Bardi’s conversion of the simple garage into a theatre is similar in conceptual nature with addition of infrastructure but it is far from the conservation context.

The same naming was used as **“insertion”** by Bollack in 2013 like Broker & Stone (2004) did. (Bollack, 2013) Bollack is grouping interventions into 5 as; insertions, parasites, wraps, juxtapositions, and weavings (Figure 2.4).

Figure 2.3. Images 1&4: Daniel Libeskind’s Jewish Museum in Denmark. Images 2-3-5: Lina Bo Bardi’s Teatro Oficina in Sao Paulo, Brazil

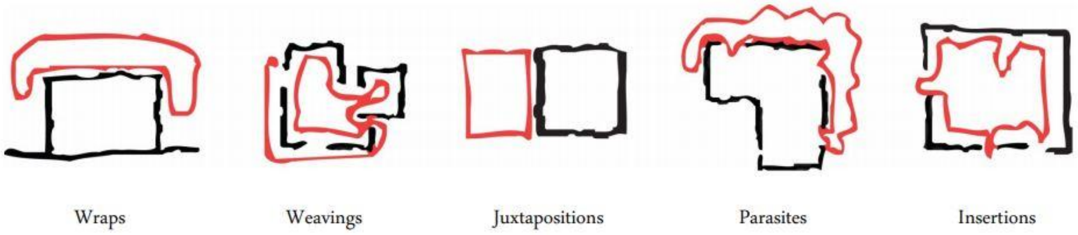

Figure 2.4. Bollack's Sketches About the Interventions Types Defined in Her Book (2013)

The definition made in this book about the term "insertion" is directly reflecting the present situation in Ayvalık. According to Bollack, in this group interventions, the newly added piece or space which has its own identity is using the existing structure as protection and nestling in it. In the end, the existing building is becoming a living contemporary object and the long term preservation is ensured with this intervention.

All over these definitions and descriptions; in the scope of this thesis; the strategy will be defined as **"depot building as a shell structure upon the new insertion for different flexible uses"**. It is mentioned in the evaluation part of this thesis in Chapter 4 the inferences gathered from adaptive re-use and the investigated case studies, will be combined with those physical survey results.

2.2. A Design Solution: Proposal of Modular Design for Adaptive Re-Use

From the beginning of building shelters, primitive huts as a matter of function through the pyramids and ancient buildings of Rome or Greece, building activities have been carried out as in-situ which means on-site construction. Until the 20th Century, the inexpensive labor and extensively large programmed scopes were used for the benefits of investors but, as time passed, as humanity evolves in that time, technologies and construction techniques that are built with the change with the direction of labor also showed improvement (Smith R. , 2010, p. vii).

Modular design is one of the design solutions for many different interdisciplinary complex system designs like mechanical engineering, computer programming, architecture, interior architecture and product design for combining the advantages of standardization. As the prefabrication has evolved after industrialization period, prefabrication and modularization of architecture also improved as a result of necessities and desires of the communities. To seek to produce higher quality and more affordable architecture became the main question of the countries which were, one step ahead in mass production. At the same time, development of logistics and transportation had allowed off-site manufacturing and assembly, so the design processes of architects and designers were changed among those aspects.

In this section, firstly the definition and the aim of this design discipline called modular design, the module and the term modularity are identified. The creation process of the idea of standardized measurements and proportions are evaluated within the general historical context. After giving this general historical context about the seek for standardization, a review in industrialized and prefabricated buildings composed of modules is made. The application process of the modularity is being explained with its branches; principals, fundamentals and elements of modular/prefab architecture. In conclusion, introduction of modularity as an adaptive re-use solution is introduced within the context of the functional requirements advantages and disadvantages it provides.

When researching modular design, information's from a set of different branches about modular design are available and when looked at the definitions by different areas, definitions don't change according to the defined area. It is a term used in computer science, design engineering, art, construction of homes and other systems. (Gershenson, Prasad, & Zhang, 2003) In Russel's (2012, p. 260) article about the interdisciplinary history of modularity concept, he examines the concept of modularity in different settings and he looked on different professionals who adopted and adapted the general principles of modularity. For looking through from his perspective, the essential thing is first defining the "module" which is the component of modular design. It is important to define being "modular" at first.

In dictionary definition[7]; the word modular as an adjective is “employing or involving a module or modules as the basis of design or construction.” According to Oxford University Press Dictionary[8], the origin of the word which means ‘allotted scale’ and ‘plan, model’ is coming from 16th century French or the Latin word ‘modulus’ and the current senses about it dated back to 1950 s. The same dictionary divides the definition of the word “module” into two distinct categories with sub-categories. The first category which is the first that comes to mind; describes the general use in the construction of a complex structure such as an item of furniture or a building. The subgroups of this category are very different uses in different study areas. The first-sub-category refers to the independent units of study or training when combined forms a course or a complex system like ‘law module’ and the second sub-category refers to the use of the term “module” in computing area exemplified as ‘a networking module”.

This definition is similar with the mentioned in Russel’s (2012, p. 261) article “a component of a larger or more complex system.” from Oxford English Dictionary and he points out that; in works of evolutionary biology, pedagogy, military strategy, and prosthetics these meanings of the module were used. In addition to this; in second category, a “module” is defined as a detachable self-contained unit of a spacecraft in Oxford University Press Dictionary. As can be seen; the traces of the modular idea spread through to different discourses and practices.

It should be mentioned the modular design definition after the definition of “module”; the term modular design attributed as: “Designing products by organizing sub-assemblies and components as distinct building blocks (i.e., modules) that can be integrated through configuration to fulfill various customer and engineering requirements”. (Tseng, Wang, & Jiao, 2018, p. 3)9 This organization leads to

[7] https://en.oxforddictionaries.com/definition/modular
[8] https://en.oxforddictionaries.com/definition/module
[9]https://www.researchgate.net/publication/323834472_Modular_Design/link/5aadf14ea6fdcc1bc0bae76e/download

disintegration of complex variation of systems into simple modules to reach efficient designs and end products.

Apart and before from literature researches and definitions, the seek of a standardized scale and the use of module has been existed worldwide. As mentioned beforehand, this term coming from the Latin origin “modulus” was first seen in the book of Vitruvius (The Ten Books on Architecture, 1960) and it was in use among Roman architects and after then Italian architects with Italian Renaissance used this proportion system in some parts of the classical orders. A page from Book IV, from Ten Books on Architecture shown in Figure 2 5 is a drawing that shows the proportions according to the semi-diameter of a column.

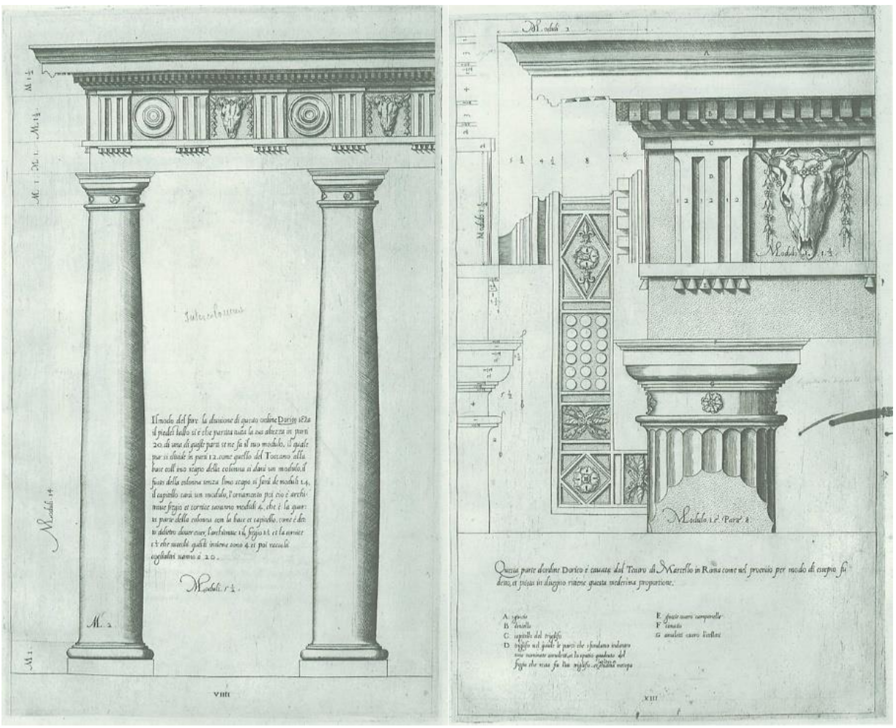

Figure 2.5. Images taken from the “The Ten Books on Architecture” showing modules as proportion measurement elements used by architects. (http://www.vitruvius.be/vignola3.htm)

As similar respect, tatami mats from Japanese architecture which belongs to mid 16th Century is again a traditional use of spatial proportion measurement. According to Hoffman (2012, p. 1), the rooms called ‘zashiki’ proportioned by the located tatami mats as modules and the sizes of rooms thereafter measured by how many tatami mats could fit there; a typical room was 4.5 mat, and the placement of the mats depended on what the room was used for.

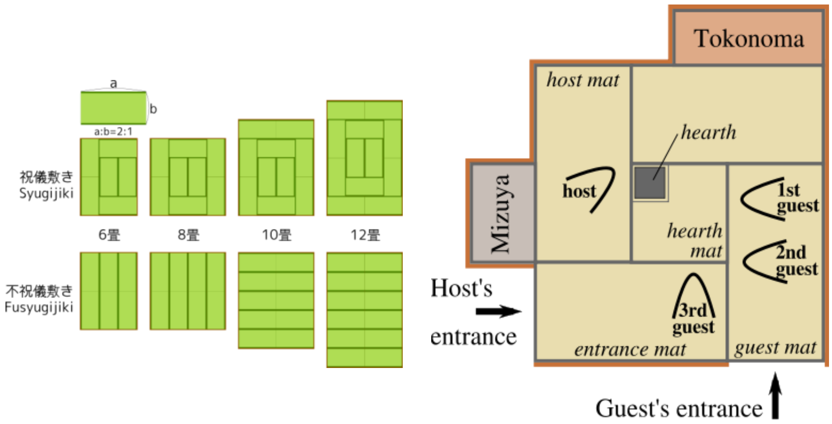

Figure 2.6. Images showing layout schemes of tatami mats used as modules from Japanese Architecture (Boy, 2008) (Ignis, 2016)

In 1948 modernist architect Le Corbusier released his book Modulor; and the predicted that the proportional grid would be a universal norm in all construction practice. (Arellano, 2018) He was offered a new proportioning system that standardizes architectural and mechanical products. Referring to the human scale and golden ratio found in nature, he suggested a universally applicable grid measurement system. This search of harmonious proportioning reflects on the application as designing door handles, furniture, building and also urban spaces (Figure 2.7). Accordingly, it is important to put a remark on the “standardization” term with respect to Le Corbusier’s approach which is actually not the subject of this thesis. Standardization is a significant element of modular design that leads the designing and manufacturing processes of the modular product and that should get its roots by not the industry but by the human body. In the scope of this thesis, the part that is raised is a complex system be composed of modular components. In that context, below the literature of the studies made upon modularity and modular design reviewed.

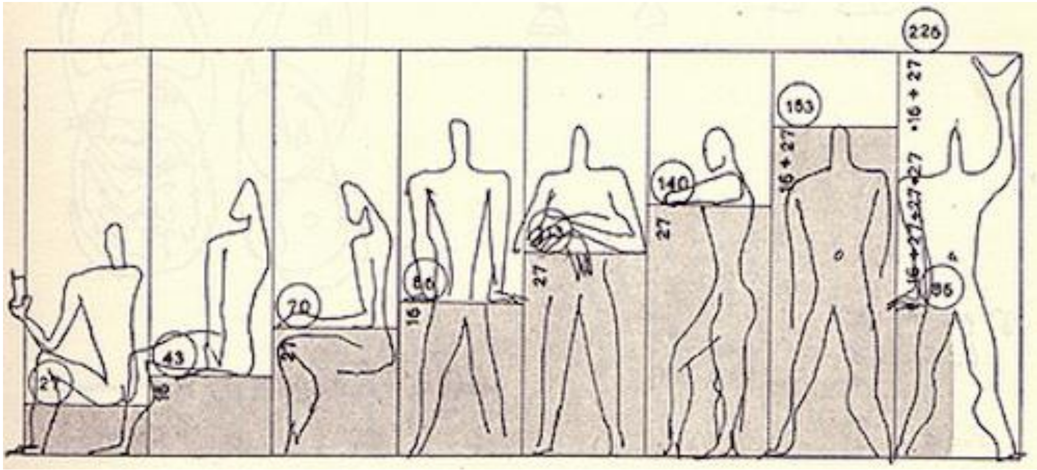

Figure 2.7. Le Corbusier's Proportioning in Modular Based on the Human Body and Functions (https://www.versobooks.com/blogs/3034-le-corbusier-s-ideal-is-a-barracks)

Mentioned by Tseng, Wang & Jiao; the concept "modular design" first introduced by (Starr 1965) as a new way to develop a variety. (2018, p. 3) With this organization style it was aimed at making some modifications in small modules and not decompose the whole manufactured infrastructure. Besides the conceptualization; one of the first researchers about modularity are Ulrich and Tung (1991). They were the first to discuss the potential costs and benefits of modular architecture, to depict common formats to achieve modularity. In addition; they were the first to ask questions about the future effects of modularity. (Smith R. J., 2009). And after 12 years; Gershenson, et al. (2003) wrote the combination of diverging definitions from different use areas with giving citation to Ulrich and Tung (1991). In their article; they cite also from other researches which are; Chang and Ward (1995), defending the idea modularity combines the goal of modular design with the idea of conceptual robustness and Sosale, Hashemian, & Gu (1997), relate modularity with the compatibility of recycling of the used materials. After reviewing the literature, Gershenson, et al. defined three fundamental elements to modularity not far away from Ulrich and Tung's definition as;

> Upon reviewing the literature, consensus is found in some areas but few definitions of modularity have reached for the full benefits of product modularity. We believe that the full benefits are realized when a module is a grouping of components that are similar in the life-cycle processes they undergo, and independent from all components outside of the module as they go through their life-cycle. There are therefore three fundamental elements to modularity: the independence of a module's components from external components, the similarity of components in a module with respect to their life-cycle processes, and the absence of similarities to external components. (2003, p. 303)

Almost like the dictionary definitions; their definition of modularity is independent of function. Although they defined it as a design goal, the definition can be used in different studies as an approach.

Likewise, it can be said that modularity has some degrees which start from the proportioning system before manufacturing and it can increase step by step till the end of designed prefabricated module as end product. It can be classified with respect to the number of grouped manufactured components before the assembly (Figure 2.8). A module can be a single material, a component formed by a material, a panel formed by a finished form of a component or a module formed by finished forms of a panel. As mentioned by Smith (2010, pp. 127-128), those terms "component", "panel" and "module" are not standard names in the industry but they referred to an organizational

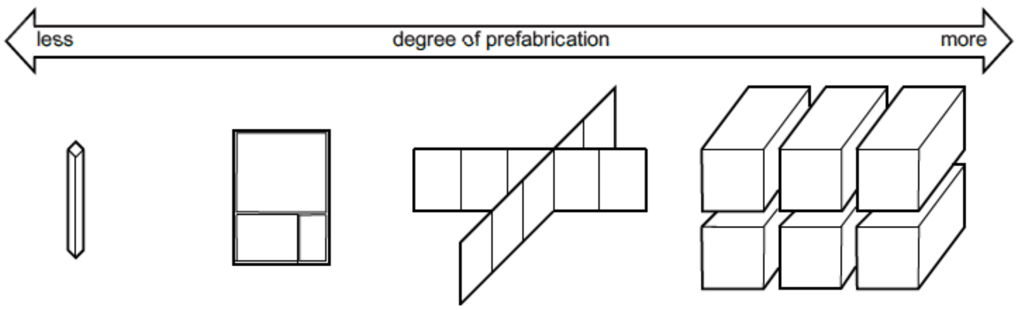

Figure 2.8. Figure Showing Completed Degree of Prefabrication Prior to Assembly which Affects Manufacturability and Easy Assembly On Site (Smith R. , 2010).

method to describe the degree of end state of the manufactured good. The fundamental principles of modular design are not much different than a standard architectural or product design process. It covers some organizational, technical, and constructional categories. At first, the decision making of the material is important. To use the economic advantages of modular design principle, using local material or easy transportation is important.

Material selection among wood, metal or composite materials like concrete is changing according to the project that will be designed and installed. The durability of the material and suitability of it with the project are important points while giving decisions about material used. Although material and finishes are affecting the possible geometry of the design, the used machines, tools, and the manufacturing process are also developing prefabricated modular elements. With respect to those fundamentals mentioned above, organizationally using a grid system that allows elements to have standard dimensions is mostly seen in modular prefabricated buildings, furniture, and products. Like in any design process, getting references from a grid system is a starting point for also modular design especially because standardization is the key element of this type.

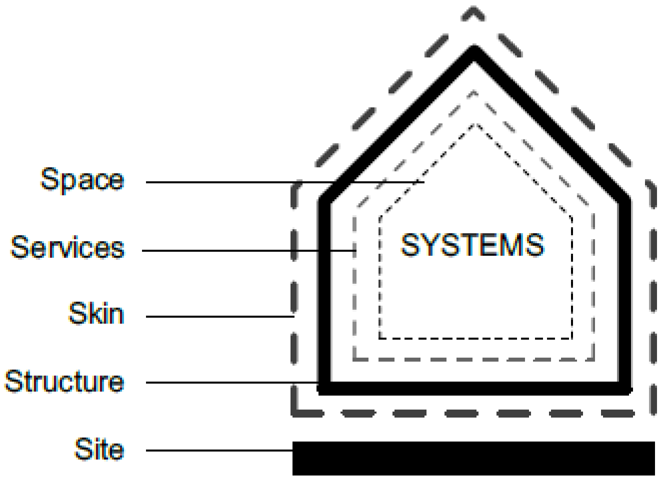

Figure 2.9. Layered System Organization Chart (Smith R. , 2010)

Another fundamental is the “system” of construction which made up of layers. The level of construction from those layers are changing site by site and from design to design. The general concept in that manner is, whenever designing modular, there should be a system that is confronting the level of needs at the site. For example, in our case in the scope of this thesis, structure is the beginning layer and services and space are following it in the hierarchical order.

Moreover, functional requirements which dependent on use and architectural type of building are the points leading the design. According to Lawson, Ogden, & Goodier (2014), functional considerations may be varied into two areas. The performance and the regulatory requirements depents on use and architectural form of building. Those requirements can be collocated as; structural, thermal, acoustic and fire resistance requirements. Table 2.4 showing functional requirements for modular buildings which at some points may valid for new modular insertion inside the shell structure which examined in the scope of this thesis. Those mentioned 8 requirements in Table 2-1 are derived as the assessments which should be considered as design requirements for the new insertion.

At that point mentioning the advantages of the use of modular design is a necessity besides the functional requirements. From many of them, the first one is easing the project management by minimizing the complexities to deal with. The more the degree of the module prefabricated outside the site, the more the benefits can be realized. To be clearer, looking from the efficiency perspective, the greater degree of finish is minimizing the spent time and increasing the feasibility of a project. It also increases the level of accuracy and quality of the end product. In addition to this another advantage joining modularity in design is provision of high product variability and flexibility (Hölttä-Otto, 2005) Although modularity brings standardization of components, it ensures a range of flexibility and compliance to different needs in architecture. The lifecycle of the end product is longer as, by the time, standard components can be renewed without affecting the rest of the system.

On the contrary, modularity may lead also some drawbacks. The fact of over design may show up in some cases. This may also lead to loss of efficiency which opposes the starting point having more efficient design with high degree of accuracy and quality. In addition to that, the design identity may have lost by the repeated common modules. This will result in similar imaged products with not having a story to tell.

When information gathered from the above-mentioned requirements, advantages and disadvantages, in the case of Ayvalık depot buildings the use of modularity as an adaptive re-use strategy is adding a new layer to the concept of conservation of those industrial buildings. Without losing the embodied energy of the existing building, the first layer which is reusing those buildings as a shelter with the newly added insertion is strengthened with the second layer of modular design decision. Using the advantages of modular design, the adaptive re-use strategy is expected to strengthen in terms of performance.

Table 2.4. Functional Requirements for Modular Components (Lawson, Ogden, & Goodier, 2014)

Functional Consideration	Comment on Modular Construction
Plan Form	Dependent on module size, the strategy for stability, and issues such as fire evaluation of the building. Additional braced cores are often required for taller buildings.
Circulation Space	Means of access to the modules require design of corridors or external walkways, and braced stair and lift cores
Cladding	Cladding may be in the form of ground-supported brickwork (up to three storey high) of lightweight cladding. In both cases, the cladding ormally attached to the modules on site. The modules are designed as watertight insulated units.
Roofing	Roofs may be manufactured as modules, or using conventional roof trusses. Flat roofs are not normally reccomended in modular construction unless provision is made for water runoff in the module design.
Thermal Insulation	High levels of thermal insulation are generally provided within the modules, which can be supplemented by additional insulation on the outside of external walls.
Acoustic Insulation	Double-layer walls, and combined floors and ceilings, provide excellent acoustic seperation.
Fire Safety	90 min fire resistance is generally achieved by the measures for acoustic insulation. 120min fire resistance is achieved by additional boards. Fire spred between the modules is prevented by use of fire stops.
Services Distribution	Modules are generally manufactured as fully serviced units, and service connections are made externally to the modules. Corridors provide useful zones for service distributions.

2.3. Case Studies

In this section based on the previously obtained information, eleven case studies were selected from Turkey and from the World. three of them are the examples from Turkey and eight of them which is more in number are from different parts of the world especially Europe. Mostly details about design strategy of case studies taken into account rather than buildings original functions to prevent the restriction of example types but there are also examples which their functions are related to depot buildings. To be able to evaluate the cases selection criterions were considered as below:

1. Is the building treated as a shell structure upon the insertion?

2. Is the insertion designed in a modular design manner?

3. Are there any flexible characteristics in the inserted design?

The selected examples are not always complying with all those three criteria but the first criteria in all cases are the most important one for the selection of the case as an example to support this thesis. Cases are selected according to the applied intervention and design strategies which "treating the existing building as a shell structure" so they were selected not by the building type they were being part of.

For each case, general information about the site and project has been mentioned, the design proposals for the existing structures have been defined and the advantages and disadvantages of the implementations will be evaluated. In conclusion, what was learned from this case study will be expressed.

As a conclusion of this part, looking through the reviewed case studies and all assessments made one by one, the driven principles are voiced. Those principles lead to the principles to conserve Ayvalık depot buildings and modular design decisions in Chapter 5.

2.3.1. Cases from Turkey

1| Abdullah Gül University, Sümer Campus, Re-use of a Warehouse of Sümerbank Textile Factory Complex, KAYSERİ

The warehouse is located in Kayseri, between many factory buildings of the Sümerbank Textile Factory Complex. This complex is one of the important and preliminary examples of Modern Architectural Heritage of Turkey designed by the architect Ivan Nikolaev and built-in 1935. The complex passed from a period of abandonment after the privatization of it in 1999 and assigned for the use of Abdullah Gül University in 2012. The original function of the warehouse building designed as a high single-story space used for storage and a lunch hall which transformed in 1970. It has a rectangular plan type that is long and narrow in shape.

The structural system of the building structured with mixed use of stone masonry walls and concrete frame system. It is located on an approximately 6000 m² area with 135 x 45 m dimensions. In the campus adaptive reuse project, this building was designated as the first step of the projects and the given function to it, is an educational use for

School of Architecture which includes lecture rooms, studios, study areas, a cafeteria etc. The design project was completed by architects, Burak Asiliskender and Nilüfer Baturayoğlu Yöney in 2014 and the application of the project ended in 2016.

The design proposal was based on the preservation of the existing building and

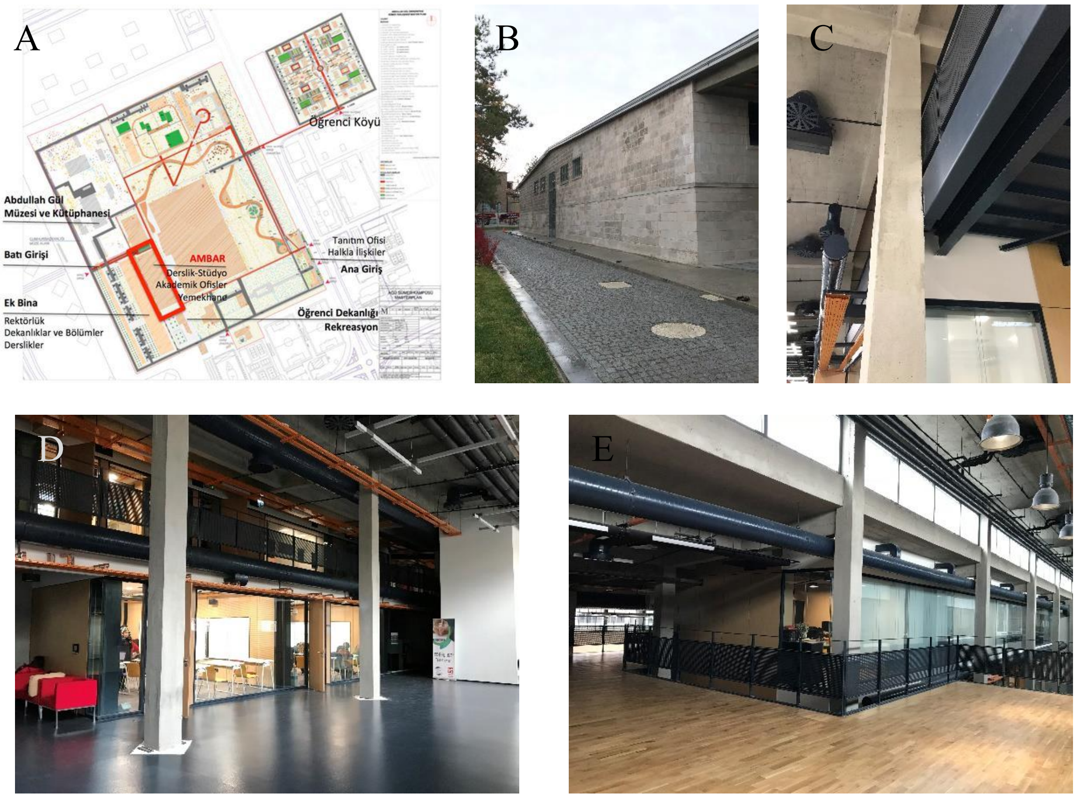

Figure 2.10. Image A: Layout Plan of the Warehouse Building Inside the Campus, Image B: Exterior Façade of the Warehouse, Image C, D, E: Confrontation of the New Intervention with the Existing Building Stem.

inserting the new freestanding boxes for new spaces. Those new spaces are the classrooms on the ground floor and faculty offices on the upper floor. They were designed in a reversible manner with a removable structural system composed of steel-framed boxes with timber flooring and panel partitions. Those free-standing boxes were standing separated from existing concrete columns in one part of the building which are more readable and on the other part of building columns are on the same line with lecture rooms façade. (Figure 2.11) Circulation on the upper floor provided by steel bridge systems connecting different boxes on different sides. The original building was also intervened in the re-design of the project in order to obtain new door openings on the longitudinal façade and also some lost parts of the stone masonry walls were reconstructed as glazed facades to provide more natural light to interiors.

In addition, the original flooring was changed and an epoxy like resin material covered the whole area which includes circulation areas on ground floor. The lunch hall is

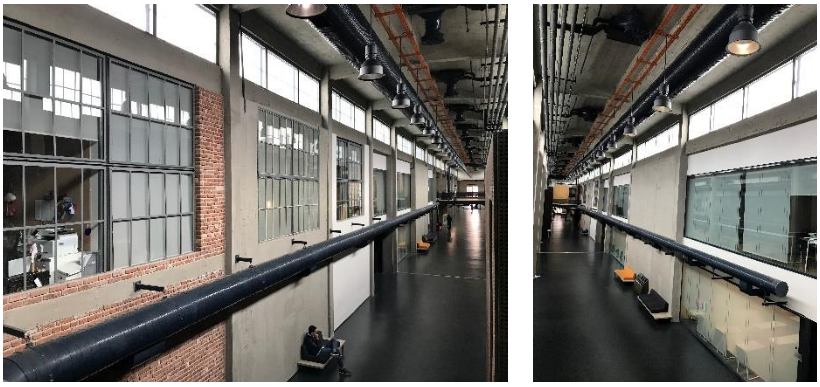

Figure 2.11. Left: Existing Façade with Small Façade Interventions, Right, New Insertion Between the Existing Structure.

redesigned as a cafeteria with again insertion of a new box, functioned as a kitchen and differentiated from other boxes with different metal covering.

The insertion occupies approximately 80 % of the whole building and it has two storeys as mentioned before, which is for the optimum use of the height of the building. The goal tried to be achieved in this design proposal is the use of the existing building as a shell structure to the new free-standing boxes. Those self-load bearing structures which only anchored to floor were used to provide less intervention to the existing modern heritage building from 1935.

With this project, some advantages have been gained, which can be exemplified as decrease in the construction cost and maximization of the available use area to provide more functions and spaces. As a result, this insertion occupies as a two-storey building that has convenient space for every given function which is important for the sustainability of building and its environment. On the other hand, some disadvantages also were created with the new intervention. Although the implementation goal of the self-standing boxes was re-using the building as a shell on them, on some parts the insufficiency of the connection or disconnection between the existing building and new addition breaks the link between design idea and implementation. It changes the spatial perception as if boxes are not designed separated from the existing columns but between them and the same-face finishing with the existing pattern from ground to top obscures the differentiation perception of old and new.

As learning from the project, the importance of the stiffness and healthiness of the building structure can be given. After a long time of abandonment period, unlike most of the buildings, this building structurally has fewer problems so, it is important in decreasing the intervention costs in re-use of buildings. Second learning from this case is the sustainability of the building which is the goal of the intervention was accomplished by inserting new structures in it. Building treated as a shell structure upon new additions so that it continues to represent its own life period.

2| Beyazıt State Library, Renovation Project of the State Library and Imarethane, ISTANBUL

The Beyazıt Public Library is located in Istanbul, Beyazıt Mahallesi in Fatih district. The establishment of the library is dating back to 1884 which founded as the re-use of the spaces soup kitchen and Caravanserai. The library is a section of Kulliyah of the Beyazıt-Mosque which surrounds and defines the historic Beyazıt Square. The project of the renovation includes a conscious re-organization of the interior and restoration of the building with its important multi-domed roof. Tabanlıoğlu Architects are the architecture firm has embarked on the restoration works of Beyazıt Library in 2015 and the project architects are Melkan Gürsel, Murat Tabanlıoğlu (Archdaily, 2016).

As mentioned, this is a restoration project which means intervention to the whole building. As seen in the plan scheme, the building consists of some small rooms and halls. (Figure 2.12) Although design proposal "minimal intervention" approach acquired as principle, there were also some problems of the building which should be solved and restored, for its sustainability. Tabanlıoğlu architects installed a light and transparent membrane structure in place of the former concrete roof to the none domed part and apart from this renovation; building was kept as a shell structure upon other

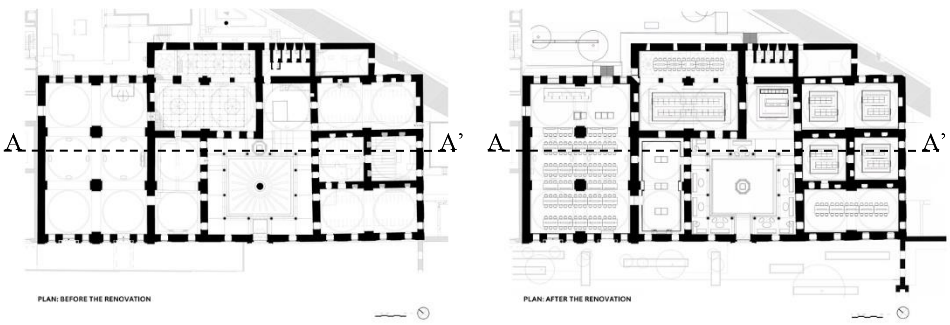

Figure 2.12. Layout Plan of the Beyazıt State Library; Left: Plan Before the Renovation, Right: Plan After the Renovation (Archdaily, 2016)

functions. Black glass boxes that stand as monolithic elements at the center of different sized rooms are dedicated to storage units of original manuscripts. (Figure 2.14) For other functions, non-architectural elements were used like exhibitions and studying spaces. The circulation flow through the building was changed according to optimize it to its contemporary function and an extension that has a respectful scale in comparison to existing buildings northeast façade has been added. Their design goal in this respect is; intervening less on the historic pattern of the interior to sustain its spiritual authenticity while injecting modern facilities in it.

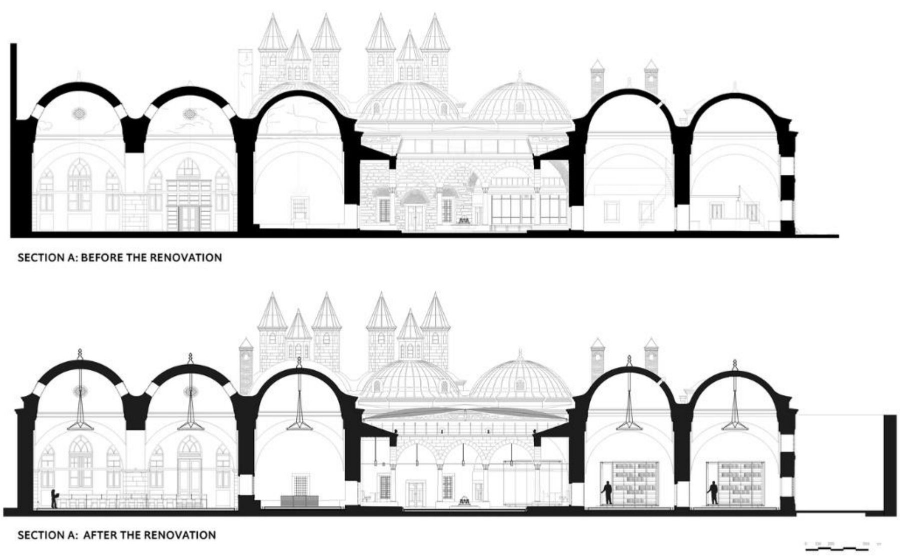

Figure 2.13. Section A from the Beyazıt State Library; Up: Section A Before the Renovation, Down: Section A After the Renovation (Archdaily, 2016)

Inserted monolithic boxes are occupying approximately 80% of the space that they decided to be applied to. They are one storey insertions and apart from those elements, design completed mostly with sensitively designed lighting elements in the whole interior area. (Figure 2.13) As designed boxes are the storage units of original and rare manuscripts and documents, controlling natural light and ventilation are major points affecting the design ideas. Designers decided black glass use, for providing transparency and light control at the same time. Using raised flooring, ventilation of the boxes and the climatic issues about the manuscripts were solved. In addition to this, structurally, the load-bearing elements are tempered black glass and for their ceiling, a steel grid system with tempered glass was used which creates the general frame of the boxes. It can be said that system composed of different elements can bear its own load without any other load-bearing system.

For evaluating inserted design elements, focusing on advantages and disadvantages to the related area is distinctive. For a historic place like that, designing a box-like element available to disassemble and reuse can be evaluated as a good example among other implementations. In spite of that fact, it is an advantage to make this building

Figure 2.14. Images from Beyazıt State Library after Renovation with Monolithic Box Insertion. (Archdaily, 2016)

usable after a long period of abandonment, after the 1884 earthquake, with fewer intervention principles. The only disadvantage as a design drawback is losing the possible usable areas inside the rooms which boxes assembled in them. Those monolithic elements rule the whole room with their massiveness, so designing them as separated elements created some lost usable area as circulation in rooms needed to be solved around them.

In conclusion, what was learned from this case study is for not losing the architectural spirit of space, keeping the used elements simple is an important thing. Eventually, while designing, for achieving design goals some drawbacks can be taken as risks like in this case, losing some usable space brings less intervention to the building.

3| Kasımpaşa Tuz Ambarı, Re-use of the Salt Warehouse as an Office Building, ISTANBUL

The salt warehouse is located in Kasımpaşa district near to the historical city center on the European side of Istanbul, Turkey. It is an industrial building registered as 2nd group historical building and in 2008 after a period of abandonment adaptive re-use project prepared by Erginoğlu & Çalışlar architecture firm (Büyükarslan & Güney,

Figure 2.15. Ground Plan of Kasımpaşa Salt Warehouse Renovation Project (Büyükarslan & Güney, 2013).

2013, p. 48). The new function given to this building is an office space with inserting new structures that can be accepted as a reversible approach.

The salt warehouse is a part of a complex which includes Kasımpaşa Flour Mill, a hangar and a sales unit built in the 19th century. According to Büyükarslan and Güney, in J. Pervetitch's plans it is a quadrilateral symmetric stone masonry building with a gable roof, contemplating the functional requirements and aim of its construction (2013, p. 49).

The stone masonry walls of the building are rising up to 10 meters. Planimetrically, the building having a huge volumetric mass has many division walls which separating, galleries, depots and corridors. At backyard there is a courtyard, the only space having a relationship with outside. The project made upon the existing plan scheme and nothing changed among original plan arrangement.

For achieving conservation of the original plan scheme, the design proposal was prepared according to those restrictions. Spatial insertions made with inserted structures that have a load-bearing steel frame system. Their spatial divisions are

Figure 2.16. Left: Interior of Kasımpaşa Salt Warehouse Before Conversion to an Office Building, Right:Interior Look of the Mezzanine Floor after the Conversion of Salt Warehouse (Büyükarslan & Güney, 2013).

provided with the glass material and mezzanine floors where needed are provided upon newly in-situ constructions. Those materials were chosen, for their stiffness, translucency and low weight (Büyükarslan & Güney, 2013, p. 51). The design goal wanted to be achieved is making it suitable for reversible intervention with the new formation inside. With new functional additions, open office stations, an entrance and welcoming area, meeting rooms, accountant office, wet spaces, and a cafeteria were added to the spaces previously used as depot areas. All of them are independent units that don't have any relation to the existing building. The original plan scheme doesn't change, but some interventions made for repairing damaged parts of walls and for the needs of building like ventilation. All technical elements about ventilation are solved with the needed repair of roofing and exposed ventilation pipes and equipment were used as a design decision. Apart from those interventions, floor covering of the building in circulation areas has changed but, the inserted structures are only anchored to floor which doesn't add an additional load to the existing masonry load-bearing walls. As seen in the section A-A' in Figure 2.17, steel-framed structures are standing between existing masonry walls, without losing usable area they only stand next to them. With the addition of mezzanine floors, presently available areas were used in an optimized way and maximum efficiency has taken. Because insertions made in all spaces in the building, it almost occupies 90% of the total available space except the circulation areas needed on the ground floor.

As mentioned beforehand, the main goal wanted to be achieved in the design proposal is, without having much intervention on the structurally healthy building, maintaining an insertion with light constructive elements made of steel and glass which carries its own load and optimizes the available use area. This approach brings the advantage of

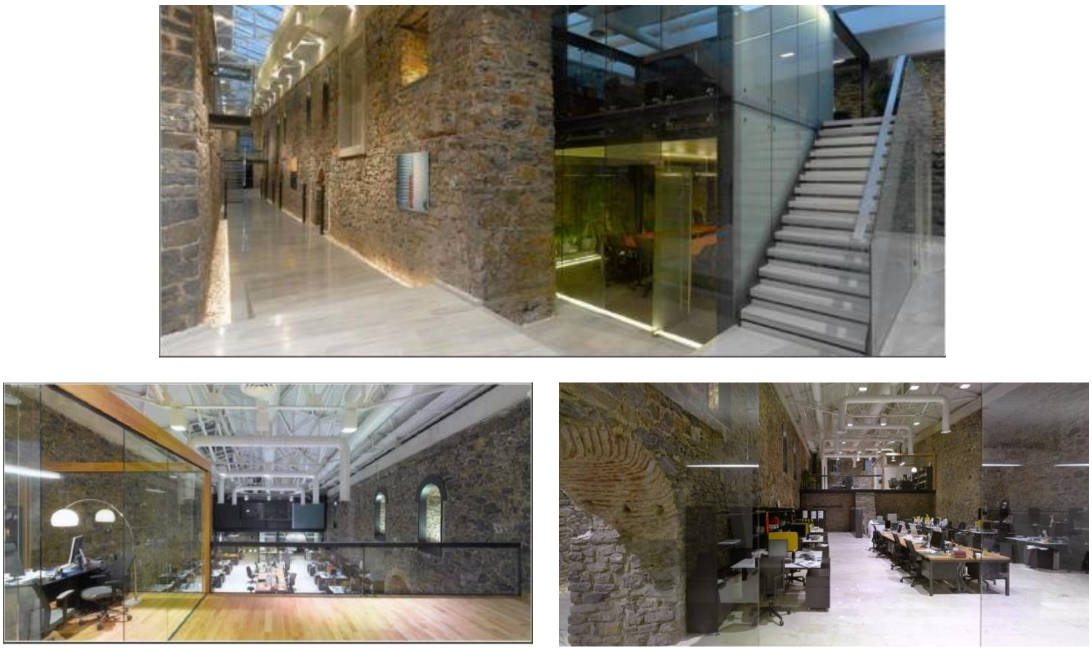

Figure 2.18. Interior of the Kasımpaşa Salt Warehouse after Renovation (Büyükarslan & Güney, 2013)

Figure 2.17. A-A’ Section of Kasımpaşa Salt Warehouse Renovation Project (Büyükarslan & Güney, 2013)

being reversible and flexible in a long period of time. In addition to this, using the high ceiling as potential is another advantage gained with the designed insertion. The only disadvantage caught upon the design strategy is a minor and cosmetic issue, but the load-bearing steel columns which rise almost in every space of the building are obstructing the design variety and making every space look alike to each other.

The major outcome of this case study evaluation is, with making independent structural elements, a structurally healthy building can survive and sustain its life without any irreversible intervention.

2.3.2. Cases from World

1| Factoria Cultural Matadero, A Re-use of Disused Warehouse as Workspaces for Start-Up of Cultural Bussinesses, Madrid, SPAIN

The disused warehouse building is located within the Matadero Madrid contemporary arts center in Paseo de la Chopera near to Madrid city center. The project is one of the

Figure 2.19. Image A: Image Showing Location of the Building, Images B, C, D: Interior of the Warehouse after Renovation Project (ArchDaily, 2014).

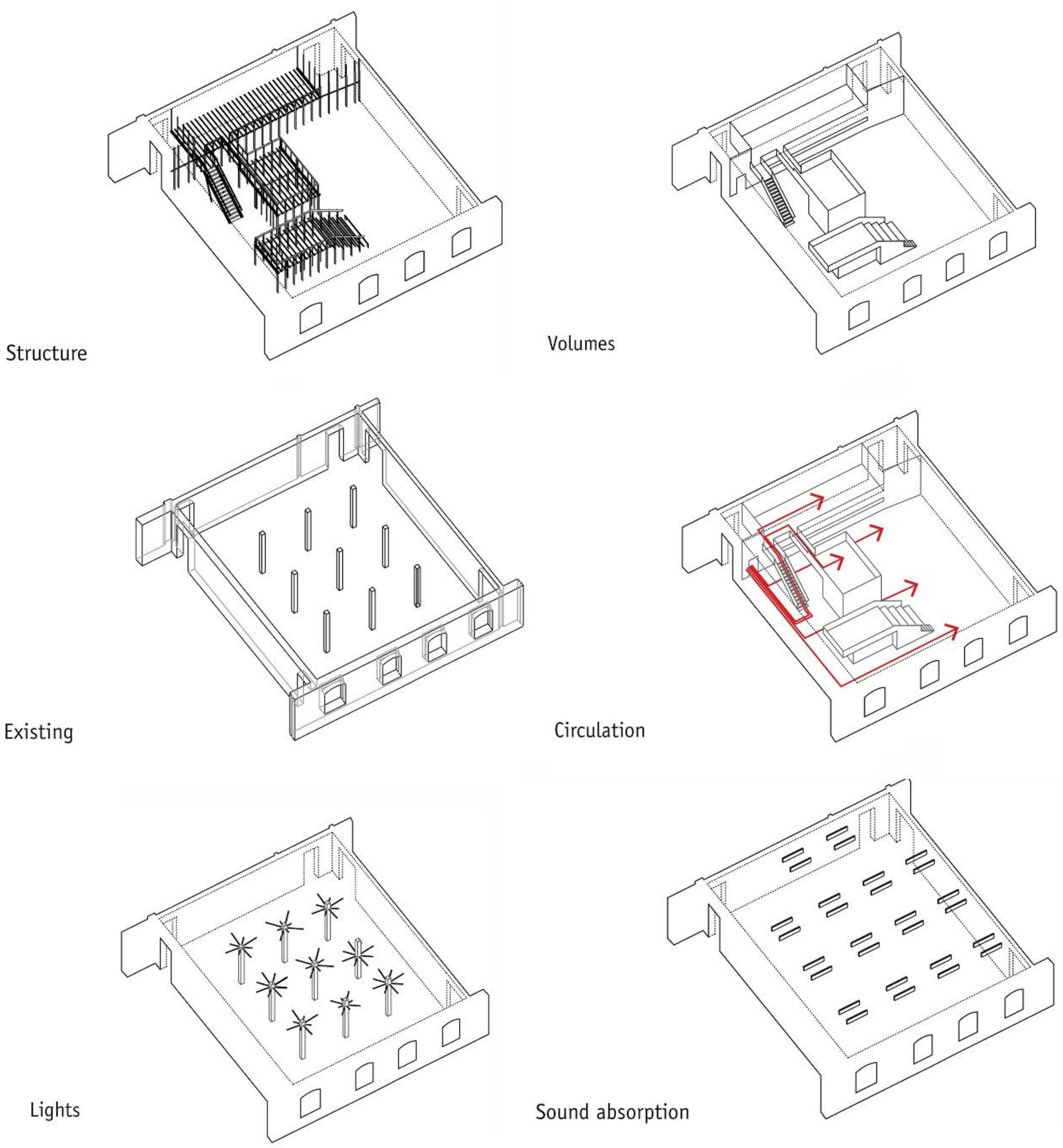

Figure 2.20. General Design Concepts of the Warehouse Reuse Project (ArchDaily, 2014).

55 projects among Golden Lion prize-winning Spanish Pavilion at the Venice Biennale

With its purpose to show its "radical" approach which emerged in Spain because of the financial crash in 2008 (Griffiths, 2016). The building those office stations implemented, is part of a complex of buildings which's aim of construction is a slaughterhouse and market complex in early 20th century. Since 2005, some buildings in complex used as a cultural venue and the re-use project of the warehouse completed in 2014. The total area of the warehouse is 484 m² (ArchDaily, 2014) and as the site is owned by Madrid City Council, the changes made upon the original architecture must be capable of being reversed (Griffiths, 2016). So, the design proposal of the project shaped according to those restrictions. The new function given to the building is a space open for start-up businesses and creative enterprises. The architecture firm Office for Strategic Spaces collaborated on the project and the main architect in charge is Angel Borrego Cubero.

As mentioned previously, the design proposal was shaped according to the restrictions of Madrid City Council and there are some other restrictions for designers

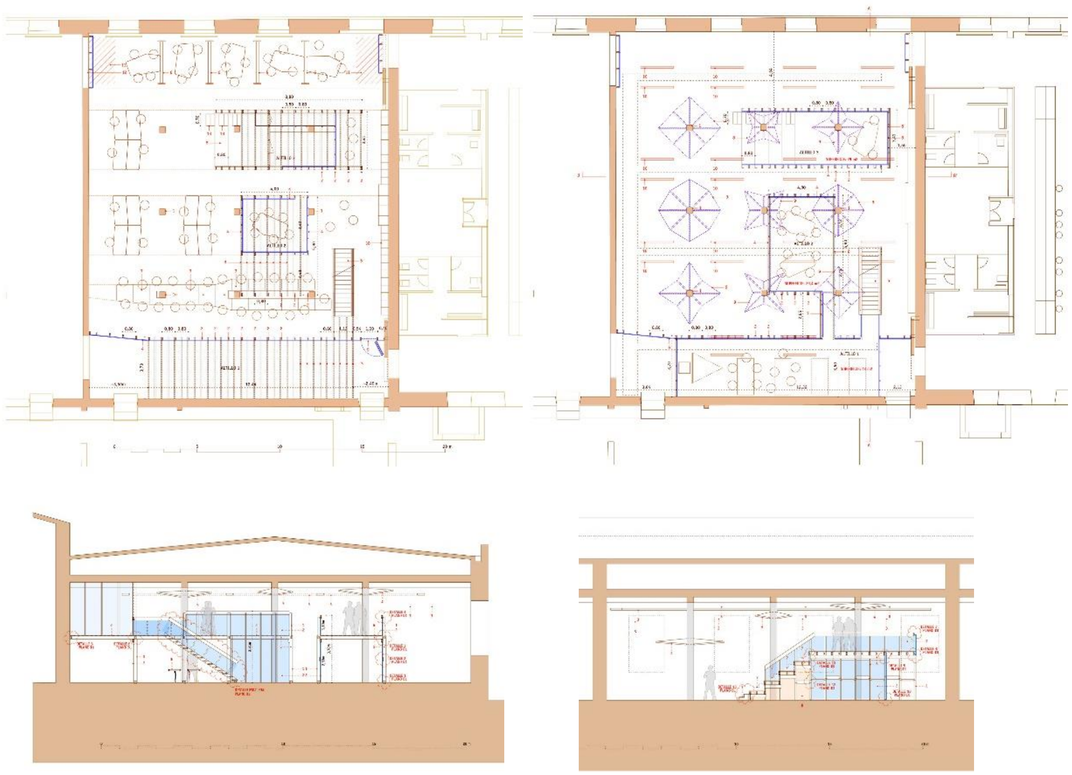

Figure 2.21. Above: Layout Plan of Ground and Mezzanine Floor Additions of Warehouse Reuse Project, below: Sections Showing Ground and Mezzanine Floor Additions (ArchDaily, 2014).

such as having limited money and big needs for the given function. As a design solution, no intervention made among existing warehouse buildings, and the structures created inside it with basic materials anchored to the floor. Those materials were chosen for constructing them as sustainable, affordable and reversible.

Exposing almost every joint and connection detail is a particular design decision of the related designers. The used building system is a timber frame system composed of exposed joints of the cost-friendly material local pine lumber, all in standard sizes selected for simplifying the supply and construction of them. As lightweight translucent material, multi-wall polycarbonate in large sheets has provided so that they allowed the setup of the walls to be finished in one day (ArchDaily, 2014). According to the article in ArchDaily, the area of the new construction inside the building is approximately 340 m² with the addition of mezzanine floors (85 m²) so, insertion occupies almost 60% of the total area. Having two levels allows more flexibility in splitting functions. As Griffiths (2016) mentioned, the insertion composed of three distinct small volumes near the entrance helped to organize the program of the building and circulations around it. It is expressed that, the area designed in a way that, become silent from the entrance to the end and supply variety of workspaces (ArchDaily, 2014). Besides those characteristics, environmental issues have also taken into consideration. The fact space is having a high ceiling, an open space and having a clear circulation area, allowed designers to argue about the possibility of keeping the wood material untreated with fire-retardant chemicals (ArchDaily, 2014). For the healthiness of the study area and environment, making them free of noxious chemicals is a well-think approach in this respect.

As in every design project, this project also has some advantages and disadvantages. Relatively, in this project the given function and the implemented insertion designed in a way that obtains optimal advantage from the existing space, so some minimal and cosmetic drawbacks can be mentioned about the space. The main advantage gained after the addition of new structure is maintaining the sustainability of a disused space with low-budget and easily demountable systems. In addition to that, using the dimensional potential of the open space with adding second storey provides extra 85 m² space which is important for compressing circulations at ground floor.

Besides this, creating different working areas and making spatial arrangements fruitful for varieties of different creative works are the benefits that will experience by users. If there are disadvantages of the new addition, the important one is the appearance of it which seems unfinished and not completely designed. This has confronted by the designers as a design solution for creative people working there but also has some drawbacks like limited personal space and the given unfinished image.

Figure 2.22. Left: Interior Look to the Warehouse after Application of Reuse Project, Right: A Detail of the Additional Wooden Structure (ArchDaily, 2014).

Although sound absorbents were designed to prevent noise, the thin walls created with Plexi material can create some privacy intrusions. What was learned by the evaluation of this case study is, having financial drawbacks is not an excuse for designing user-friendly and qualitative spaces. Compressed use of the needed areas is providing benefits in spatial arrangements and circulation arrangements. Following this, having a gradient spatial arrangement from public to semi-public or noisy to silent is a key for arranging adequate spatial sequence.

2| **A Barn House, Re-use Project of a Barn Transformed into a House, Monte Real, PORTUGAL**

3| A barn, which its original function is storing the crops in a farming area or using it as a stable has converted to a house in Monte Real, a town and a former civil parish in the municipality of Leiria, Portugal. The Lisbon-based architect Inês Brandão and her architecture firm prepared a renovation project for a 50-year-old barn for continuing its original function, with additional residential use. The project designed as a family home for a young growing family (Morby, 2015).

4| The goal tried to be achieved is explained by Brandão is; “maintaining existing memories from a space that was once the stage to such varied experiences” (Morby, 2015). With this respect, as a design proposal, a black painted box that occupies 20% of space in the residential area containing all wet spaces had prepared. The building is already intervened with the applied project but, as a design strategy, for preventing the building from water isolation processes and the installation of wet spaces, fittings, mountings, those functions are limited within a black box, a furniture alike element. The back to back design of the toilet volume and the open kitchen arrangement allow less use of fittings and installations. Along with this, oriented strand board (OSB) used as the construction material which is a type of recycled panel made up of wood strands.

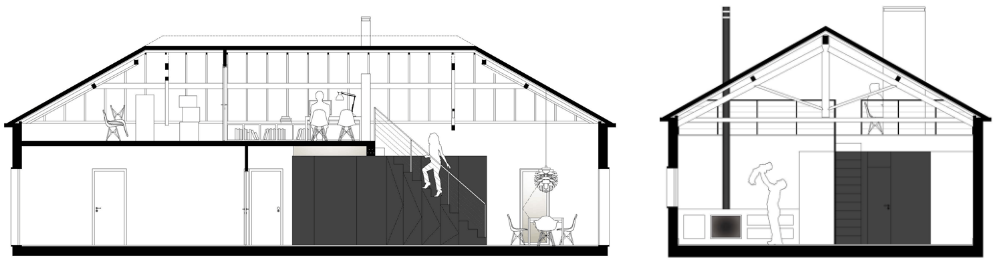

Figure 2.23. Sections of the Barn Building with the Additional Volume (ArchDaily, 2015).

Figure 2.24. Interior of the Barn Building After the Application of Reuse Project (ArchDaily, 2015).

As another goal wanted to be achieved is making this transformation in a low budget way, cost-friendly and environment-friendly material used that was an important focus for the designers. Another advantage obtained by the use of OSB is water resistance. Although it is a wood alike material, it gains water-resistance after the engineering work as a finished product. Following the wet space functions, this box provides some storage area and a staircase that allows inhabitants to reach the mezzanine floor upon the installed box. The independent element carries its own load and it is not anchored to the building. It is called a “furniture piece” by ArchDaily which accentuated by the new elements, materiality and reversibility. As mentioned in Morby’s article in

Dezeen, the mezzanine floor of the barn was used for drying grain. That furniture piece rise upon there is allowing inhabitants to the new work area designed upstairs which offers a quiet retreat for them (2015).

In this case study, barn building renovated in all means to be converted as a house. Interventions made in all spaces and repairs and changes have changed the whole perception of the barn. It is an advantage for the existing building to design a piece of furniture like enclosed areas not to tear up the building with many interventions and additions. On the other hand, building was entered some major changes like the addition of a fireplace and whitewashed walls. It is criticizable that, the design idea

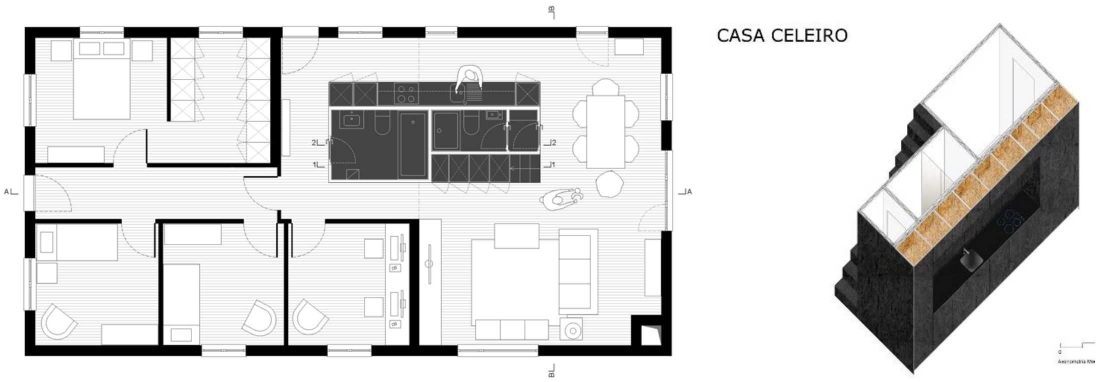

Figure 2.25. Left: Layout Plan of the Barn Building with the Additional Volume, Right: Isometric Wiev of the Added Volume Inside Barn Building (ArchDaily, 2015).

doesn’t maintain a holistic approach to the existing building but, in some critical points, reversible and flexible ideas applied in a well-considered way. Those can be considerations about the advantages and disadvantages of the related insertion to the building.

The learnings about the building are the inferences from the evaluations made above. As mentioned before, the main goal of the design team was to maintain existing memories within a very small budget. The information about the building, and about its health status before renovation is unknown but, it is a fact that the existing interventions changed the whole spirit of the building. It can be said that looking only to the interior photographs of the building, it is a newly made modern building without knowing it is a barn beforehand. But, looking from the other perspective can bring one to a point as the new insertion prevent building from other irreversible interventions which are true for this case. In conclusion, designing with a holistic approach for conserving the spirit and memories of the building is more eager to achieve successful end products for the sake of the sustainability of buildings.

5| Tesa 105 Conversion, Re-use of an Industrial Hangar as an Office Space and Opening It to Public Use, Venice, ITALY

The third examined case study is an example of conservation of the industrial heritage building. This building is one of the many hangar buildings built next to each other and it provides a single-spaced huge interior area. Although the whole building has

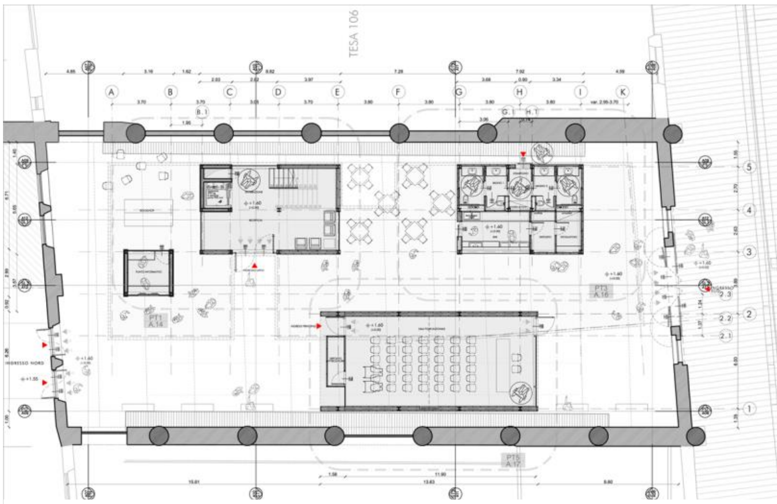

Figure 2.26. The Layout Plan of Tesa 105 Project (Archdaily, 2012)

gone under a full intervention with its architectural elements as entrances and windows, the main goal of the project is using the building as a shelter for the new insertion. It is also the reason why this project has chosen as an example case study. The hangar building located in Venice, Italy form 16th century is a structurally stable building from outside and the approach applied for this project is to add a new contemporary architecture inside to generate a connection between the old and the new (Archdaily, 2012). After the decision to recover and reuse of Venice Arsenale, a competition convened in 2006 named Arsenale di Venezia Spa International Design Competition. The name of the project "Tesa 105" has given by the winner of the competition. The year of the project application is 2012 and architects from the architecture firm Estudio N, Andrés Holguin, David R. Morales, Alvaro Solis has developed the design and application of the project. The total area of the project is 1100.0 m² which provides space for variety of additional functions. The building was empty and obsolete before the applied reuse project. The aim is to add a new building

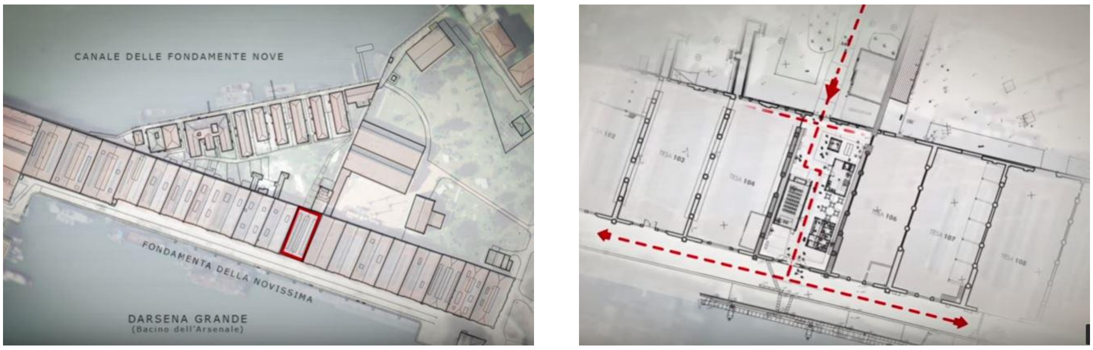

Figure 2.27. Left: Site Map of the Building, Right: Designed Inside- Outside Circulation Path (Ufficio Stampa Venezia, 2014).

inside the structurally healthy shelter which capable of introduction of living space. In addition to this, another point architect took care of is generating a non-visible insertion from outside.

The additional building inside the historic hangar building has 3 stories height. The new building has anchored to the ground floor level and material used for the construction is steel. Some spaces generated on the ground floor also work as load-bearing structures for upper floors. At ground floor, more commercial and public functions have given to the designed areas. Informational areas, bookstores, an all-purpose auditorium, and a bar have designed with connection to open spaces (Figure

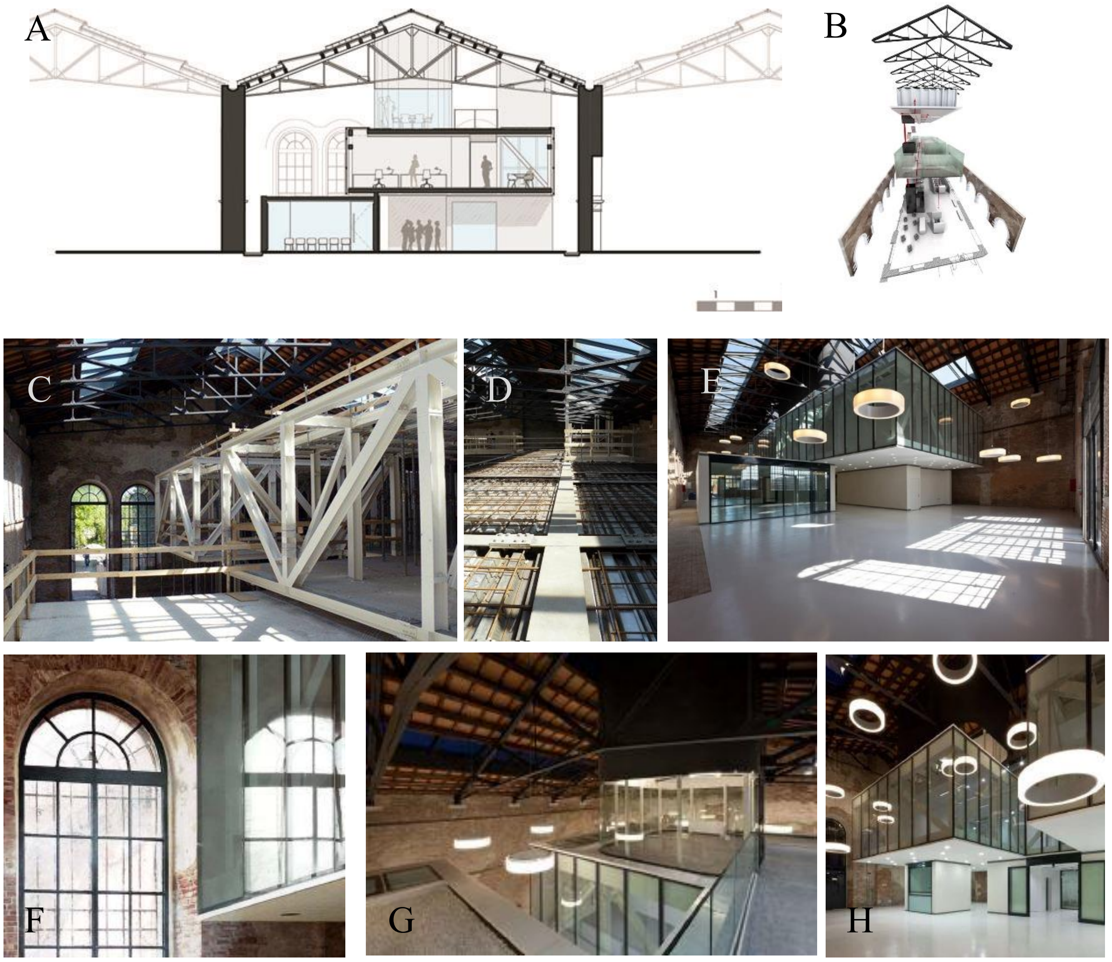

Figure 2.28. Image A: Section of the Building Tesa 105 with Proposed Conservation Project, Image B: Exposed Axonometric view of the Building and Intervention, Images C&D: Photographs taken form the Application Process of Additional Spaces, Images E,F,G & H: Interior Visuals with Completed Conservation Project.

2.27). For being invisible from outside those structures have raised the first and second floor with hiding behind existing walls. In addition to this, the first floor has coated entirely in screen-printed glass panels and this floor hosts offices of Arsenale di Venezia Spa, meeting rooms and wet spaces as an array of bathrooms (Archdaily, 2012). Also, in second floor, generated areas were used for offices and meeting rooms.

From the approach of the project, what has derived different from the other projects is taking care of the visual continuity and reflecting it to the design of the new insertion.

The search for translucency inside the building and especially comprehending the importance of the outside visual persistence are the strong sides of the applied project for the historic hangar building.

6| Sankt-Marien Kirche, Insertion of an Additional Function into Saint Marien Church, Müncheberg, GERMANY

This re-functioning example has selected as a case study in the scope of this thesis because it includes an independent insertion that added for providing sustainability to the use of the 13th-century church after renovation. Independently from its function, it is necessary to examine the contribution of the new structure to the building with its different functions added to the actual space. According to the Sankt Marien Church's web site, the history of the church can also be seen as a chronicle of the Müncheberg city. It built by the monks of Cistercian Order as the first permanent building of the city at the highest point of the city (Stadtpfarrkirche Müncheberg, n.d.). As centuries passed, the building was repeatedly rebuilt and expanded. As an example, to those interventions, German architect Karl Friedrich Schinkel added a Gothic campanile and new entrance porches between 1817 and 1829 (Brooker, 2013, pp. 226-229). At last, at the end of World War II, church building became victim of war and was badly damaged. It stayed that way until establishment of a competition in 1991 for the restoration of it. It was a remodeling competition to adopt several other functions that were important for the community (Sanders, 2013).

Klaus Block proposed a pragmatic solution as a design proposal and won the competition (Brooker, 2013, p. 228). It was proposed that; the church was no longer used as much as it used in the past except some important dates like festivals and special occasions. So, an independent function needed for the continuation of church function of the building and making it the center of community again.

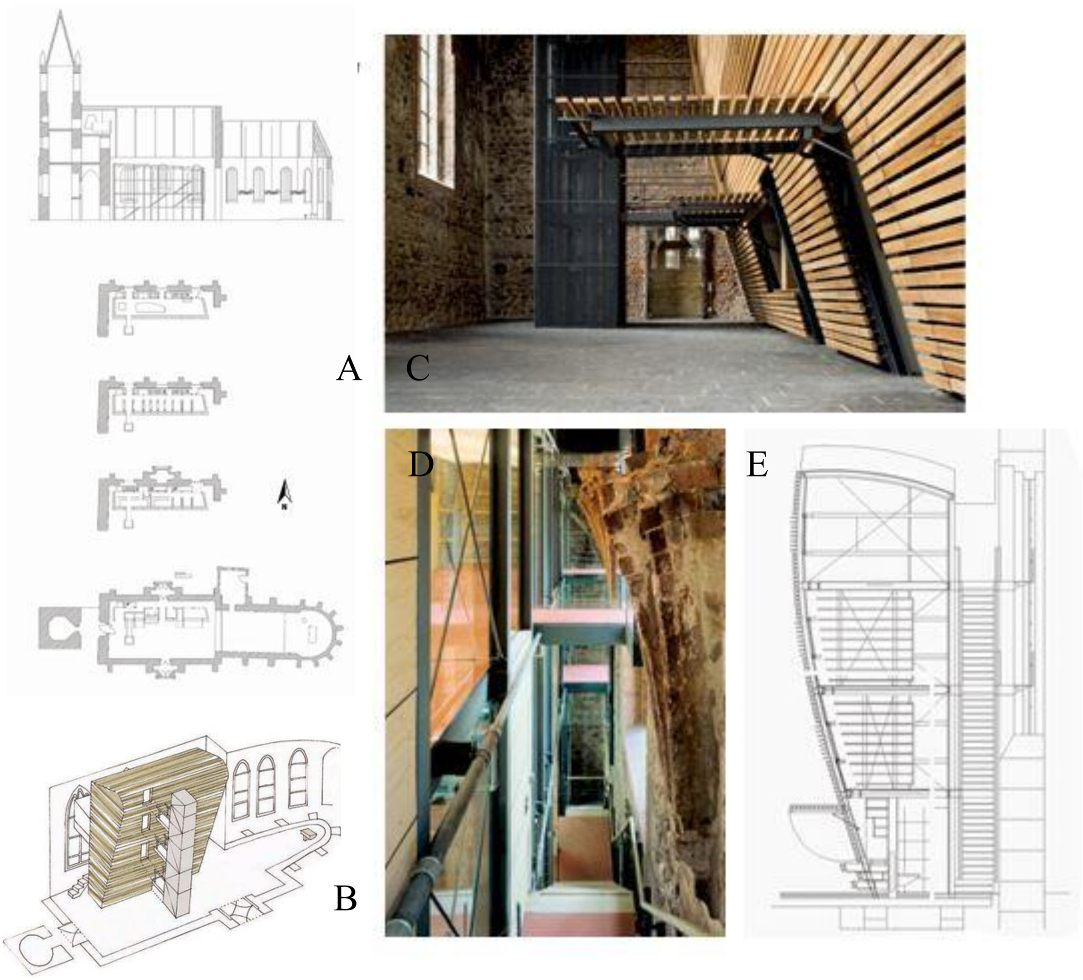

Figure 2.29. Project Drawings and Photographs of the Insertion, Image A: A section showing steel framed structure and Floor Plans from 3rd floor to Ground Floor from the Top, Image B: Axonometric Drawing Showing the Insertion and Altar Table located in the Right Apse, Image C: Entrance of Insertion and Lift Tower which Connected with the Library on Every Floor with Bridges, Image D: Photograph Showing the Relationship of Staircase with New and Old Structures, Image E: A Short Section Cutting Through the Vessel like Structure to Show Structural Elements of it. (Brooker, 2013, pp. 227-229)

The new addition needed some independent space and those two functions needed to be in a symbiotic relationship. Because of that, the architect decided to house a library inside the tall ‘nave’ of the church and design goal in that manner was a self-standing tall interior element which only anchored to the floor of the building. The word inspired this insertion; ‘nave’ which means “ship” in German. (Brooker, 2013, p. 228)

It is a large object that rises up to 4 floors. The ground floor contained the service area which worked for both church and library. The second and third floors housed the library and community office and on the third floor, there is a meeting room for council chamber. The vertical circulation provided with addition of stairs between insertion and old church wall and a new free-standing lift tower connected to the library on each floor with bridges.

The structural system of the insertion is a steel frame. This designed frame clad with horizontal ash slats which allow required light inside and it allows the view out of the inner glass skin of structure (Brooker, 2013, p. 229). Each floor has structured by concrete flooring and steel bracings, and the bookshelves conceal them as a design decision. As seen in Figure 2.29, A; insertion occupies approximately 25 percent of the whole interior area. It occupies much in vertical dimensions and its vessel-like shape allows less loss of space on ground floor level.

The advantage of the new addition is based on the purpose of the construction of it. The addition without giving the extra load to the existing building provides the sustainability in use of the church. Besides this, it did not eliminate the original function of the building which mostly seen in adaptive re-use projects. It is a respectful intervention to the building. With this situation; the only possible disadvantage of intervention is loss of space from the original church function. It is obvious that the effort given to make the church community center again and providing the sustainability of the use of the building with an independent insertion with minimum intervention to existing building, is making it an intervention that can be shown as an example. This practice did not prevent change, but it shaped it in a reversible manner

7| Chamber of Commerce, Insertion of Additional Functions to the Existing Chamber of Commerce Building Hall, Hamburg, GERMANY

In this reuse project, a working place that reflects the firm's character has installed in the same functioned neoclassic building (Brooker & Stone, 2011). The existing building located in Hamburg city square in Germany was built in 1841. It has lost its users by the changes in time and city and with the effect of moving the stock market (Brooker & Stone, 2011). As a result, for opening new work fields for varied businesses Behnisch Architecten firm proposed a new interior plan to this historical building and won the design competition in year 2003. The project has applied in 2006-2007 to the total 1000 square metered area space.

The new insertion is planned as a new business start-up center which offers variable facilities like meeting and exhibition. The goal which wanted to be achieved is the addition of several floor levels within the existing hall which also have respect for the present fabric of the historic building. As can be seen on the layout plan shown in Figure 2.30 the new insertion adds an independent interior space to the "Börsenhalle" which is the trading hall. The design proposal occupies 1/3 proportioned area of the hall on the ground floor level. Space occupancy has tried to be minimized by

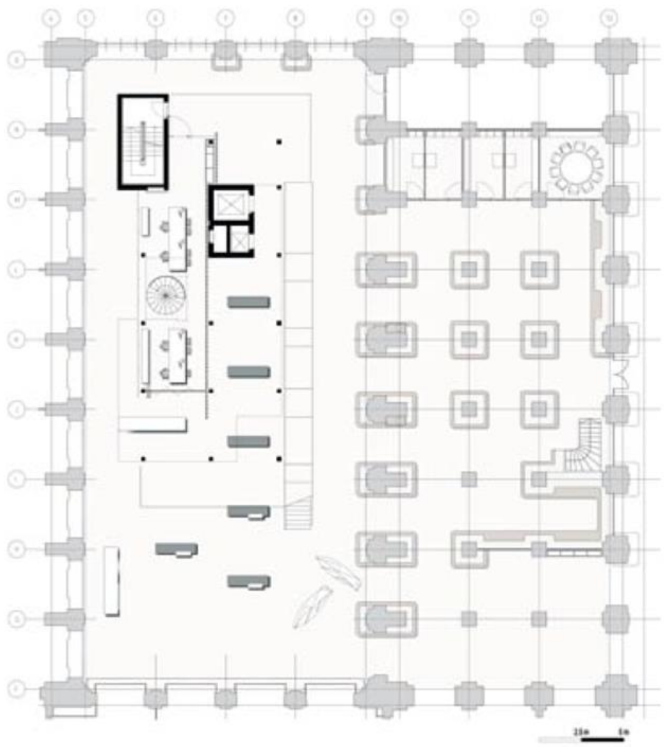

Figure 2.30. Layout Plan of the Hall (Börsenhalle) with the Insertion (Brooker & Stone, 2011).

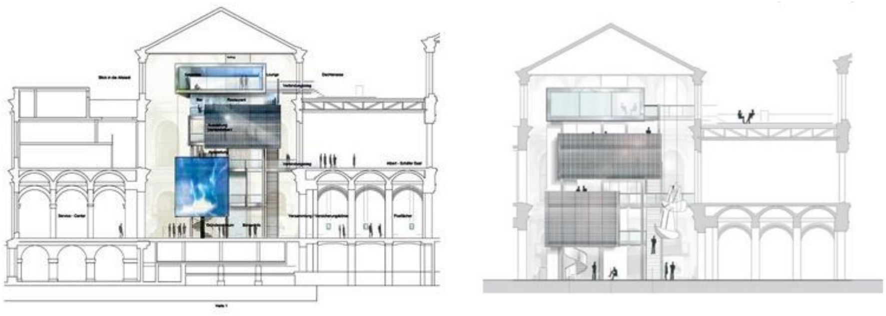

Figure 2.31. Section of the Building with the Offered New Insertion into the Hall (Börsenhalle) (Brooker & Stone, 2011).

translucent material use and with the use of hollow spaces between floor levels (Archdaily, 2009) The integration with the historical background tried to be conserved with this approach. Floor by floor, the integration with the new with the old has some interactions physically and visually which offers new perspectives to the new, old users and visitors of the building (Brooker & Stone, 2011).

The new structure was built on stainless steel load-bearing piers which allow the use of layers and planes throughout floor levels. Lightness, immateriality, and contrast of solid void relationships have tried to achieve with this construction method. The Piers located on the ground floor are the only intervened part of the building which projects name “Haus im Haus” is also implied. Only the first floor has designed which new insertion has a relationship with the old building with a bridge leaning on it.

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The existing Chamber of Commerce building is a healthy and a grand building which lose its frequency of use. It was already in use before this project which provided the sustainability and conservation of the building. The advantage gained with this intervention is firstly the acquirement of new users which creates an additional sustainability layer for the historic building. With the exhibition organizations, the increased rate of visitors will offer more meeting points and bonds between people and the historic building.

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Also, what was learned with this project is, for upgrading a building, it doesn't need to be neglected or in an obsolete condition. With the given respect to it, a value layer has cast upon the potential of the building. Although this example is not an adaptive

Figure 2.32. Interior View of the Hall with the Newly Added Block (Archdaily, 2009).

reuse case, the inserted block and way it built is a reason why it researched in the scope of this thesis.

4| The SHED Project, Installation of the New into Vacant Properties like Warehouses and Offices, London, ENGLAND

This case study is offering a furniture alike self-standing temporary affordable housing for young professionals inside empty properties like warehouses and office blocks.

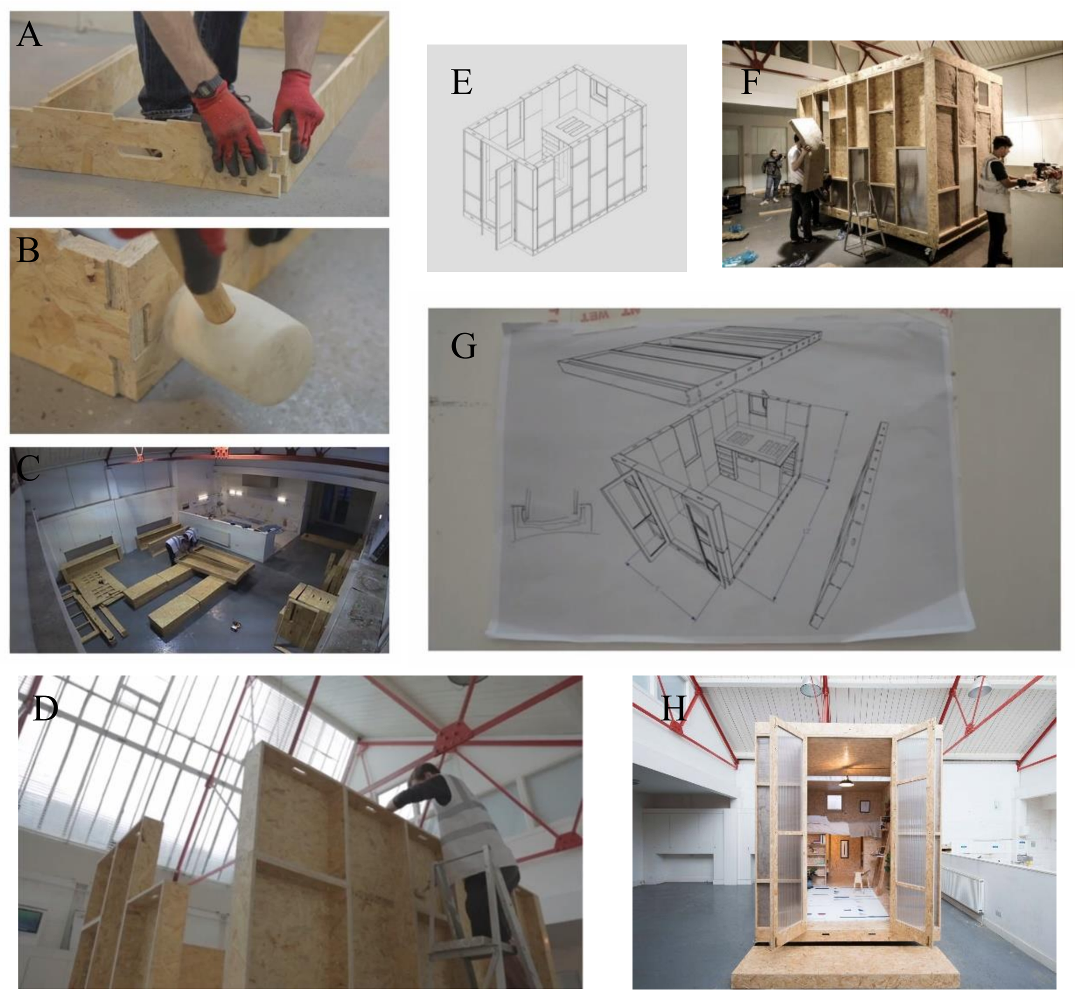


Figure 2.33. Images A&B: Joinery Detail of U Module, Images C&D: Images shot in the Application Process of U Modules, Images E&G: Drawings Showing How to Applicate U Modules, Image F: Application of Thermal Insulation Inside U Modules, Image H: Front View of the SHED After Installation (Studio Bark, n.d.).

Studio Bark which is a London based architecture firm have teamed up with the property management company Lowe Guardians to form a new way of affordable housing for empty properties to prevent them from squatters, vandals and deterioration (Lindsay, 2017).

The main goal of the firm is to design a DIY[10] housing module that provides small living space for abandoned buildings. Creating private rooms for the guardians who spend their nights in the abandoned buildings was time-consuming and needs much effort. That micro-home designed for easy assembly for those kinds of occasions. It is an environmentally friendly solution constructed with inexpensive and low-impact materials. Smart ply; which is formaldehyde-free oriented strand board, lamb's wool

Figure 2.34. Image A: Image Showing Left Side of the SHED, Image B: The Detail of Joint of two Different Materials Wood & Policarbonate, Image C: Interior View of the SHED (Lindsay, 2017).

[10] DIY: Abbreviation for, "Do it Yourself", the activity of doing or making something (as in woodworking or home repair) without professional training or assistance; broadly: an activity in which one does something oneself or on one's own initiative (Lindsay, 2017).

insulation and recycled polycarbonate are the materials composing the mini living space. Besides this; all those materials made in United Kingdom which decreases their carbon footprint (Studio Bark, n.d.). The machine cut oriented strand boards were minimizing the wastage of material and provides accuracy in composition of the module.

The insertion can be applied to anywhere needed. It is not anchored to the floor indeed, it has wheels to ride it to different places inside the applied building. One storeyed insertion has its own mezzanine which is actually a place for the bed. This module can be assembled with only using a mallet and a drill. First, the U-Build system has assembled composed of CNC cut oriented strand board U type modules (Studio Bark, n.d.). Those framed timber U modules carry their own loads in order to form the walls of the SHED. Than those modules combined with each other in a way allowing some natural light and ventilation gaps (Figure 2.33,D,G). For those openings; recycled polycarbonate material used as a translucent and lightweight material (Figure 2.34,B). With lamb's wool material, the insulated and soundproof SHED has completed (Figure 2.33,F). It provides moderate-quality space for spending a night in it without a wet space. A bed, some studying space and a place for resting have provided (Figure 2.34, C). An approximate 5 m² has occupied by this module.

The main advantage of this insertion is being totally independent of the existing building. It provides an extensive use area and it can be assembled just in one day which optimizes the time management issues. This study is not an adaptive re-use case, but it examined for its modular and low waste characteristics. The module itself can be reused several times which a contribution to the sustainability of different buildings is. The key point and important advantage of it are having a simple modular design that allows assembling it without professional training or assistance. This furniture alike living space does have only one disadvantage. Lack of wet space even if it allows easy mounting, is limiting the use period of the module. Even for one night, inhabitant's needs are important and urgent. What learned from this case study is; with an insertion that corresponds to the minimum requirements of its inhabitants, realization of the sustainability of a historical building can be achieved. Different from other case studies; this proposal is suggested for any kind of building. It is not a solution for just one building, so it can be said that as a case, it has a similarity with Ayvalık Depot Buildings design proposal.

8| River Studios, Re-use of a 1930's Warehouse as Production Studio, Melbourne, AUSTRALIA

River Studios is an establishment located inside in a large warehouse on the edge of the Maribyrnong River in West Melbourne. It is an initiative of Creative Spaces which

Figure 2.35. Images A, B, D, E, F: Interior of the Warehouse After Starting Used as Studio as a Reuse Project, Image C: Layout Plan of the Warehouse and the Reused Part with the Insertion (Heritage Council Victoria).

is a program by City of Melbourne's Arts and Culture branch (Heritage Council Victoria, p. 10). The complex housing 62 studios and 80 artists with the help of a 10-year lease of the large warehouse by the owner of the building to City of Melbourne and Arts Victoria. The project suggests an untouched concrete shell as a 1930s warehouse and temporary divisions with affordable divisions inserted in a manner that allows dismantling after 10 years (Heritage Council Victoria, p. 10). The building was not heritage listed and had been vacant for twenty years until 2011, this project had signed.

The Project prepared by Breathe Architecture and the key aspects of their design fit-out strategy is organized under concepts as; designing for growth, flexibility, reuse, and disassembly (Heritage Council Victoria, n.d.). The main design goal in this case study is; letting existing warehouses for providing the "architectural delight" and partitioned the interior into 62 multiuse studios in different sizes, different levels of enclosures and service areas (Heritage Council Victoria, n.d.). As there were a very low budget and the needs of the user group, artists, did not need very high-quality interior design, low tech but simple partitions were designed and assembled. Those partitions only anchored to the floor of the existing building and they made from cyclone wire fencing and timber framing systems. The non-loadbearing parts of those partitions were detailed with donated, found or salvaged different types of items. There were no restrictions for those materials so, a door or a corrugated iron sheet or some found textile were installed for dividing artist studios (Heritage Council Victoria, n.d.). For a 3000 m² area $300.000 budget was considered appropriate by client so that; the work has done much in collaboration with artists, students rather than professional builders. Along with those new studios, lift for disabled access was assembled which is easy to dismantle. Some upgrades needed to be done in the entire building as, stairs, balustrades and plastic film to be fitted to glazing as warehouse did not meet the minimum requirements of healthy use of Building Council of Australia code. On the other hand; no wet trades applied to the original building for any reason.

Inserted additions are in one storey height and each of them composed of different materials.

The advantage of this case study is indeed the form of treatment. The satisfactory understanding of user-profiles and their intentions is the most important factor in the formation of the project. With very limited budget, extensive key points for client, artist, and designers were achieved at a moderate degree of detail level. The reuse of the building has achieved directly by reversibility approach with completely demountable fixtures. From the opposite point of view, in that kind of huge building and for that many different activities, sound absorption and spatial organization become important.

As a disadvantage; semi-open spaces that can create sound liquidity from one studio to another can be given. This fact can create a cacophony inside the building which evidently effects artists and their works in there. Along with this, although use of different materials as partitions creates a scene like a patchwork it also creates an unorganized scene. It seems unnecessary when the artists are taken into consideration, but interior can become a chaotic place where artists will question the work together with their possible irregularities inside their studios. At last the lessons gained from this case study in Melbourne is about retaining the industrial heritage for the public good. With a short-term solution, a value gained by the City of Melbourne with the collaboration between architects, students, and artist-tenants.

9| Burckhardt Machine Factory, Re-use of the Burchardt Machine Factory as Multifunctional Working Environment, Basel, SWITZERLAND

Burchardt Machine Factory’s main assembly hall which was used as an event space before this project was needed to reform that place a multi-functional working environment (ArchDaily, 2015). The structure which seen as a shell structure in this case study, inhabits the main assembly hall of the Burchardt Machine factory in this Swiss city Basel, in 1930s for making perforation machines. After the new tenant decided to make functional changes, by Stereo Architektur firm, project was designed

Figure 2.36. Left: Front Façade of the “House within House” Addition, Right:Interior of the Space Located on the First Floor (Tucker, 2015).

and assembled in the year 2014. The new function provides start-up businesses some co-working areas. It allows an adaptable environment, some workstations, and areas for cultural events for them (Tucker, 2015). This case study has chosen for its prefabricated and modular properties which allows variety of multi-purpose spaces with respect to the built within the existing building approach.

The main design goal of the architecture team was to create a space which offers countless possibilities for its users. Their intention was to generate adaptable spaces which met as well as small functional requirements, requirements for big occasions and events. The intervention described by the design studio as “a house within a house” and it constructed with laminated veneer lumber with exposed beam structures. The thin columns allow some built-in storage spaces for different occasions and they also support the first floor. There are meeting spaces on the second floor and big floor-to-ceiling windows allow natural light with allowing a top view through the rest of the factory. The installation of the intervention consists five steps (Figure 2.39). The first step is the same distanced wooden rectangular frames which are used as structural elements and while allowing installation of vertical and horizontal elements of two floors. On the second step, vertical elements are incorporated into prefabricated rectangular frames. The third step includes vertical surface addition to the structure which includes wooden walls and staircase and on the forth step, horizontal surfaces has added. In that part, as horizontal elements shelves are added to the structure. At

Figure 2.37. Left: Connection of the Existing Building with Thin Wooden Column, Middle: Interior of the Space Located on the First Floor, Right: Staircase from the Second Floor Decking (Tucker, 2015).

last, step five includes addition of metal balustrades to the deck at top floor and metal framed operable glass cladding for the front façade of the first floor. The use of raw material, simple details and mechanisms are manifested as design rules which because the building is liberated from environment requirements and constraints. In addition to that, the design group convince that, their additional structure is adding an identity to the existing building with its simple and decisive character (Tucker, 2015).

The building which added into, is not an historic building in terms of architectural language. This case study has decided to be evaluated in the scope of this thesis because of its modular and systematic design technique which articulated with respect to the existing building. The lesson gained by this project which is coordinating a system inside the existing will be one of the main approaches while designing a modular prefabricated additional system into Ayvalık depot buildings.

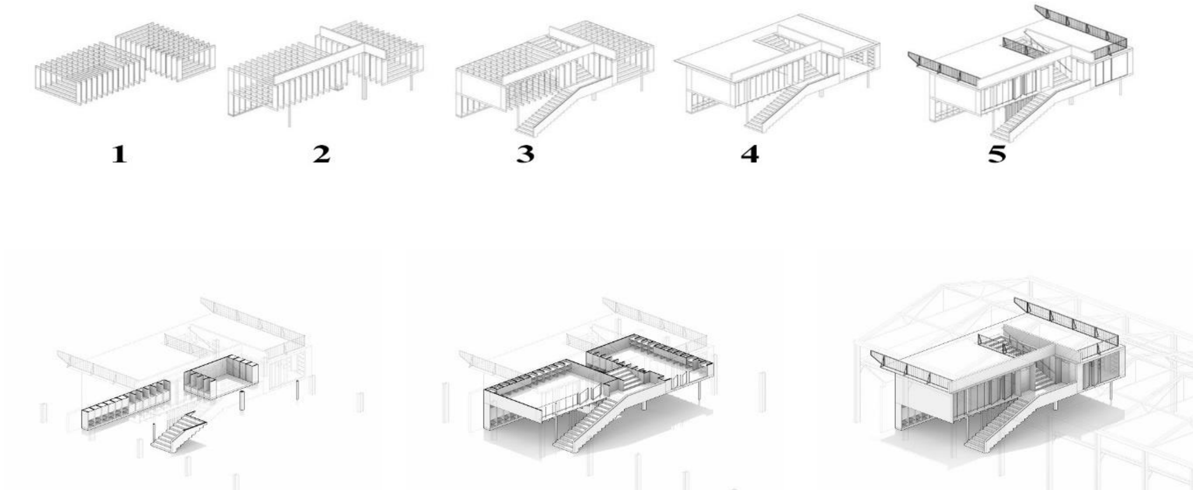


Figure 2.39. Five Steps of the Installation of Multipurpose Spaces into Burckhardt MachineFactory (ArchDaily, 2015).

Researched made about case studies within the context of this thesis has ended with this last project. In the next chapter, the formation of industrial landscape in Ayvalık and characteristics of depot buildings will be described, and the surveyed depot buildings will have defined in detail with their structural, architectural and historic characteristics.

2.4. Principles Driven from Case Studies

In the scope of this thesis, to derive some principles from the case studies, eleven different projects have studied. From those, three of them are case studies from Turkey and the rest are from different parts of the world, mostly from Europe. Throughout the examined “renewal” or “insertion” projects, in this section, assessments made upon those examinations will be evaluated. As mentioned in part 0, three criterions have identified in selection of cases as, “Is the building treated as a shell structure upon the insertion?", "Is the insertion designed in a modular design manner?" and "Are there any flexible characteristics in the inserted design?".

In other respects, the insertions to existing buildings have evaluated according to ten more characteristics. Those are for deriving principles from the design strategies of selected case studies. The original function of the building and the new function which added to the existing are the important two points that need to be evaluated. Along eleven examined case studies, two of them have used for the residential use of buildings and the rest of them are commercial buildings which varied as office spaces, meeting rooms, library, etc. Intervention to the existing is one of significant aspect which changes the evaluation of the case. As seen in Table 2.5 in five case studies, the existing structure has intervened. In detailed examination almost in all those cases, the fabric of the existing building has tended to be conserved with small changes or upgrades. The need for inserting a new structure is an indicator of conserving those existing buildings. Similar to those cases, some Ayvalık depot buildings do need only some upgrades on existing so, the examined case studies are mostly directing a proposal of an independent insertion of services for the current statuses of depot buildings.

With this argument, the anchorage to existing has become a prominent issue for the new addition. If the new addition does not have a self-load bearing and mobile characteristic, it needs to be anchored to the existing floor surface of the building. If there is no original or authentic ornamentation in the present situation of the building, most of the structures needed to be fixed to a horizontal ground. In eight case studies, the new structure has fixed to the floor according to the examinations. Throughout eight studied Ayvalık depot buildings, none of them have observed an original floor covering so that; this leads the proposal to be fixed to the floor. On the other hand, other depot buildings in Ayvalık can have original features that have conserved to present state. The design process should cover those issues and proposal should be flexible for achieving the solution.

Proportionally, how much the insertion should occupy inside the building in three dimensions is another aspect that leads the new proposal besides the surveyed existing building additions dimensional data. By case study evaluation, it can be said that the space occupation is proportionally increasing with the activity of the given function. The more commercial functions given to the insertion, the more need for extra space has occurred. In addition to this, in two examples, which residential functions are given, are occupying less than 1/5 of the total area of the building. This assessment also can be evaluated as the needed space for the services of the residential use for limited person is less than the commercial uses. So that, in our case Ayvalık depot buildings for different dimensioned single-spaced buildings, the most comfortable use proposal for those buildings will be residential use which service requirements met by the new insertion without giving harm to the existing building.

Besides all these, considering all examined case studies, there are some goals tried to be achieved when the insertion making to existing. For almost all of them, less intervention to the existing with a self-load bearing structural addition is the main goal. However, for each case some branches of goals accompanying this main goal. One of them is interested in structural concerns. In one of the examples, less intervention aim tried to be solved with raised floored independent glass boxes, and in another, the use of steel and glass have chosen as a material for light constructive visual. There are also some accompanying goals supporting those ideas. One of them is applying the project with a low budget but high spatial area and quality. It is examined that, the cases which have those concerns, are tended to use more flexible designs in their proposals with the use of wood as structural material. The tendency to designing that can be disassembled is also led more independency from the existing. Assessments, gained from those case study evaluations, are giving a perspective for the proposal of the Ayvalık depot buildings for being flexible and detachable. In addition to that, in two of studied case studies, buildings used as a shelter have met with additional functions to attract more people for extending their life span. The healthy but less used shelter building has met with new functions and also the increase in the user population provided an enhancement of the sustainability of the building. A similar example which SHED project examined as a case study has planned for temporary use function to help to keep building protected from the natural and humane dangers.

As a result, for the case, Ayvalık depot buildings featured characteristics derived from the examined case studies from Turkey and World are; making less intervention with self-load bearing structure, being flexible, creating easily detachable but also spatially qualified spaces with the most appropriate material use. As the intention for those depot buildings is generally using them as commercial buildings, the proposal for the insertion should be adjustable to both residential and commercial uses. This has planned to be provided by offering similar modules for the daily needs of inhabitants.

Table 4.1. Evaluation of the Selected Case Studies

Case Study Review Criteria		TURKEY			WORLD							
		Kayseri	İstanbul		Madrid, Spain	Monte Real, Portugal	Venice, Italy	Müncheberg, Germany	Hamburg, Germany	London, England	Melbourne, Australia	Basel, Switzerland
		Abdullah Gül University / Sumer Campus	Beyazıt State Library	Kasımpaşa Tuz Ambarı	Factoria Ccultural Matadero	Barn House	Tesa 105 Conversion	Sankt-Marien Kirche	Chamber of Commerce	The SHED Project	River Studios	Multifunctional Working Environment
What was the original function of the building?		Warehouse of Sümerbank Factory	State Library & İmarethane	Salt Warehouse	Disused Warehouse	Disused Barn	Industrial Hangar	Church	Chamber of Commerce	Vacant properties like warehouses and offices	1930s Warehouse which had been vacant for 20 years	Burckhardt machine factory
Is the original building intervened?		✓	✓	✓	✗	✓	✓	✓	✗	✗	✗	✗
Does insertion anchored to floor?		✓	✓	✓	✓	✗	✓	✓	✓	✗	✗	✓
Is there any load-bearing frame system or the system carries its own load?		Load Bearing Frame System (Steel)	System Carries its own Load	Load Bearing Frame System (Steel)	Load Bearing Frame System (Timber)	System Carries its own Load	Load Bearing Frame System (Steel)	Load Bearing Frame System (Steel)	Load Bearing Frame System (Steel)	System Carries its own Load	Load Bearing Frame System (Timber & Cyclone Wire Fencing)	Load Bearing Modular Boxing System with Timber Beams
How much does the insertion occupy the building? Proportional?		4/5	4/5	5 May	(340 m² /480 m²) 3/5	~1/5	4/5	1/5	3/5	N/A	1/5	2/5
How many stories does the insertion have?		2	1	2	2	1	3	4	6	1	1	2
What is the function required by insertion? (residential or other?)		University/ Lecture Rooms and Studios	Library	Office	Workspace for creative start up bussinesses	Residential	Public Spaces and Office Spaces	Library and community center in the parish church Müncheberg	Offices, Exhibition Galery and Cafeteria	Residential	Studio and affordable workspaces for artists.	Offices, meeting places and workstations
What are the goals tried to be achieved?		Less intervention on the existing depot building which is from 1935, with putting in a self-bearing structure inside the building.	With raised floor system and different kind of box like book closets and with the help of lightening elements achieving the goal, renewing the library without too much intervening to original building.	To maintain the original layout of the structure, the spaces are designed to protect the original texture, with light constructive joints made of steel and glass.	Low Budget- Hight Spatial Area without intervening to existing building.	Maintain existing memories with a very small budget.	The original building, a 16th century industrial hangar, is structurally stable on the outside. The new project will be contained within that structure, without any visibility from the outside.	Extending the use continuance of the church with the addition of a symbiotic interesting function to make it community centre again.	With the idea "Haus im Haus", renewing the old building with an independent structure which provides new functions and opportunuties to win new employers and bussiness owners. Engaging new functions to one of the 3 big halls of Chamber of Commerce.	Creating temporary affordable housing for young professionals inside empty properties like warehpuses and office blocks. By doing so, the company is also helping to keep these buildings protected from squatters, vandals and deterioration.	Designing for growth, flexibility, reuse and disassembly were key aspects of the fitout strategy.	The goal is to create a space, offering countless possibilities – co-working, regular office workstations, areas for casual and cultural activities, workshops – all while still being able to host bigger events. The main intervention consist in the insertion of an autonomous wooden installation – a house within a house.
What we learn from this Case Study?		**As it is being one of the important culturally significant modern heritage buildings in a huge complex, sustainability is an accomplished goal with some hard functional requirements and less intervention. Importance of the structural stiffness and healtiness of building.**	**For not losing the architectural spirit of a space, keeping the used elements simple is an important thing.**	**Without much intervention to the structuraly healthy builiding, sustainability of a building can be provided.**	**Use of cost- friendly materails as standard sized pinewood logs and plexi to achive functional and creative spaces. Compressed use of the needed areas are providing benefits in spatial arrangements and circulation arrangements.**	**Togetherness of functions is important especially wet areas.**	**The use of translucency for inviting natural light into new insertion is important. Visual connection sustainability provided with the use of glass.**	**Addition without giving extra load to the existing building provides the sustainability in use of the church.**	**Engagement of new funcitons is helping to provide sustainability of the building**	**Using housing modules as an alternative to property guardianship, but lack of wetspace is creating a massive problem which makes it inapplicable.**	**A fixed-term reuse that provides a model for the low-impact retention. Inexpensive, clever fitout provides flexibility and scope for growth and can be entirely disassembled at the end of the 10 year lease.**	**Because of the main access to the hall being a regular sized door, the whole structure had to be developed as an addition of prefabricated pieces, small enough to be manipulated by hand and easily assembled on site.**
Advantages and Disadvantages of the Insertion	ADS	Maximizing the available use area to create more lecture rooms and offices as needs of new function.	After 1884 earthquake building was disused, in 2015 restoration project was applied and building continue its own function with new insertions	With additions as mezzanine floors height potential of the building is well-used . Structures fit in the empty and high masses without touching to the existing structural system.	Low budget, easily demountable, flexible, produced extra 85 m2 space	Bringing together all the new functions - kitchen, toilets, storage and staircase with a furniture alike element	Connection between new and old and the use of the potentials of the whole mass	Addition of a new function without eliminating the original function of building	The idea of building a structure just anchored to floor, inside a hall with a great dimensional potential provides maximum optimization of the use of the available mass.	Easy assembly in just one day using a mallet and drill and can also be disassembled, transported to another location and rebuilt. Insulated with lambs wool for warmth and sound proofing.	The very low cost (300.000$ for 3000 m²) & flexibility, disassemability.	Details were invented, mechanisms kept simple and materials raw as it applied to an indoor space.
	DADS	The fact that the new insertions are so high from the ground to the ceiling have changed the perception of the space. Apart from being ofsetted from the existing columns, independency of new additions couldn't be identified from every perspective.	Limitation of the usable area because of new insertions located at the centre of rooms.	Steel columns rising in every space which obtructs design variety.	Limited personal space, unfinished image	It doesnt maintain a holistic design argument about building, just an insertion	No flexible or reversible design idea in the application of design strategy	Loss of some empty area from the church function.	the increase in the number of users can negatively affect the building.	Small and narrow living space which doesn't provide any wetspace for the user. Not a longtime housing solution.	As a user group, the artists did not expect a high-quality fitout. This allowed an effective, low-budget, low-tech response, which might not have been accepted by a different user group.	Since it is designed as an auxiliary space for a part of the building, it does not respond to the overall requirements. (wet area, kitchen etc.)
SELECTION CRITERIA OF CASE STUDIES												
1.Is the building treated as a shell structure upon the insertion?		✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓
2.Is the insertion designed in a modular design manner?		✗	✗	✗	✓	✗	✗	✗	✗	✓	✓	✓
3.Is there any flexible and reversible characteristics in inserted design?		✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓
4. Intervention Degree to Existing Building While Inserting New	high (H)											
	medium (M)	✓	✓	✓		✓	✓	✓				
	low (L)				✓				✓	✓	✓	✓

CHAPTER 3

THE CASE: UNDERSTANDING AYVALIK'S DEPOT BUILDINGS IN COMMERCIAL AREA

Ayvalık is an agricultural and industrial province of Balıkesir which is located on the north-western coastline of Anatolia. It is covered with grooves, which reflects the natural character of natural flora of the area, so from past to present Ayvalık has a special importance among the other provinces on Aegean coastline with its industrialized townscape and residential vernacular architecture. Other important settlements in the immediate vicinity are Burhaniye on the north side, Dikili in the south and Bergama in the east side. When looked to provinces nearby, İzmir, Balıkesir, Manisa and Çanakkale are the major centres surrounding Ayvalık. (Figure 3.1) It is

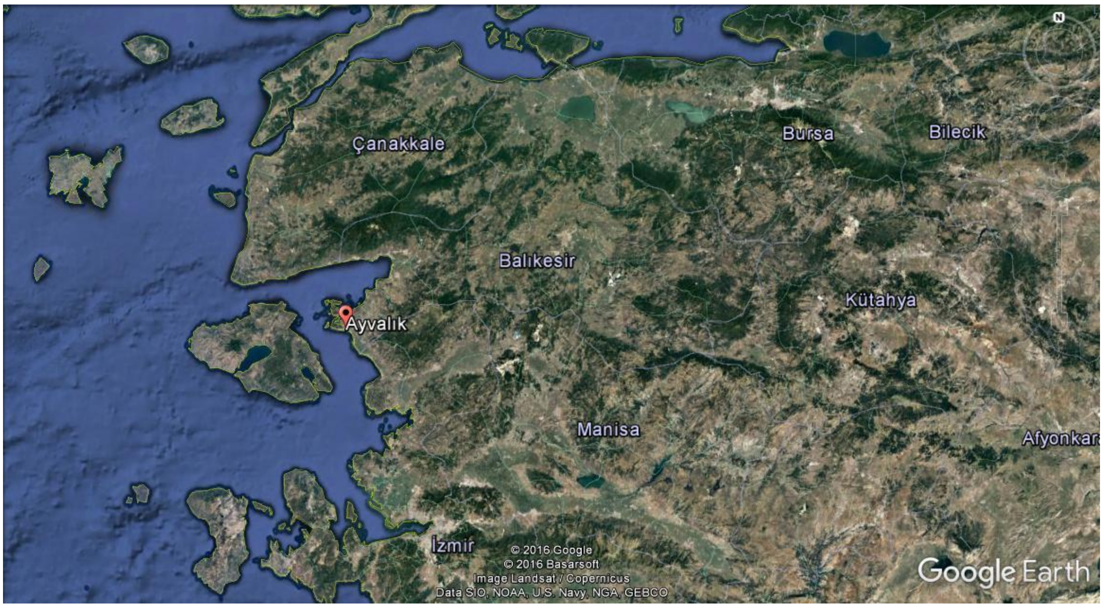


Figure 3.1. The location of Ayvalık in Turkey (Google Earth, last accessed on 05.09.2017)

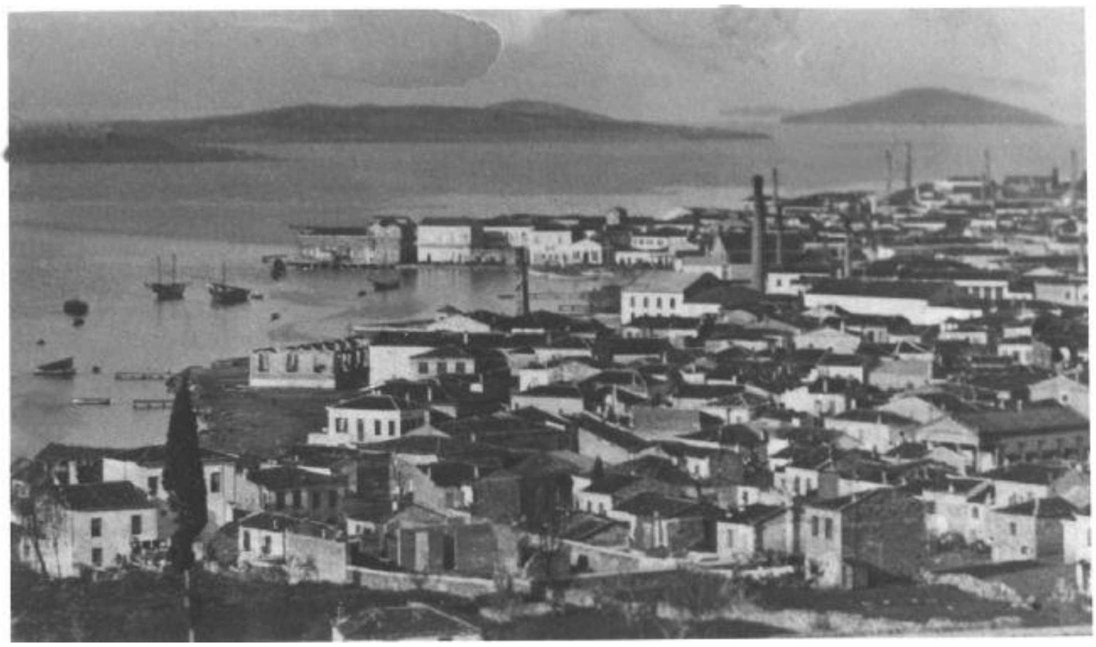


Figure 3.2. An Old Photograph of Ayvalık Industrial Cityscape (http://selme.com.tr/eski-ayvalik-fotograflari-s1007.html, last accessed on 05.09.2017)

located at the inner sea which, island Lesbos and Anatolia created in-between them with the integration of 22 islands including the biggest and nearest Cunda/Alibey.

This region is situated in a temperate Mediterranean climate. Summer seasons pass with hot climate and the winters are rainy and mild. The dominant wind is in east-west direction and this fact influenced the direction of settlement and city layout. District embodies a full set of cultural wealth with the archaeologic remains from antiquity, industrial heritage with ongoing traditions about olive and its architecture. Ayvalık (Kydonia) and Island Cunda (Moschonisi) called as “Hekatonnessos” (Apollo’s Island) in the antiquity and according to written sources, among settlements; Nassos, Pordoselini and Chalkis in Cunda, the remaining settlements are few in number. (Psarros, 2004)

Apart from the history of Kydonies which constituted the agricultural hinterland in ancient era of Midilli city-state, Ayvalık considered as erupted around 1580. (Bayraktar, 1998, pp. 6-17) After gaining autonomy in 1773 it was situated as the

Figure 3.3. Location of Ayvalık (Google Earth, last accessed on September 23, 2019)

centre of olive-oil production by Rum population. (Psarros, 2004, p. 1) According to Bayraktar, with a special agreement (Küçük Kaynarca Agreement in 1774) which had made between Ottoman Empire and Russia allowed the occurrence of foreign consulates around the Ottoman port settlements which led Ayvalık to develop in international trade. (Bayraktar, p. 6) According to the population census carried out in 1820, the population of Ayvalık has reached 40.000 and at that time in Ayvalık the major sources of income for local people are, Olive farming, fishing, milling, soap, viniculture and salting. (Balcı Akova, 2011, p. 63)

This economic transformation, production and developed trade transactions made by Anatolian Greek population, also brought some architectural needs for merchants so that Ayvalık became a more industrialized land with its Olive-oil factories, chimneys, depots, and soap factories. Ayvalık has created a cultural identity that is unparalleled in the development of the region. Thus, physical expression of the cultural pattern shown itself among building types and materials of them composing the whole urban fabric. (Şahin Güçhan, 2008) After 1870 like all around Balkan's and Anatolia, Neo-classism was the leading style (Psarros, 2004, p. 1) therefore those buildings built in that manner with many architectural features.

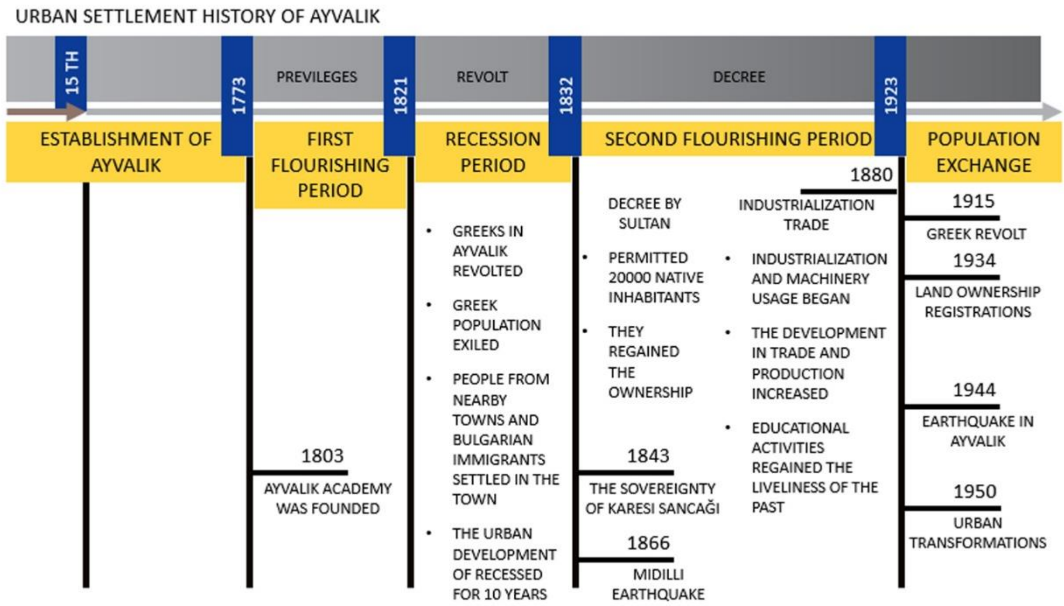


Figure 3.4. Timeline of the Urban History of Ayvalık Settlement (Conservation Project for Ayvalık – Depots Region,2005)

After Turkey's Independence war in 1923 and 1927 decisions of population exchange by both side communities' approval, those buildings lost their Anatolian Rum inhabitants. The demographic and political structural changes in post war process, and this dramatic enforcement for emigration affected Ayvalık's continual and rapid rise among other Anatolian cities because, it could not be expected that, Greek Turkish population coming from Lesvos, Crete and Greek Macedonia who live on their life with agriculture adopt immediately to an industrial environment.

Afterwards the population exchange, the total population which majorly Rum origin in 1927, decreased dramatically. (Şahin Güçhan, 2008) It is assumed that, this fact brought abandoned buildings and this situation has left the buildings out of use. Nevertheless, customs and traditions kept themselves alive with the help of architectural belongings in use, with the help of new Greek Turkish inhabitants whose source of income was trade beforehand, geography of Ayvalık with its seashore, climate, lands covered with olive and pine trees. Some of the newcomers started revitalizing agriculture production but, the earthquake took place in 1944 which caused destruction in the city. According to Akova Balcı total population in 1945 was 136.50 and since this year the population growth began again after the 1950 s. Architectural belongings within the historical pattern of Ayvalık are significant for understanding of the time that they built in and inhabitants' life. In the development and population rise process seen in Ayvalık, influential factors are the rise of olive farming, soap, and olive oil factories due to olive cultivation and the increase in industrial branches. (Şahin Güçhan, 2008)

When examined Ayvalık's planning history; in the year 1972, it was envisaged on the prepared zoning plan that, the factories which produce olive oil will be moved out from Ayvalık city centre. Despite first development plan of Ayvalık was prepared by Ministry of Public Works in 1948, information couldn't be reached about this plan. (Şahin, 1986, p. 29) In 1976, Ayvalık Centre, Çamlık Mahallesi and Island Cunda settlements have been declared as "Historic Urban Site", and green areas surrounding Ayvalık and Cunda Island urban areas as "Natural Site". (Kabasakal Coutignies, 1987) The 1983 Development Plan include effective and influential decisions about the traditional buildings to be utilized with touristic functions. Following those developments in 1984, by Ministry of Culture and Tourism, in the study entitled as "Preservation and Use of Historic Urban Sites for Touristic Purposes", city's landscape and silhouette features are worth preserving and it is suggested that the functions in the centre and causing pollution should be moved out of the city and used as tourist accommodation places. (Kabasakal Coutignies, 1987) In 1994, the Conservation Plan was prepared. In this plan; historic industrial site defined mostly as central and commercial areas. (Özbayar, 2014, p. 88) After those decisions made, in 1980's implementations among industrial buildings had begun so, related buildings studied in this thesis become abandoned with the relocation of the industry to outside of the city.

3.1. Characteristics of Surveyed Depot Buildings

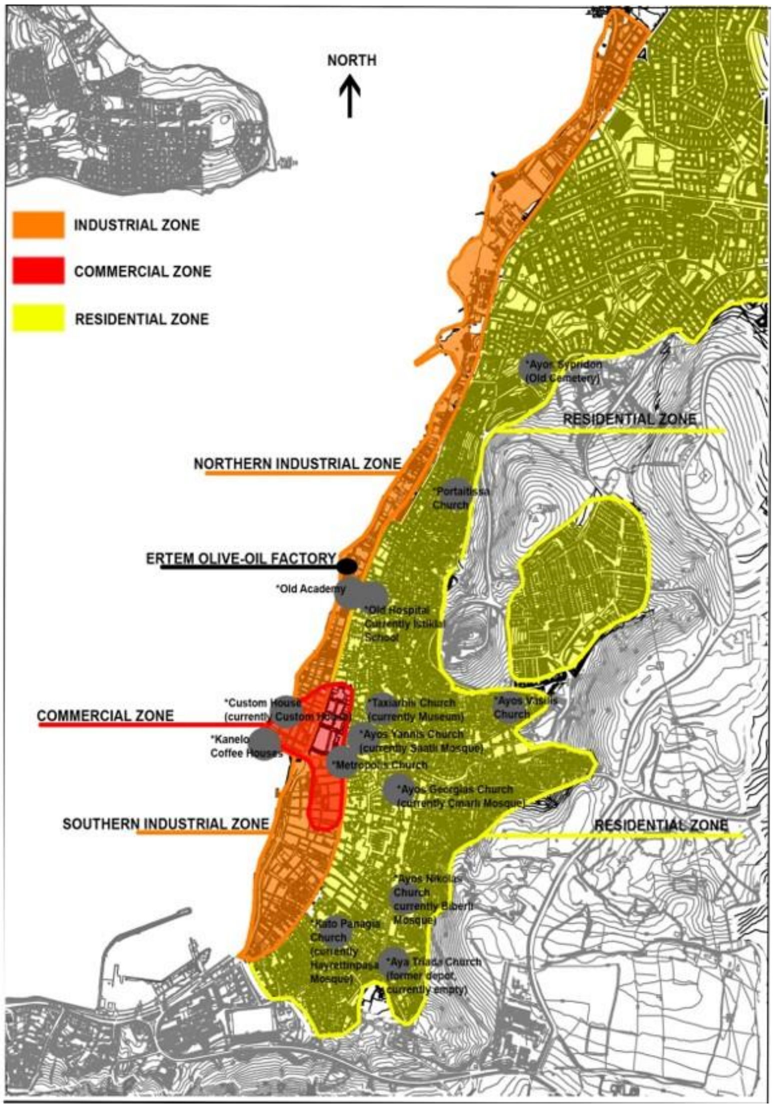


Figure 3.5. Ayvalık Urban Fabric Zones (Yıldız, 2017)

In this section, the general framework in literature about depot buildings will be generated and respectively all surveyed depot buildings will be examined in terms of their structural and architectural aspects with the assessments. Within the scope of the previously made researches there are plenty of satisfactory information about the general architectural and industrial history of Ayvalık. In our case, focusing on the commercial area and its components as depot buildings are focal points of this thesis. (Figure 3.5)

Ayvalık is one of the mostly well-studied regions among other Aegean coastal lands because of its industrial archaeology, traditional houses, gastronomic activities, agriculture. In October 2005, a conservation project prepared by the graduate students of METU in the scope of the course REST 507-Design in Restoration 3 in Graduate Program of Restoration. Projects name was Conservation Project for Ayvalık – Depots Region[11] which creates mostly the basis work of this thesis with designation of inventory of the buildings among their study area which includes depot buildings. Afterwards, a thesis written by Esra Terzi in 2007 which entitled as "The 19th Century Olive Oil Industry in Ayvalık and Its Impact on the Settlement Pattern" which, expanded the inventory beyond study area of study done in 2005 and investigate whole industrial buildings about olive oil in Ayvalık City Centre. Most of the buildings studied in this thesis have researched at that time and most of them have documented and surveyed from outside.

[11] REST 507-Design in Restoration 3 in Graduate Program of Restoration (2005): Barış Ali Timur, Figen Kıvılcım, Gürem Özbayar, Ilgın Önal, Mert N. Rifaioğlu, Ömer Ünlü, Özgür Şenoğul, Pınar Aykaç, Sermin Çakıcı, Uğur Gürsoy, Zeynep Kutlu, Prof. Dr. Neriman Şahin Güçhan, Assoc. Prof. Dr. Emre Madran, Assoc. Prof. Dr. Güliz B. Altınöz, Resst. Asst. Nida Naycı

Figure 3.6. Ayvalık Building Categories Within Commercial Area Near Seaside (Yıldız, 2017)

The historic industrial region is mostly located on the western part of Barbaros Caddesi through the vertical streets crossing it and the streets parallel to seashore on the westbound part. On the northern part of city square, that industrial region getting slenderized and buildings are starting to converge to waterfront.

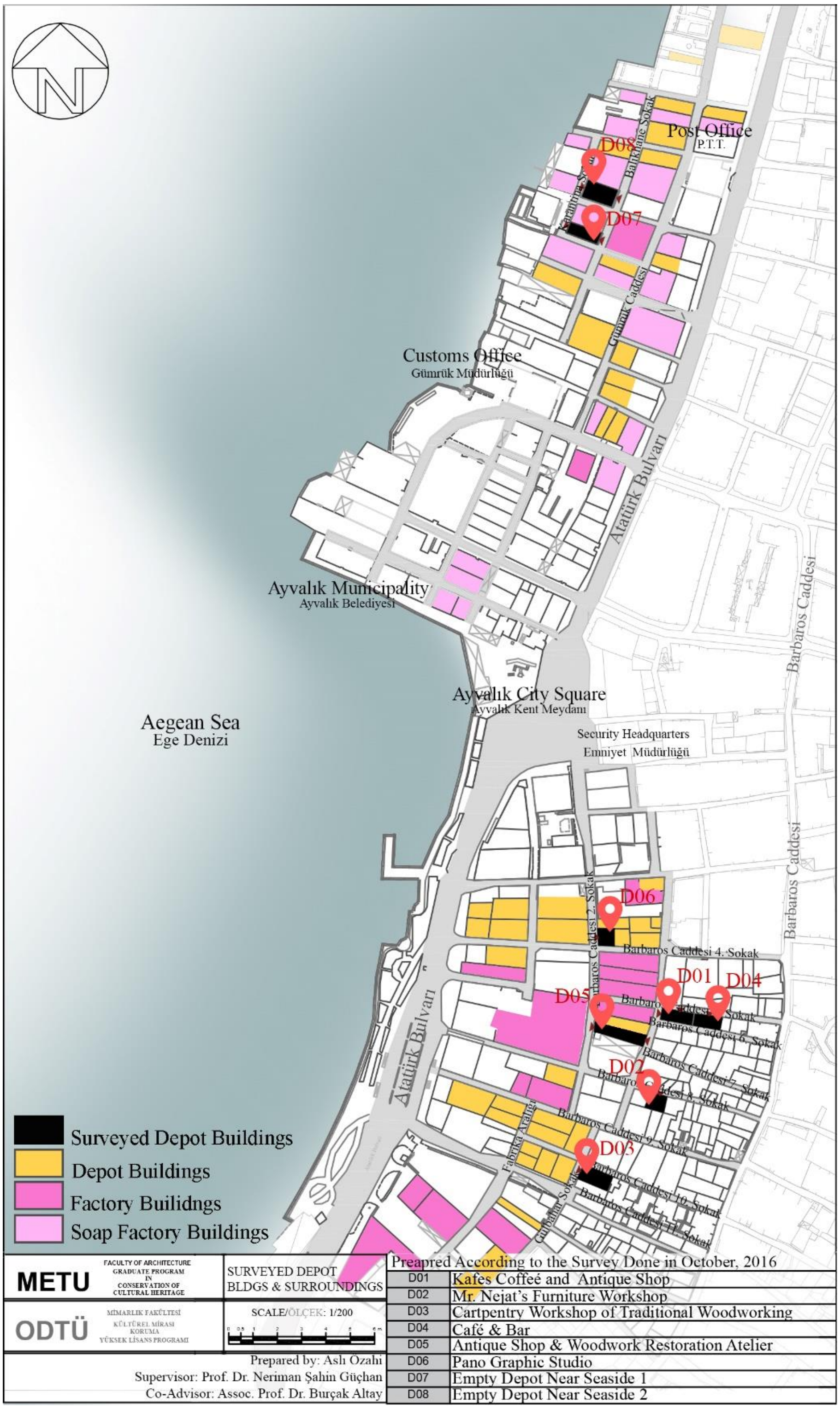


Figure 3.7. Building Functions Around Surveyed Depot Buildings within Ayvalık Commercial Area (Elaborated from: (METU Graduate Program in Restoration,-REST 507-Design in Restoration 3 Studio, 2005), (Yıldız, 2017)).

(Figure 3.6) In spite of the clustered and grouped buildings in traditional pattern near seashore, there are also some depot buildings which spread individually across traditional residential area.(Figure 3.8)

According to those studies had done in 2005, industrial buildings were categorised and depot buildings typologically categorised as A1a, A1b, A2a and A2b. (Figure 3.11) This typology was made with respect to number of storey, location of the building in the lot, plan type and façade type of entire building inventory of their study area.

Depot buildings are single spaced, one storeyed, hipped roofed or gable roofed stone masonry buildings with one or two entrances. If they have gable roof, a pediment on the front façade can be seen. Some of them have mezzanine floors with respect to their floor height. Those are the representative buildings in the urban fabric of Ayvalık with their large numbers and repetitive elements like façade organization of entrance door and windows. (Özbayar, 2014, p. 51) (Figure 3.10)When structurally analysed, those buildings built with stone masonry technique with squared rubble stone and lime mortar used for binding them. In some masonry types, traditional brick pieces used between "S*arımsak stone*" masonry. Pinkish-coloured ",*Sarımsak stone*" is a volcanic, porous tuff stone which is damp resistant quarried from Sarımsaklı peninsula of Ayvalık. Some of them are coursed and on the edges of building there are cut corner stones for the finishing of façade. Cut stone also used for defining openings.

In addition, a few examples are existent as front facades built with traditional brick masonry with lime mortar. Almost on top of the all openings, spanning made with brick arcs but in some window types, bigger cut stones have seen as a plain lintel on the façade at door opening while there is a brick arch on top of it or at the inner surface. On the other hand, to cover the roof of rectangular buildings timber truss systems are used. Trusses are located on load-bearing walls which have thicknesses between 40-55 cm. They can be seen as hipped and gabled roof type which formed by timber trusses. Almost none of them have gutters and the existing gutters are later additions to roofing structures of buildings. Another property of those buildings is, it has known

Figure 3.8. An Empty Depot Building Located at Residential Area (Özahi, 2016)

that, some parts of the original flooring was covered with earth. In 18th and 19th century clay vessels which called “kioupi” or “küp”[12] by owners and workers in olive-oil mills and oil warehouses used for the trade and storage of olive and olive products (Blitzer, 1990). There are some photographs form Ayvalık showing how in situ storage jars for olive oils located in earth (Blitzer, 1990). In the present stage, any of observed buildings have those kind of in-situ kioupi inside earth floor covering.

[12] Owners and workers in olive-oil mills and oil warehouses along the west coast of Anatolia were consistent in calling these vessels "kiipler, Midilli'den" ("pitharia from Mytilene"). The term kioupi, used instead of pithari throughout the Dodecanese and in some of the Cycladic islands, is a Greek variation on kiup (Blitzer, 1990).

Figure 3.10. Repetitive Elements of Depot Buildings on the Streetscape of Ayvalık (Özahi, 2016)

Figure 3.10. Eastern Aegean Storage Jars (Kioupia) at an Olive Oil Depot Building in Ayvalık District (Blitzer, 1990, p. 112).

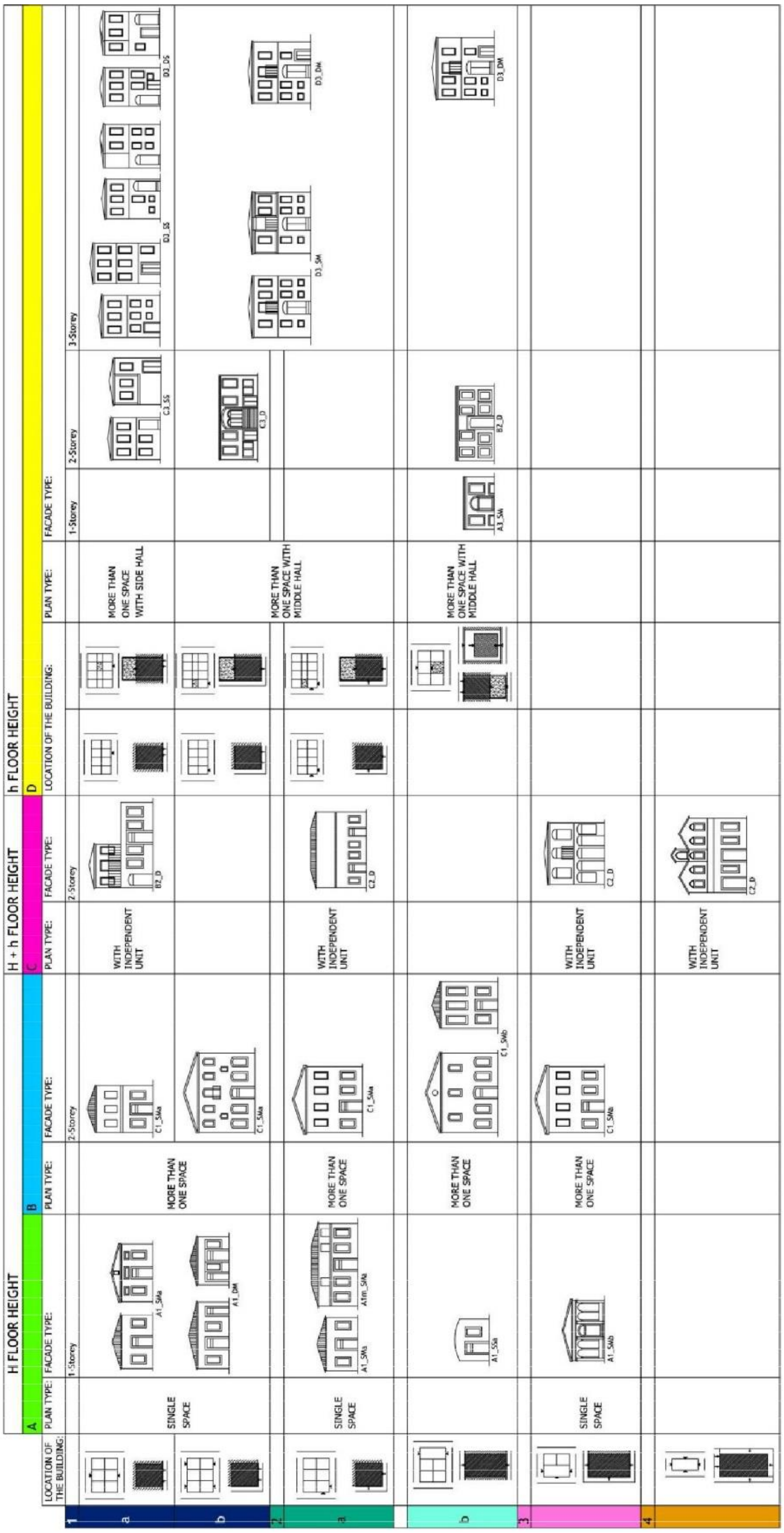


Figure 3.11. Building Typology (Conservation Project for Ayvalık- Depots Region, METU,2005)

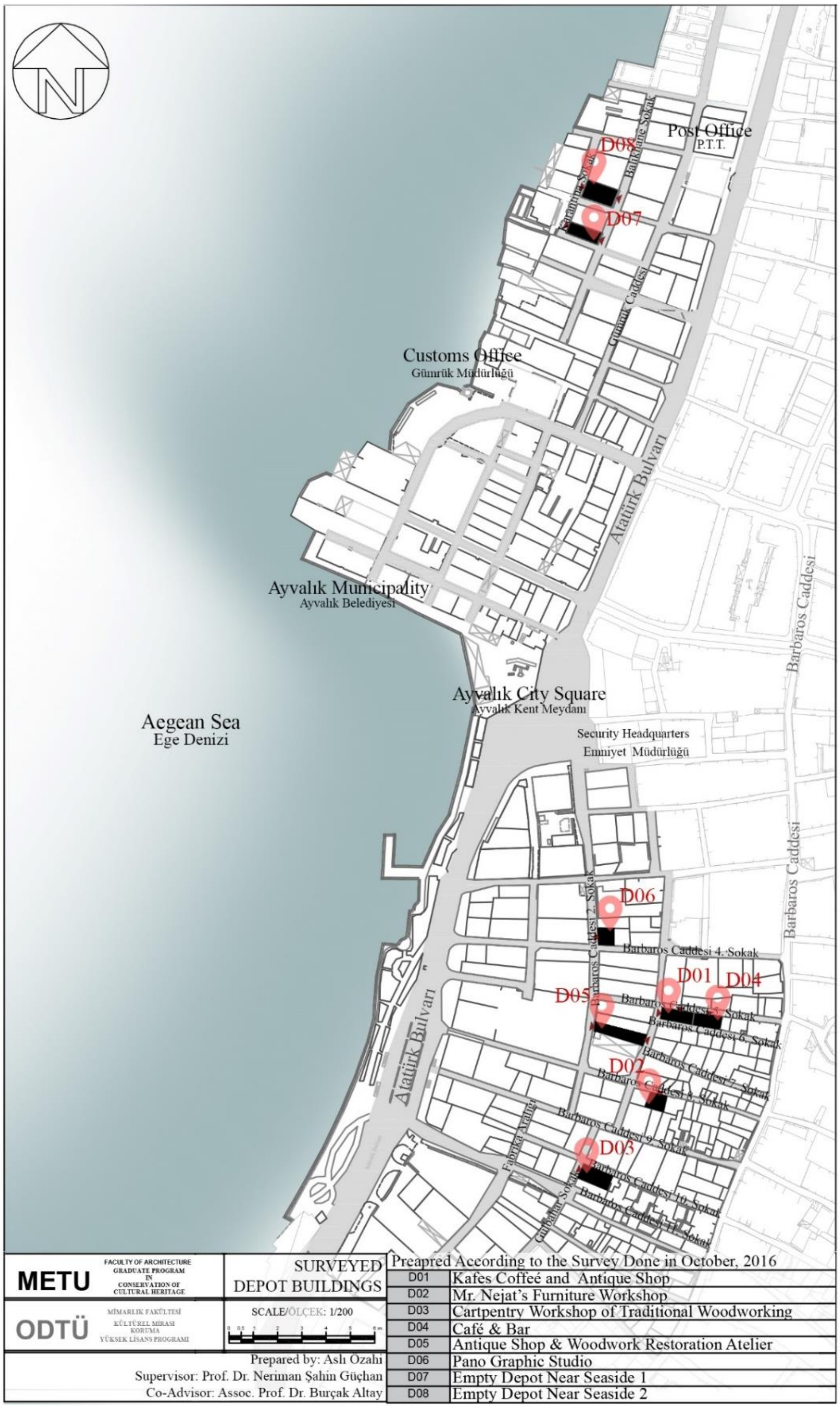


Figure 3.12. Surveyed Depot Buildings in the Scope of Thesis

3.1.1. D01 Cafe'S Coffee and Antique Shop

This depot building built on approximately 77.2 m² building lot. It covers the whole lot and it is a registered building at present state. (Figure 3.13,A) Its front façade is facing Gülbahar Sokak and the open address of building is Barbaros Caddesi 6th Street No:8, Fevzipaşa-Vehbibey Mahallesi, Ayvalık. The block number is 429 and the lot number building stands is 5. The front façade has generated with symmetrical two window openings and a door opening on the central axis of building. (Figure 3.13,C) It has a quadrangle shaped plan. From the entrance, the first place inside building is G-01 which some antique pieces exhibited. Passing through partition wall in G-02, a small open kitchenette is existing to brew coffee or tea. In G-02 another entrance to building and a wet space also existing. (Figure 3.13,C)

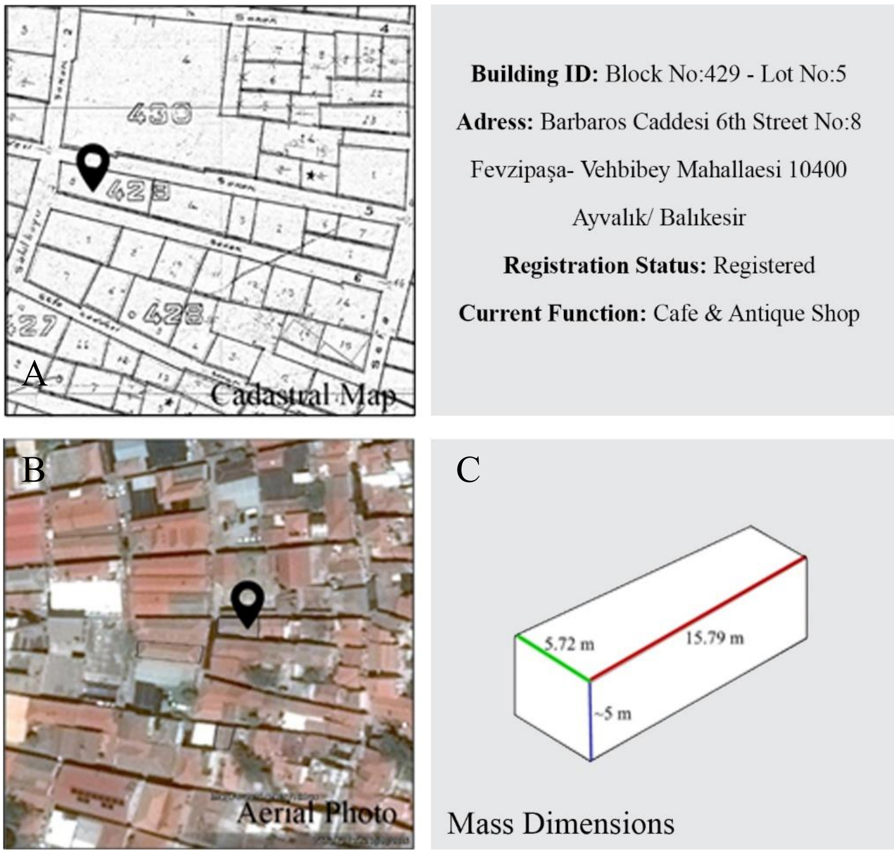


Figure 3.13. Cafe'S Coffee and Antique Shop, Image A; Location of D01 on Cadastral Map, Image B; Location of D01 on Aerial Photo (Google Earth last accessed on 25.09.2017), Image C; Mass Dimensions of D01

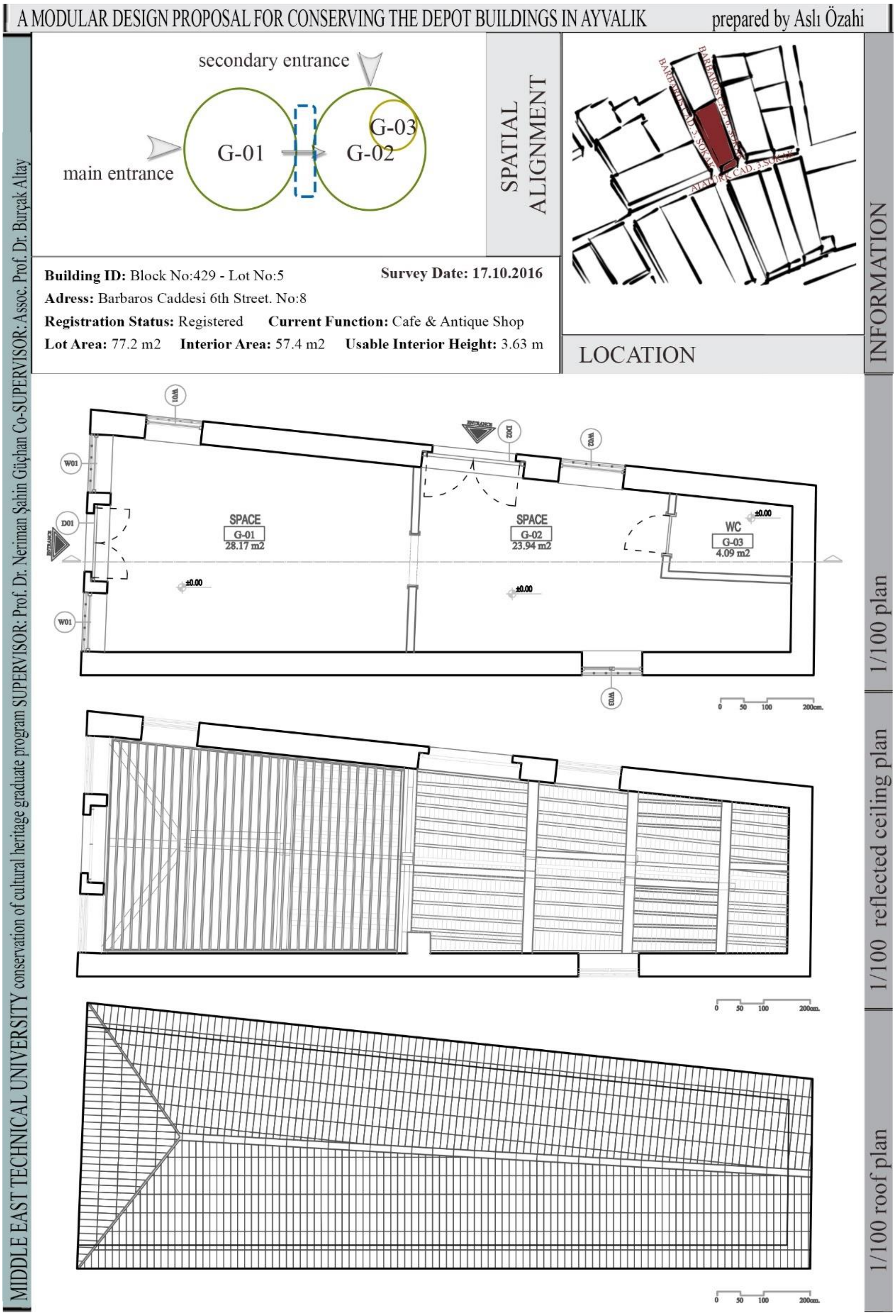


Figure 3.14. Survey Drawings of D01

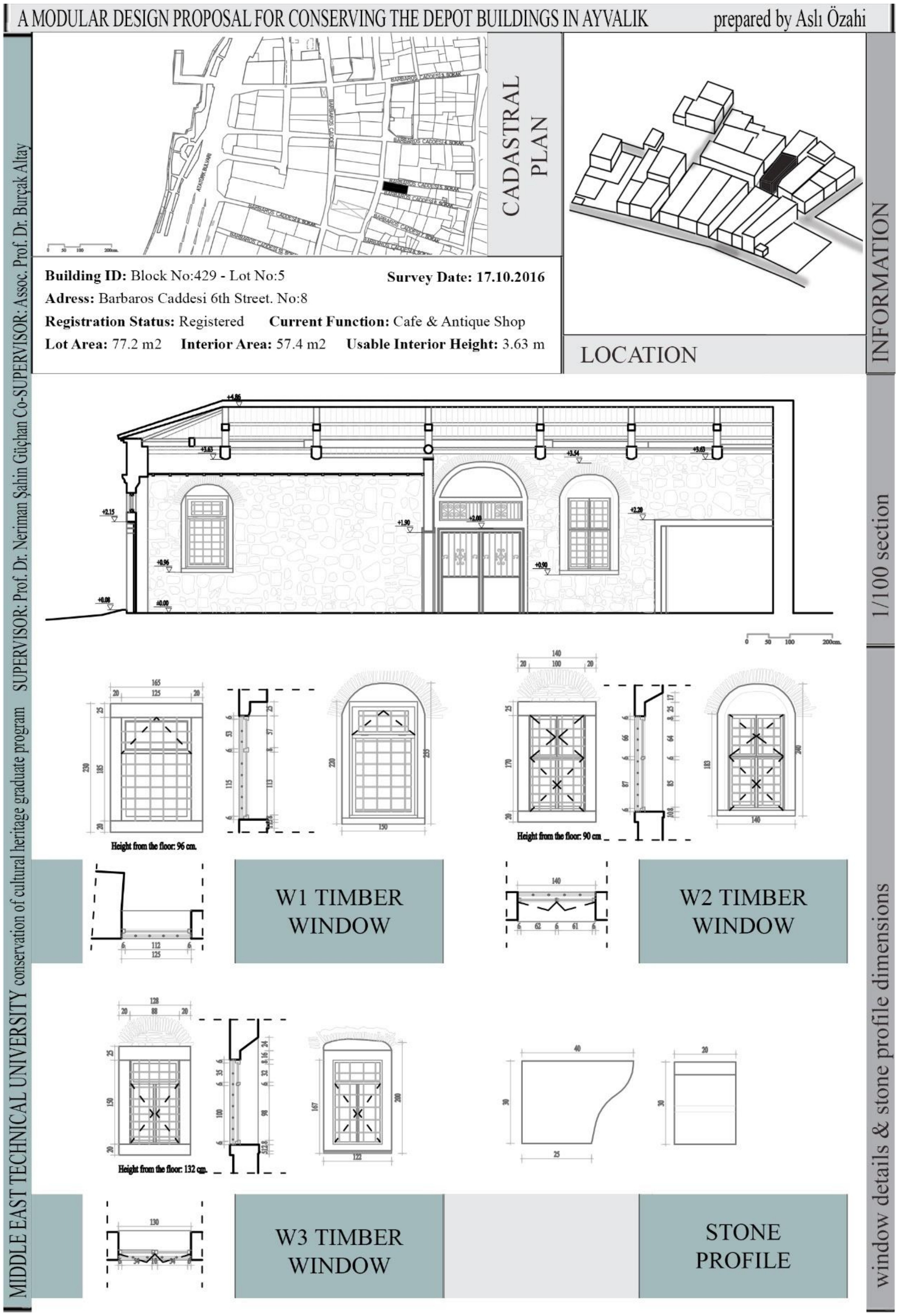


Figure 3.15. Survey Drawings of D01

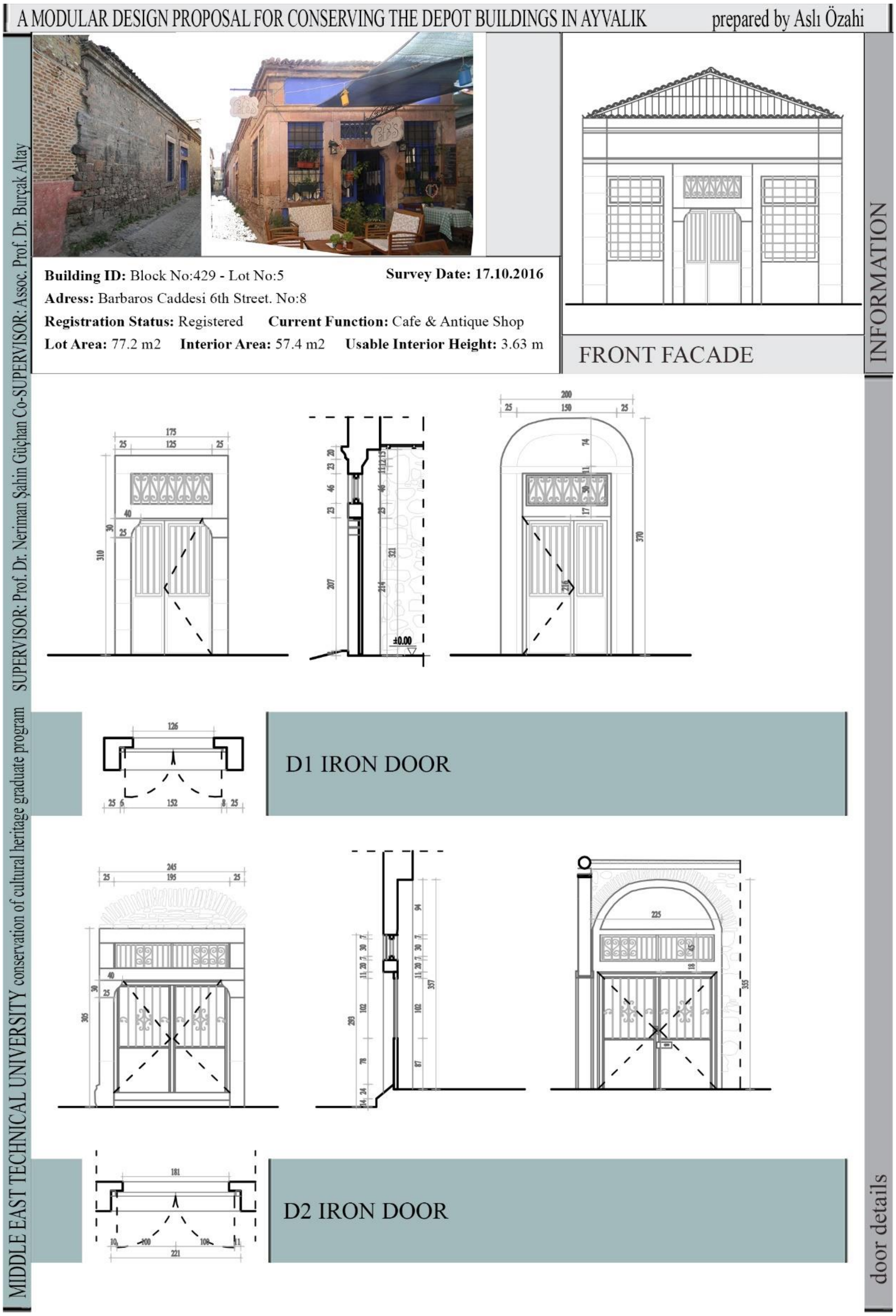


Figure 3.16. Survey Drawings of D01

a. Structural Characteristics of D01

The wall thickness of masonry load-bearing walls is 45 cm and they were built as uncoursed squared rubble masonry with lime mortar binding. At the quoins of building large well-cut cornerstones were used. On the front façade masonry part of wall cladded with thin stone slates and at some parts plaster as finishing applied. Local stone called "Sarımsak taşı" was used as masonry element and at some parts of wall, traditional bricks also are used. Brick usually used on the upper part of window openings both as arched lintel and as brick masonry wall. Another structural element of stone masonry wall are torsion bars which are iron pre-tensioned elements for stabilizing the stones over the masonry walls. (Figure 3.17)

There are two kinds of partition walls in that building which create sub-spaces for functional purposes. The one which divides building into two has a 20-cm thickness and an opening in it to allow people to pass through. The material couldn't be observed because of the plaster finishing. The second partition wall has a 15-cm thickness and it was for creating a wet space. Like other one this also covered with finishing inside with ceramics and outside with plaster so the inside materials couldn't be observed. A trussed roofing system used for protecting from outdoor climate conditions. It has a

Figure 3.17. Tension Bars Used in D01

gabled roof with three surfaces. The main elements of this kind of system are posts, beams, collar beams, purlins, rafters, ridge purlin and roof board which create trusses, can be observed from inside. It has 6 trusses which have beams approximately 25 cm thickness. As roof tiles, over and under brick tiles were used. This system split the load of the roof to the load bearing walls with horizontal beams and rafters. The observable floor covering is 30 x 30 terrazzo ceramic tiles. Whole floor covered with those tiles and there is no elevation difference inside the building. At the entrance till the partition wall a wooden lathed plain ceiling covering was used. Ceiling boards nailed to each other with laths and they placed horizontally or also nailing them to horizontal roof beams. It has a smooth finish, so the system couldn't have observed. On two vertical sides as junction detail wooden cornices used.

b. Architectural Elements of D01

Architectural elements of this building are basically doors and windows. There are two doors on different facades and total number of windows is five. The main door D1, is on the front façade and door opening is 200 cm wide and 370 cm height. (Figure 3.18,A,B) It has a transom window with 50 x 125 cm window opening on it and from inside, hidden arched lento can be seen. The stones which created jambs covering doors have 25 cm thickness. Second door of building D2, is on the left-hand side façade of building which is not used as much D1 used. (Figure 3.18,D,E) It has an exposed brick work arched lento from inside and outside. Both have cast iron door with glass and ironwork on them. Moreover, stone profiles over stone columns on two sides of door are important architectural elements of this depot building which gave the actual neo-classic style with the help of colonnades and arched lentos. (Figure 3.18) The opening height of D2 is 355 cm and width of the opening is 225 cm. There are three types of windows in this building. This typology is made according to their proportions, their height above floor inside the building and timber framed window type of them. In all windows, iron bars are existing. Also, all windows have stone jambs around them and completed with stone sills under the timber window frame. W1 type window is a timber framed non-sashed window which has an operable transom window above. (Figure 3.19,A) Opening dimensions are 150 cm x 255 cm. Their height above floor level is 96-98 cm from inside. This type of windows is used three times in building, two of them on the front façade and one of them is on the north façade of the depot building. The two which located on front façade, have hidden arched lento which observed from indoor plastered wall. Third window in W1 type has an exposed arched lento from both sides. Opening dimensions of W2 are 140 x 240 cm. (Figure 3.19,B) It has sashed timber framed windows which divided into four from the middle. It is 90 cm high from floor level. W3 type windows basic difference from other window types is the highness from floor level. It is 132 cm high from floor level when measured from inside the building. It is a typical sashed window with non-

Figure 3.18. Photographs of D1, D2 and Stone Profile of D1, Image A; Exterior View of D1, Image B; Interior View of D1, Image C; Exterior View of D2, Image D; Interior View of D2, Image E; Stone Profile of D1

Figure 3.19. Window Types of D01; Image A: W1 Type Window of D01, Image B: W2 Type Window of D01, Image C: W3 Type Window of D01.

operable transom window over it. (Figure 3.19,C) The dimensions of the opening of window type W3 are 122 x 200 cm.

c. The Story of The Building D01 And Its Change

Depot building dated back to late 20th century and constructed in neo-classic style. The exact construction date of the building is unknown. In 2007, building was not in use. (Terzi, 2007, p. 181) It was used as a fishing depot according to the declaration

Figure 3.20. Photographs Taken by the Present Inhabitant Before They Moved in to Building D01.

of the present user, before they moved in this building. In between those two functions it stayed as an abandoned building. Photographs shown in Figure 3.20 are from an abandoned state of building after used as a fishing depot. It can be seen from that state that all walls are plastered beforehand and on the entrance walls, there are ceramic wall finishing up to a height. Also, there was a door opening at the place of a window when it was used as fishing depot and one of the windows was closed with brick laying to the opening.

The spatial alignment had changed in an unknown date and big depot space divided into two with a space partition under one of the beams of the roof. It is supposed that beforehand the original building did not have any partitions as an olive oil depot.

Figure 3.21. D01 Building in Different Years; Image A: Photograph taken in 2007 (Terzi, 2007, p. 181) Images B,C: Photographs taken by the Present Inhabitants Before They Moved In to D01 (Sent to Author in 08.12.2016), Image D: Photograph taken in 2016 by Author.

The present inhabitant of the building is a retired architect who now is the café owner. They are managing there with his wife and they moved to Ayvalık from Istanbul. Photographs mentioned above are gathered from the inhabitants of building. Figure 3.22 below is showing the total change of building and changes itemized in detail below it.

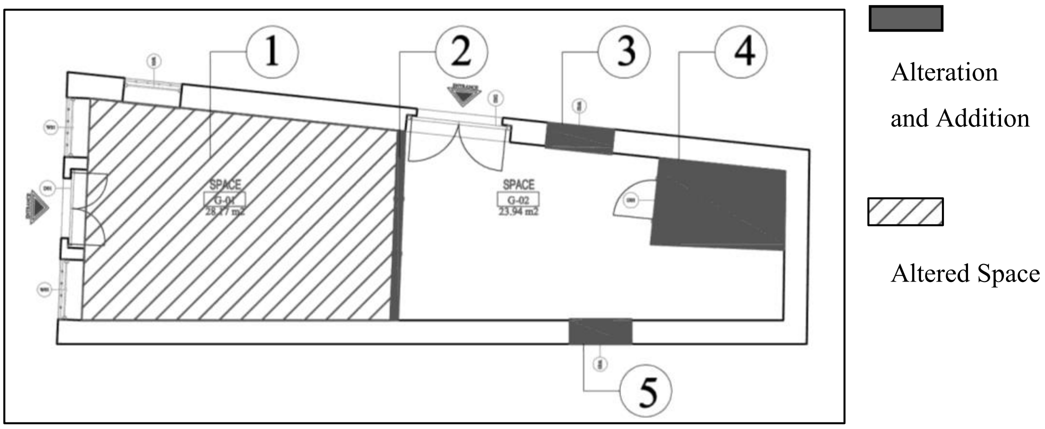


Figure 3.22. Figure Showing a Mapping of Observed Alterations on D01

1. Wooden Plain Lathed Ceiling
   This alteration was made in an unknown date after the building used in its original function. It creates a cosier entrance with decreasing the ceiling height to 3.20 m. The original height of the roof beam is at 3.63 m.
2. Partition Wall
   With this alteration, rectangular long building divided into two for creating more space for different functions. The reason and the date of this additional wall is unknown.
3. W2 Alteration

This window was used as a door which altered from a window again beforehand. Its height from floor was not altered when it changed into a door, but the original frame has gone. It is now altered to a window again with the same opening dimensions as 140 cm x 110 cm.

4. Addition of Wet Space

   A functional need wet space is a main need for a building to be in use. As this building is not used as a depot anymore a need for that utility was added when it was used as fishing depot. We can see a smaller version of that wet space from a photograph taken before latest alterations done.

5. W3 Alteration

   This window altered by removing the brick arch from the window opening and adding a wooden window frame to that opening again. Dimensions stayed the same as before, so the proportion has not changed but, framing is different from the original window framing which couldn't be observed.

6. Wall Finishing Alteration

   At the present state of building, only two walls have plaster finishing on stone masonry walls. Though, when it was used as fishing depot all walls were plastered. Inhabitants who reorganised the building remove almost all plasters and use the walls in their original texture.

d. Assessments on The Building D01

The building has no any structural problem But, in some parts of the building there are some dampness problems. The most important cause of this problem is lack of gutter on roofing system. Getting rid of excess water while raining is the most important problem of this traditional building. Dampness can be seen on the structural elements of roof, on roof boards, rafters and collar beams. (Figure 3.23,B,D) Because there is no plaster on most of the walls, dampness couldn’t be observed most probably because of the evaporation process of water from mortar. But before present inhabitants of the building, on plastered parts dampness traces can be seen. (Figure 3.23,C) The purpose of construction of the building is totally different from the todays use and so insulation is not a problem to be solved in those times. But now, it became a problem to be solved for the later inhabitants of this building. On the other hand, lighting fixtures of this building don’t fulfil the needs of the building and are not

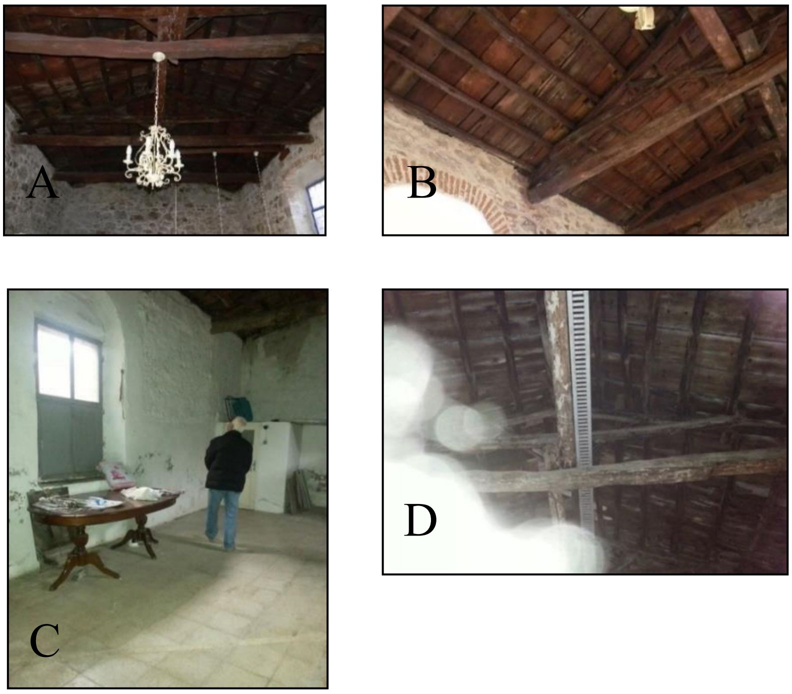


Figure 3.23. Problems Seen at the Upper Parts of Building D01 on Structural Roof Elements and Masonry Walls.

suitable with the general structure of building. Some of them fixed directly on the masonry walls which are dangerous for this historical building and others fixed to the roofing elements. (Figure 3.23,A) Another problem of the building is basically not the problem of building but a ventilation problem of the wet space inside in it. It can be counted as a problem for building because if this building is going to be used, it should have a wet space which compromise the needs of inhabitants. The wet space has 4 m^2 area which can be a non-objectionable size, but it doesn't have a ventilation opening to outside.

Right along with those problems, there are many potentials this building embodied. First, having no structural problem on this age of a building is an important potential of a building which shows its durability and strength. Its thick stone masonry walls are standing so hard to many interventions and inhabitants which is giving a clue about future potentials of it. In the second place, the dimensions of the suitable use area it contains is an important potential for the future functions of it. The building is now hosting two functions at the same time but, in a very low rate of efficiency. This also indicate the functional potential of building. Depending upon the user interventions another potential arise which is the reversible alterations of earlier inhabitants. Some of the additions and alterations which made by past inhabitants are not permanent like addition of wet space or division of the whole space into two with a partition wall. The removal of this kind of alterations can bring the wholeness of building and this also brings a potential to building. Among all those potentials, a potential that only this building has is, having three facades on three different streets which makes it a crossing area. This adds a locational potential to building among others.

Cafe'S Café and Antique shop is now a commercial functioned building but, it is as a building a resemblance of the production system of its own period. Being in a district like Ayvalık, which had an industrial history based on olive and olive oil and being a building among a collection of olive oil factories, depot buildings, this building is a typical depot building which gains its value from the commonness. It has traditional value coming from its construction technique, façade type and planimetric shape. The neo-classical elements like stone door profiles, colonnades among two sides of the door at front façade, arched lentos with brick work above windows and doors are the similar elements. This kind of buildings are so common in the area, which are elements composing traditional pattern.

3.1.2. D02 A Furniture Workshop

This depot building is built on 74.65 m² total area and building cover the whole lot. It is a current registered building. Front façade is facing 8th Street and depot is located between two adjacent traditional buildings. Open address of D02 is Barbaros Caddesi 8th Street No:15, Fevzipaşa-Vehbibey Mahallesi, Ayvalık. It is located in the block numbered 324 in cadastral map and the lot number of the building is 12(Figure 3.24,A) The front façade is symmetrical with two windows each side and at the centre a door

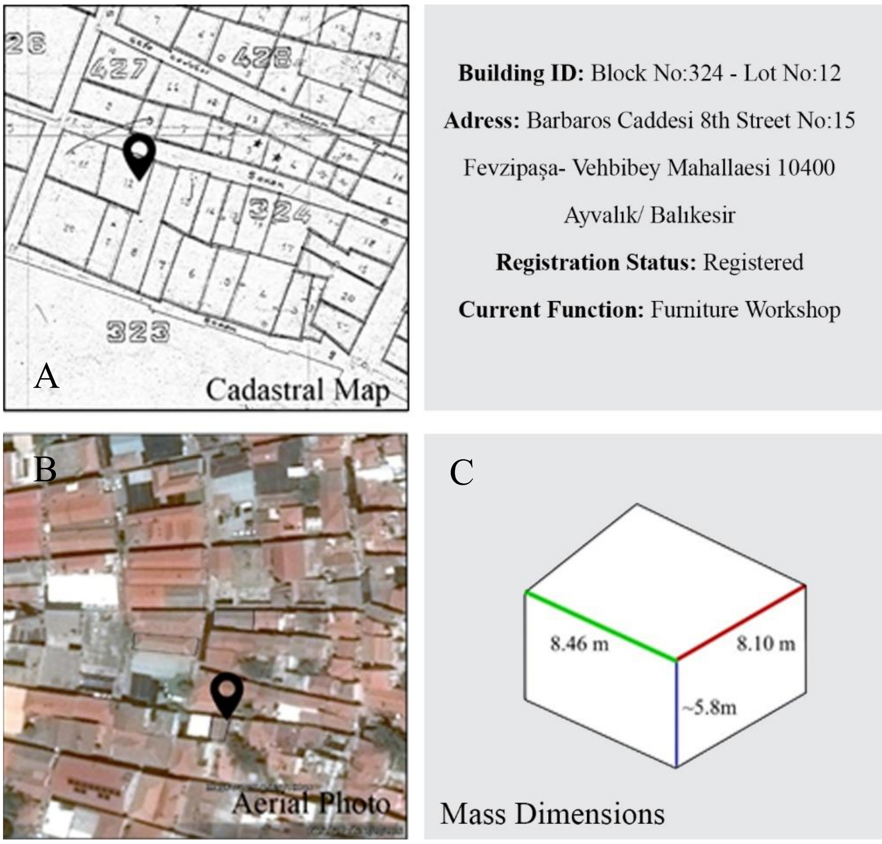


Figure 3.24. A Furniture Workshop, Image A; Location of D02 on Cadastral Map, Image B; Location of D02 on Aerial Photo (Google Earth last accessed on 25.09.2017), Image B; Mass Dimensions of D02

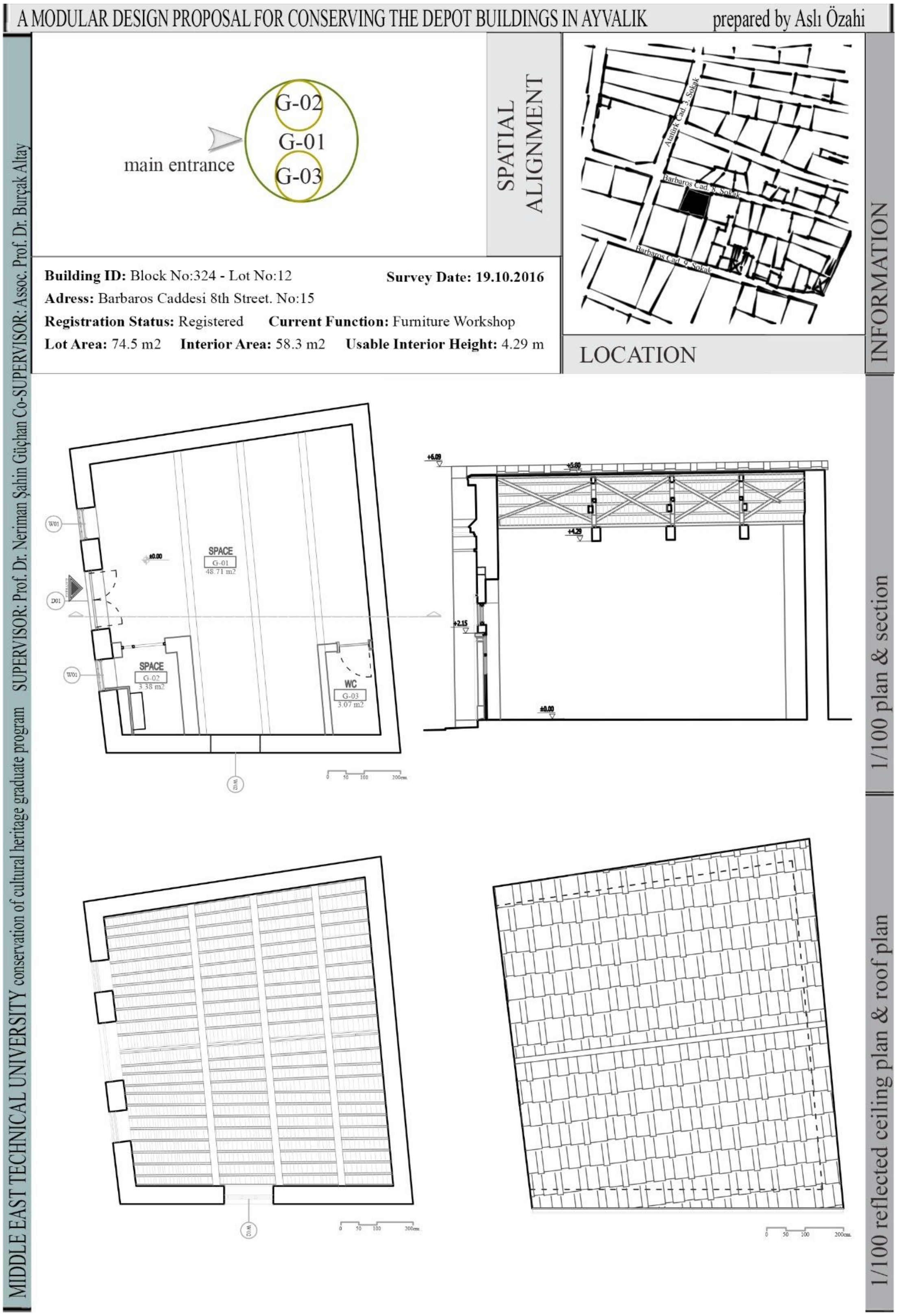


Figure 3.25. Survey Drawings of D02

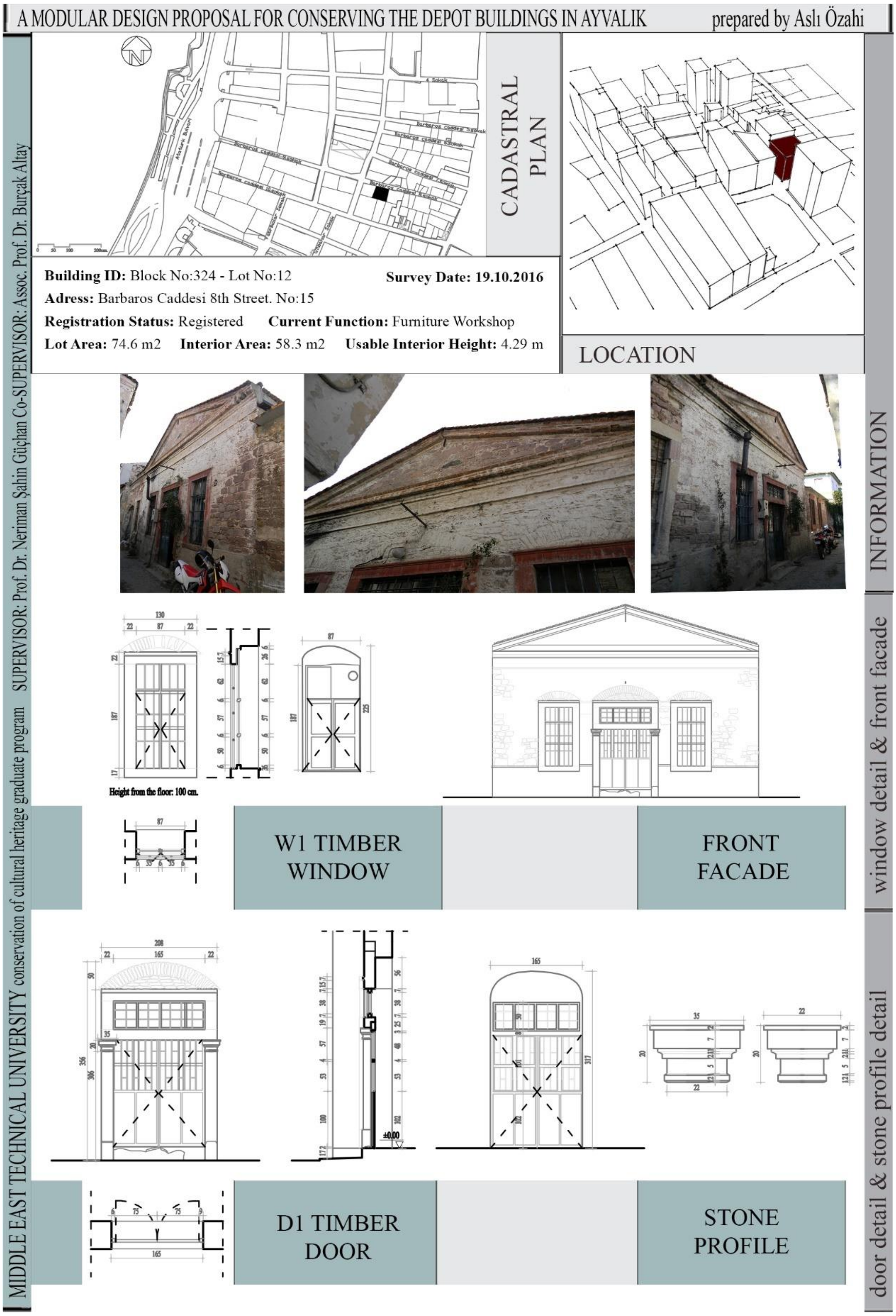


Figure 3.26. Survey Drawings of D02

to carpenter with carpentry devices and storage areas. There are two separated spaces from G-01. G-02 is a small office space which inhabitant puts his personal belongings and welcoming his costumers. G-03 is the wet space of building. (Figure 3.24,C)

a. Structural Characteristics of D02

Wall thickness gathered from the door opening is 50 cm. Other walls are adjacent to other buildings so any other dimension couldn't have gathered. Stone masonry is exposed on the front façade. Uncoursed squared rubble masonry with lime mortar used as a masonry technique. Some parts of front façade are painted and up to window sill height, plaster used for covering exposed masonry view. Masonry is made from local stone and at upper parts of building brick seen in cornice and around pediment. On the pediment, another structural element iron tension bar was used as stabilizer for the stones not to detach. (Figure 3.29,C)

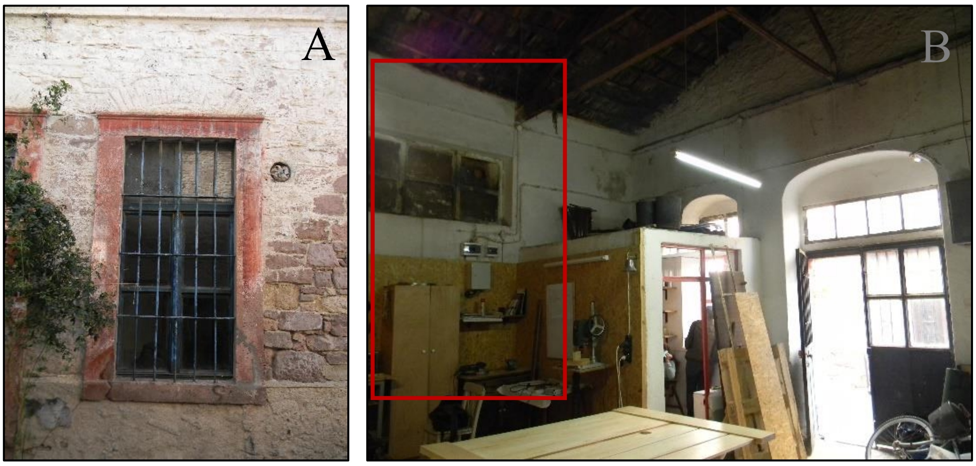
Partition wall thicknesses varied from 22 cm to 40 cm. The one which used for creating wet space has a 22-cm thickness. It was built with 19 cm hollow brick and from outside plaster applied and from inside ceramic tile used as finishing. Other partition wall is for creating an office space with wooden skeleton and thickness

Figure 3.27. Image A: Later Added Gutter for Getting Rid of Excess Water, Image B: Structural Roofing Alterations.

differs among two walls between 30 cm- 40 cm. As finishing plaster and OSB panels are used. Building has a wooden trussed gabled roof. A system which divide roof load into wall was formed by posts, beams, collar beams, rafters, bracing and cross bracings. Roof board and interlocking roofing tiles are other elements of roofing system. The trussed system composed of 3 main trusses which have 20 cm thickness beams. There are some altered roofing boards and bracings. (Figure 3.27,B) A gutter can be seen from front façade but continuity of it through the end of the roof couldn't observed in field study. (Figure 3.27,A) In current state, a concrete screed as floor covering has seen. The original floor covering couldn't be analysed.

b. Architectural Elements of D02

This building has two windows at the front façade. Those windows are labelled as W1. (Figure 3.28,A) 87 x 225 cm dimensioned W1 windows are the only light and ventilation source of building. The height from inside floor level of those windows are 100 cm. Another window type which located on a higher floor level is the transom window which is an opening between this building and the building next to it, called



W1 TYPE W2 TYPE

Figure 3.28. Window Types of Building D02; Image A: W1 Type Window on Front Façade, Image B: Interior Window W2

W2. (Figure 3.28,B) The dimensions couldn't be examined on the field study because of the height of the window and dangerous timber shaping devices which inhabitant have stored them on the related wall. The entrance door of building is called D1 is a cast iron door. (Figure 3.29,A) It has a non-operable transom window over it. Arched lento of the opening is exposed on two side of façade wall. The fill-in which laid on the gap between arch and transom window and the arch itself are created with using brick work. The width of the opening 165cm and the height is 317cm. D1 has two stone heading profiles on both sides of the iron door on colonnades. (Figure 3.29,B) According to the conversation with the present user, a door is located under the transom window exists but, it is a closed door with OSB panels as he need a more finished state for his work place. This door is called D2 but, any information is found about it in the field survey. Another architectural element for this building is the pediment, which adds rareness value to the building. (Figure 3.29,C) It is a very important element which directly affect the front façade with its brick used three edges. The fill-in between those triangular field is stone masonry.

c. The Story of The Building D02 And Its Change

A late Ottoman period olive oil depot building which has a neo-classic style with its triangular pediment, exposed masonry with Ayvalık's local stone and symmetrical façade with stone sills. This building is used as a furniture workshop by a carpenter designing modern furniture pieces. There is no traditional production in that

Figure 3.29. Some Architectural Elements of D02; Image A: Photograph of D1, Image B: Stone Profile Which Stands on Both Sides of D1 on Stone Colonnades, Image C: Pediment of the Building D02.

workshop. Previous function of the building before carpentry workshop is unknown but, it is known that a window and a door which connect this building to adjacent building opened in an unknown date. Those two buildings were worked together at a time in the past. At present state, door closed by the user with an OSB panel and window is still open but blinded. Total additions and change are itemised below. Those are the change marks identified in field study.

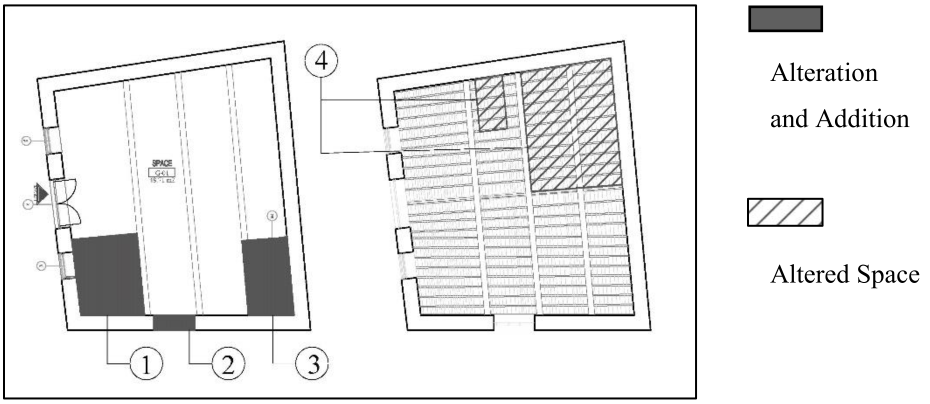


Figure 3.30. Figure Showing a Mapping of Observed Alterations on D02

1. Spatial Addition

   This spatial addition is 3.38 m² place which divided from the main space to eliminate an office space for the present user. The material used for constructing this area is wood which generate a skeleton. The infill is unknown but, plaster finishing and paint can be observed.
2. A Later Window and Door Opening

   A fact that this building and the building adjacent to it worked together at a previous time in the past. An OSB panel closed the door at current state. The window is blinded because those buildings are in separate use.
3. Wet Space Addition

User need is an important issue so, with hollow brick construction a wet space separated from main building space.

4. Roof Board and Roof Elements Alteration

   Some parts of the roof boards and bracings are altered with new timber elements. (Figure 3.32,A-B)

d. Assessments on The Building D02

Although building do not have any structural problems, dampness problems can be seen on plastered walls and on roof elements. (Figure 3.31,A-B) Some roof boards and bracings changed but damaged timber roof elements can be seen. A gutter exists but still excess water accumulation on roof is a problem for that building. (Figure 3.27,A) Beside this, there is a lack of ventilation of the wet space which is an essential point for a hygienic wet space. There is no opening for ventilation to outside and this cannot be acceptable for suitable building conditions. In addition to this lighting of whole space is made with florescent lamps which hang through roof elements. Although, general lighting is not enough for the whole area, the way inhabitant uses them is acceptable as they are flexible and removable without giving any harm to

Figure 3.31. Detached Plasters on Upper Parts of Stone Masonry Walls Which Indicators of Dampness Problems Caused by Water Accumulation on Roof.

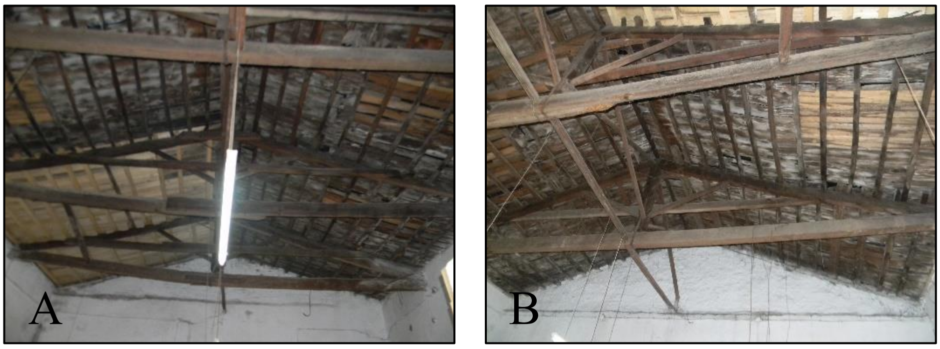


Figure 3.32. Altered Roofing Elements of D02

building. The absence of a structural problem creates a very important potential for the building.

A second potential of this depot building is being adequate for one or more functions which the highness of the ceiling provides. On the other hand, past interventions which intended for future inhabitants were not permanently harmful for the building that it provides a good potential for other users in the future. Building is a part of traditional street view and it is a rare example within other depot buildings with its pediment. Those facts are potential benefits for the future users and Ayvalık in an environmental scale. They are also enriching the value of the building. The originality of the front façade without much change and rare elements are the most important values. It is one of the unique examples among other typical depot buildings and a contribution to the traditional value of Ayvalık's traditional industrial pattern with the construction technique and façade type.

3.1.3. D03 Carpentry Workshop of Traditional Woodworking

The total area this depot building covers is 90.14 m². Building doesn't cover the whole lot. It has an empty area on the backyard of it. (Figure 3.33,A) The open address of D03 is Gülbahar Street, No:3, Hayrettin Paşa Mahallesi, Ayvalık. Block number

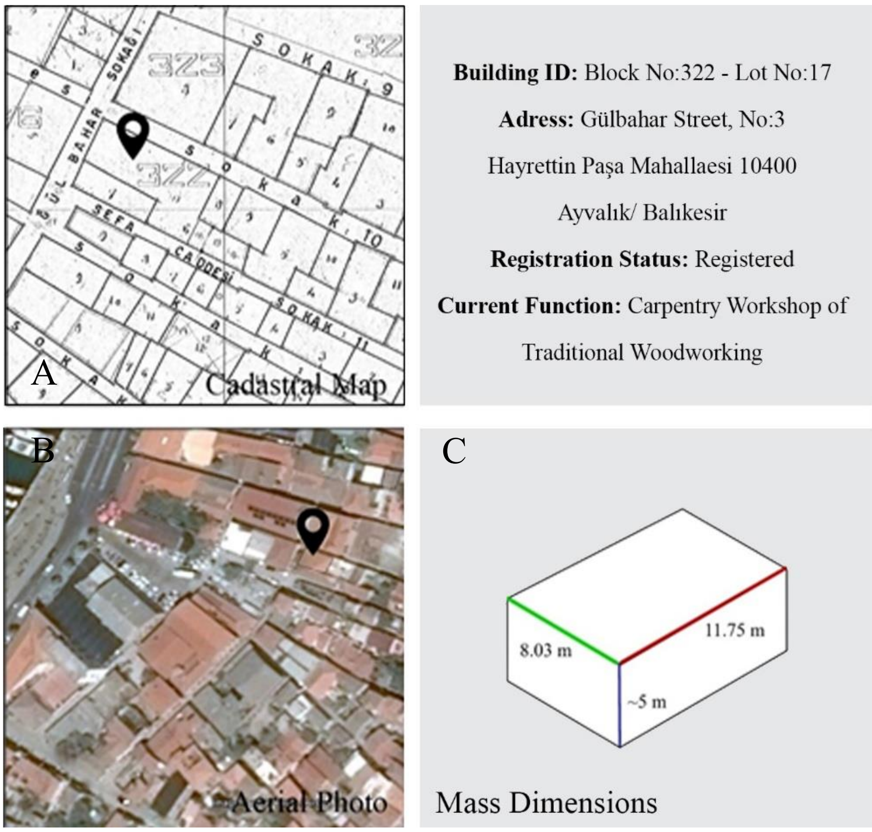


Figure 3.33. Carpentry Workshop of Traditional Woodworking, Image A; Location of D03 on Cadastral Map, Image B; Location of D03 on Aerial Photo (Google Earth last accessed on 25.09.2017), Image C; Mass Dimensions of D03

which building located is 322 and its lot number is 17. (Figure 3.33,A) D03's front façade is facing Gülbahar street. Left hand side façade is facing 10th Street and the edge of building is also the edge of the crossing of two streets. It has a symmetrical façade with a door at the centre and on both sides, windows are existing. (Figure

3.33,C) On the front façade, an ivy type of plant covers a part of the façade. The whole area G-01 is used by the inhabitant of building and with a semi private partition a semi-private space was separated from the major area which labelled as G-02. (Figure 3.34)

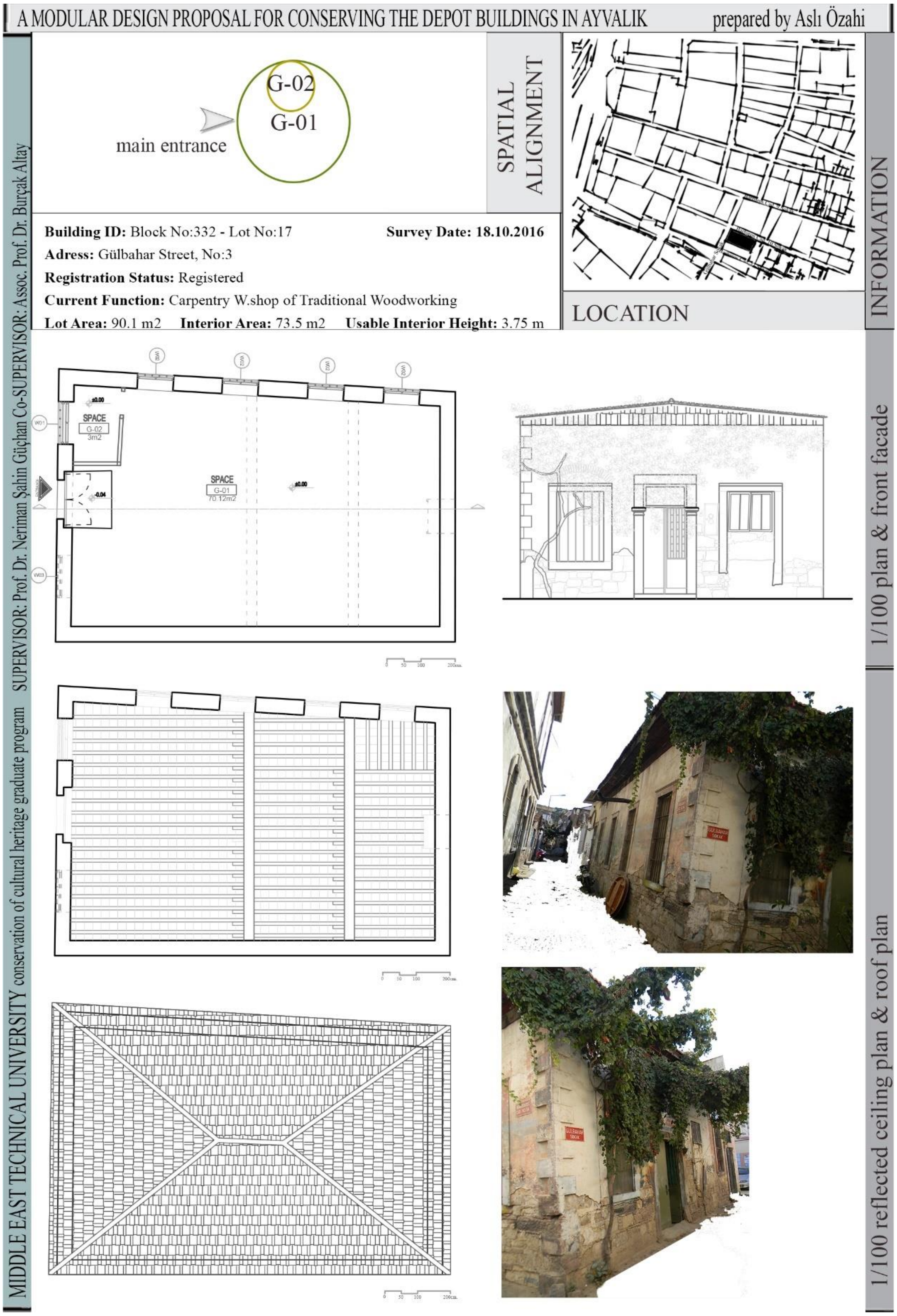


Figure 3.34. Survey Drawings of D03

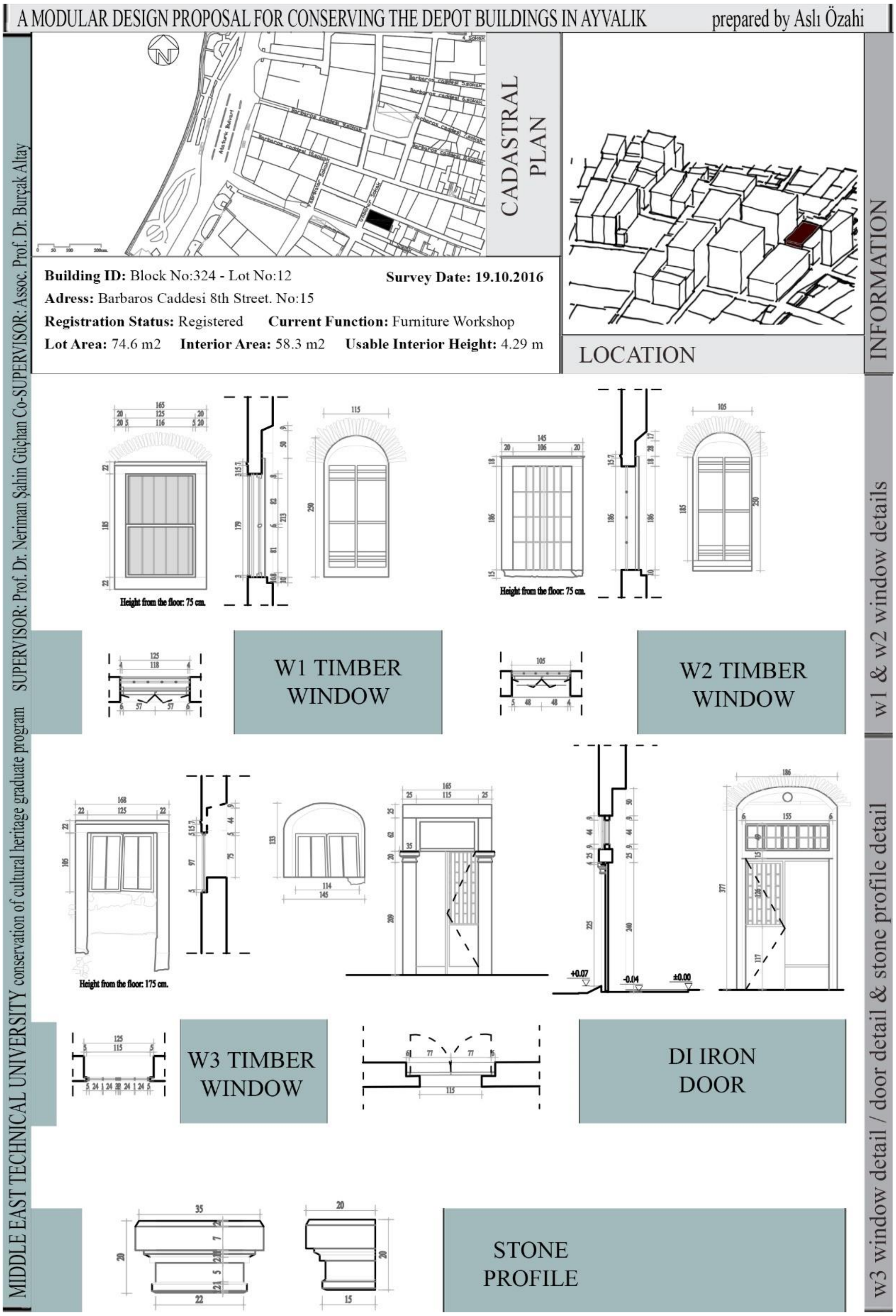


Figure 3.35. Survey Drawings of D03

a. Structural Characteristics of D03

This building has stone masonry load-bearing walls which two of them are adjacent to other buildings next to it. It stands at the corner of crossed streets. The quoin which stand at this cross has a definitive property with regular rectangular cut stones create. (Figure 3.36) Other than the masonry stones, cut corner stones at buildings quoin are bigger. Some parts of building remain plastered but generally lower parts are exposed as plasters ripped off. Uncoursed squared rubble masonry style used as a masonry technique which lime mortar binding used. Wall thickness is 45 cm. Interior sides of the walls are white washed. Tension bar used for compensating stones used at masonry wall, but only one of them is visible at present state of building. (Figure 3.37) There is a divided section which built by leftover timber boards which can be considered as partition wall. It cannot be defined as a wall, but it has a thickness nearly 10-15 cm according to the thickness of timber board. It creates a semi open space for the inhabitant.

Figure 3.36. Cut Stone Corner Stones Which Create a Pattern on the Stone Masonry Wall

It will be discussed later that, the roof of this building built at a late time after collapse of the first storey but, it has the characteristics of local and traditional roofing style of its kind of industrial buildings. It is a hipped roof with 4 surfaces which put directly on the load bearing walls and flooring of first floor of the building. However, it looks like an original roof, presence of a timber eave reveals its newness. Unlike other depot

Figure 3.37. Ornamented Tension Bar Used In D03

buildings among detailly studied buildings in this thesis, this roof has a 25-cm wide eave. Right along with this fact also the use of Marseille type interlocking tiles as roof covering material is a clue of a later time addition. The original floor covering of this building is unknown because at present state, it covered with concrete screed.

About ceiling, firstly below all other elements, two approximately 30 cm wide beams are existing. It is a wooden ceiling which composed of thin joists and 20-25 cm roof boards. Those roof boards are also creating the floor covering of gabled roof above the building and a garret above the ceiling. This place could not be in use right now but, it can be the original ceiling of the ground floor of 2 storeyed industrial building in the past.

b. Architectural Elements of D03

This depot building has three types of windows. W1 is the window which located on the front façade. (Figure 3.38,A) The opening is 115 cm x 250 cm and it has timber blinding inside. Original traditional iron bars are the elements of this window type. W1 has exposed brick arched lento on both interior and exterior elevations. W1 has insect screen with timber frame between iron bars and timber blinding. W2 type windows are located on the north longitudinal façade of building. (Figure 3.38,C) Those have dimensions 106 x 250 cm opening. Both W1 and W2 have 75 cm height from the floor and both have timber sashed sun blinds. The timber window frames probably dismantled at some date in the history of building but neither W1 nor W2 type windows have window frames. At the front façade, the other window which closed later is probably in the W1 type beforehand, but it changed much, so it couldn’t

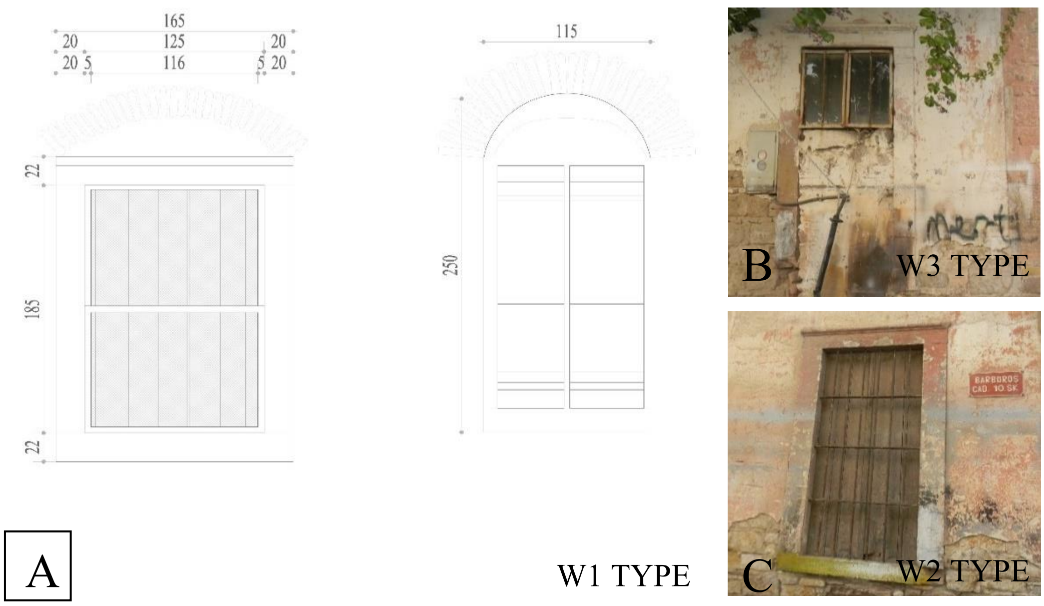


Figure 3.38. Window Types of D03; Image A: W1 Type Window with Its Dimensions, Image B: W3 Type Window Altered and Closed In a Later Period of Building D03, Image C: W2 Type Window.

be observed, and it is labelled as W3. (Figure 3.38,B) This window has opening dimensioned 145 x 133 cm. Its height is 175 cm measured from interior floor level. Another architectural element of the building is the door. D1 is located between two windows on the front façade at the centre and stone jambs are covering the opening. (Figure 3.39,A) On top of two colonnades a stone lintel is used and on top of it a transom window which hided by the signboard hung in front of it. Stone profiles used at the top of two colonnades. (Figure 3.39,B) A concrete screed ramp has structured

Figure 3.39. Entrance Door called as D1; Image A: D1 Two Sashed Iron Door of D03 and Ramp for Avoiding Excess Water Coming Through Outside, Image B: Stone Profile on the Colonnade of D1.

to getting rid of rain water coming from outside, because of the lowness of inside floor level with respect to outside floor level. (Figure 3.39,A) The third important architectural element of the building is the eave which is a rare element seen on depot buildings. On two sides of building a 25cm width timber eave is seen. Although, most of the stone masonry walls ended with brick or stone headers on top, this building has a timber finishing on top of stone masonry walls.

c. The Story of The Building D03 And Its Change

The typical symmetric façade elements and rectangular plan refer that this building is an industrial remain from the late Ottoman period which have the neo-classical features of that period as stone profiles on top of the openings and arched lintels. According to the conversation with the present inhabitant of the building, this building was a two-storeyed building beforehand. It is said that, after the collapse of the first storey the owner of the building put a roof on the ground floor and use it as a depot from that time. The remaining gap on the wall is shown as a prove by the inhabitant

Figure 3.40. The Gap Inside the Masonry Wall Which Shown as an Indicator of Previous Staircase Location by Inhabitant od D03.

as remain of the staircase of the second storey. (Figure 3.40) Also, there are some other traces on roof which prove that there was a floor above ground floor of building. Unlike other depot buildings, this building doesn't cover the whole lot which it built in. This is also a trace of a different original function of building in the past.

The function of that building right now is a traditional carpentry workshop which mostly produce local woodworks for Ayvalık. The Carpenter and his brother who work in there moved to Ayvalık approximately 12 years ago, with their families. They are managing that place together, but they are not the owners of building. Although this building changed a lot, it has original and authentic elements which still are the reminding of the past events happened there. The alterations that can be observed at

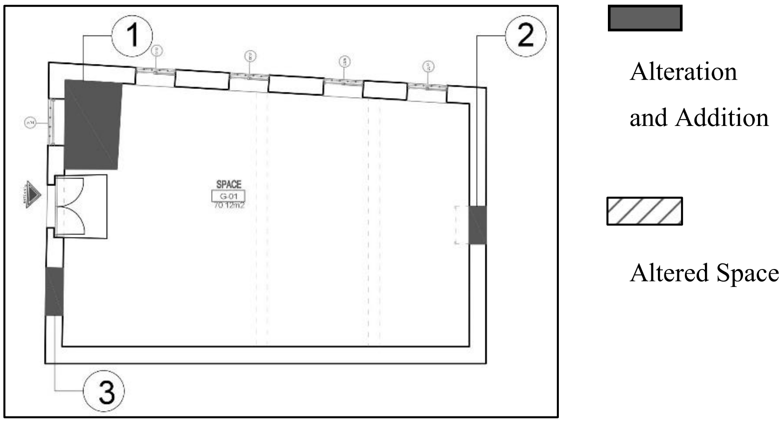


Figure 3.41. Figure Showing a Mapping of Observed Alterations on D03

present state and additions which made by the need of the inhabitant are shown below. (Figure 3.41)

1. Semi-open Spatial Addition
   A spatial addition which generated from leftover timber elements like boards and wooden profiles. It is a semi-open space for inhabitant of the building which used as a small kitchenette without fittings. Some elements like cupboards and planar elements for working on them are added to the partition area for also correspond other needs like storage. Also, upper part of this addition is used as a storage area for storing leftover elements.
2. Absent Staircase
   This alteration is elimination of the staircase. The place of the staircase is a remaining but at an unknown time after the collapse of first floor staircase was removed from the building.

3. Half-closed Window Opening

   As a third alteration, a half-closed window which was a typical W01 beforehand should be mentioned. Up to a height, to the casement part of window, it closed with mixed walling materials and plastered afterwards. The exact materials couldn’t be identified because of the plaster over it.

4. Addition of Roof

   As mentioned before, it is supposed that the roof of that building added afterwards the collapse of the first floor of building.

d. Assessments on The Building D03

The building itself does not have a structural problem. Like most of them, this depot building does not have an enough water disposal - drainage system on roofing system. Because gutter does not exist, rain water creates problem for this building. A second problem is a lack of wet space. There is no water facility in building so inhabitants use other buildings’ wet spaces to fulfil their needs. Finally, florescent lamps are the light providers which hang through joists and beams of ceiling. This lighting fixtures are not enough for that kind of a work that needs a lot of attention but, it is a removable solution for lighting which is good for building.

Considering the changes this building undergone, the present state of building shows its potential as it still stands and stay alive with a function and inhabitant in it. Building located on the crossing of two streets and it has an empty area behind the building which has a spatial potential. Apart from the devices of the present inhabitant building don’t have any permanent partition which increase the interior spatial potential of the building. There are many depot and factory buildings around it, which also adds potency to this building itself because conserving it became an important role per this fact. In addition, this fact is creating a commonness value because of traditional pattern is dense on that location. It is a common building made with traditional techniques and elements which has a traditional value. Moreover, this building conserve its remaining original elements and the alterations that building undergone are remaining’s of continuous change in the past which can be considered as change value.

3.1.4. D04 Café and Bar

This depot building is facing Barbaros Caddesi 5th street in Fevzipaşa-Vehbibey Mahallesi, Ayvalık and it is located on the whole lot which approximately 99.2 m² area. This registered building is a piece of the traditional texture around it which covered with other depot buildings and traditional residential buildings. The block number of the building is 429 and the number of the building lot is 4. (Figure 3.42,A) Its façade, unlike other depot buildings, is on the longitudinal side of the building. (Figure 3.42,C) The central door has one window on its left and two windows on its right side. Having a non-symmetric façade is also a different property of this building. Going into the building from the longitudinal side the entrance area coded as G-01 was an empty area when this building studied. At left, the wet space and a divided

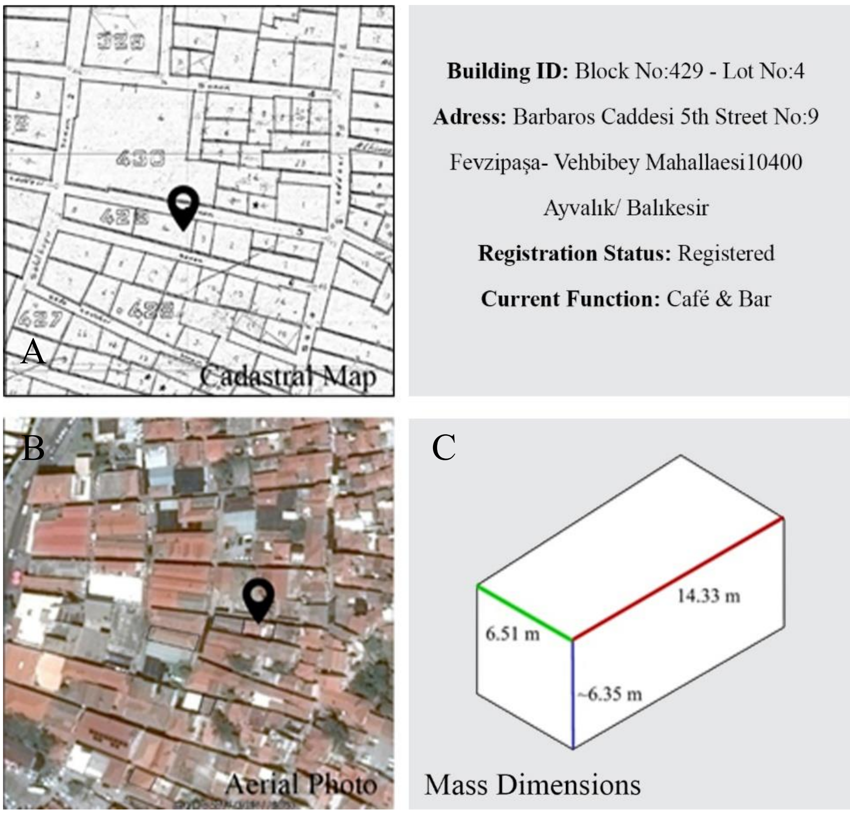


Figure 3.42. D04 Café and Bar, Image A; Location of D04 on Cadastral Map, Image B; Location of D04 on Aerial Photo (Google Earth last accessed on 25.09.2017), Image C; Mass Dimensions of D04

space which will be used as bar afterwards are located. The floor level decreases at the G-02 and G-03 spaces approximately 7cm. Building doesn’t have a stable staircase from ground floor to mezzanine floor. There is a metal movable stair that allow people to climb up. The concrete slab which carried by a concrete column and the brick masonry division wall is created the mezzanine floor. The space 1-01 is now a transition area but after the makeover of building, the function can be changed. Divided with timber partition components, 1-02 is a semi-open space which probably used as office in the buildings past function but, at present state this space is non-functional. (Figure 3.43)

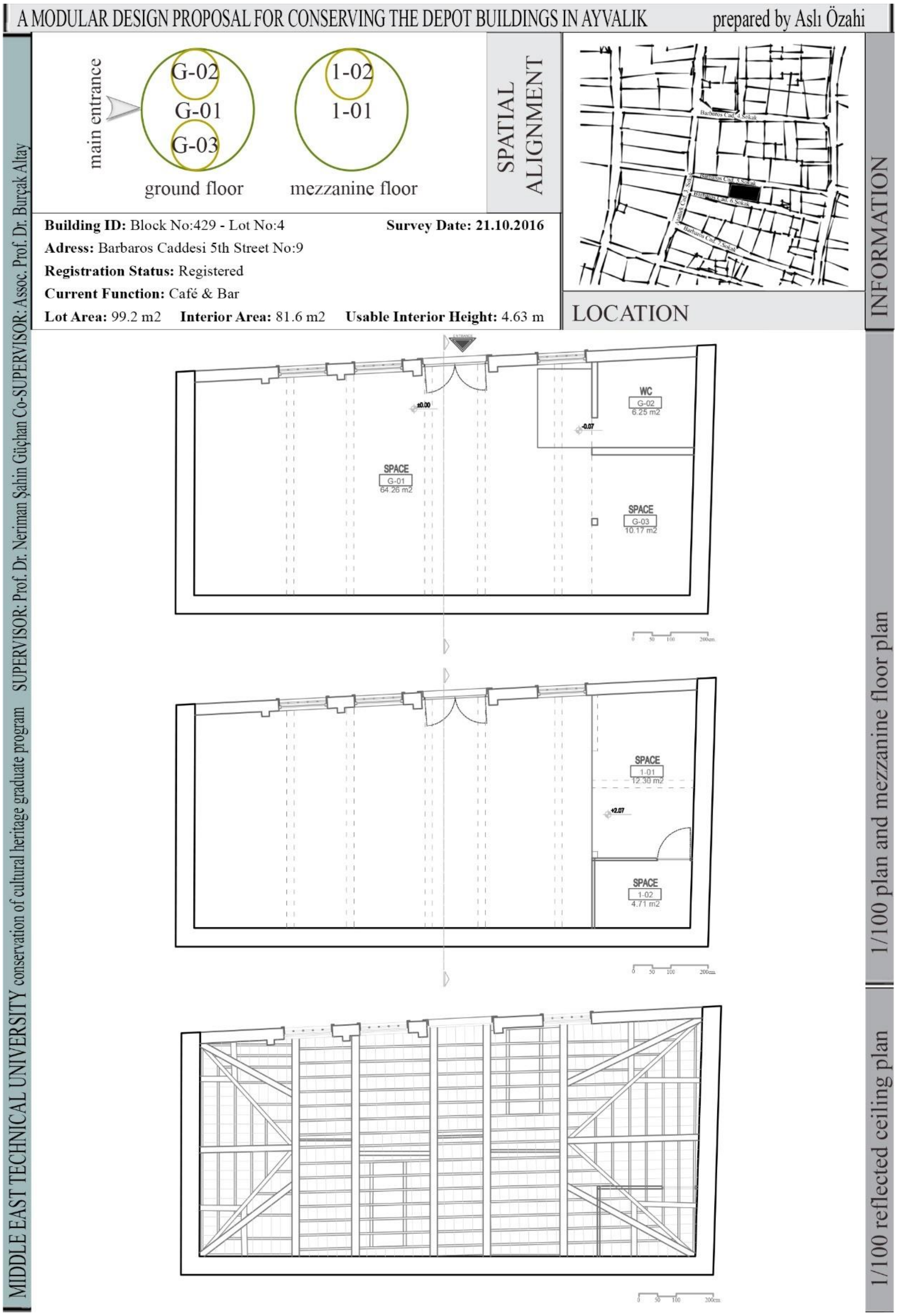


Figure 3.43. Survey Drawings of D04

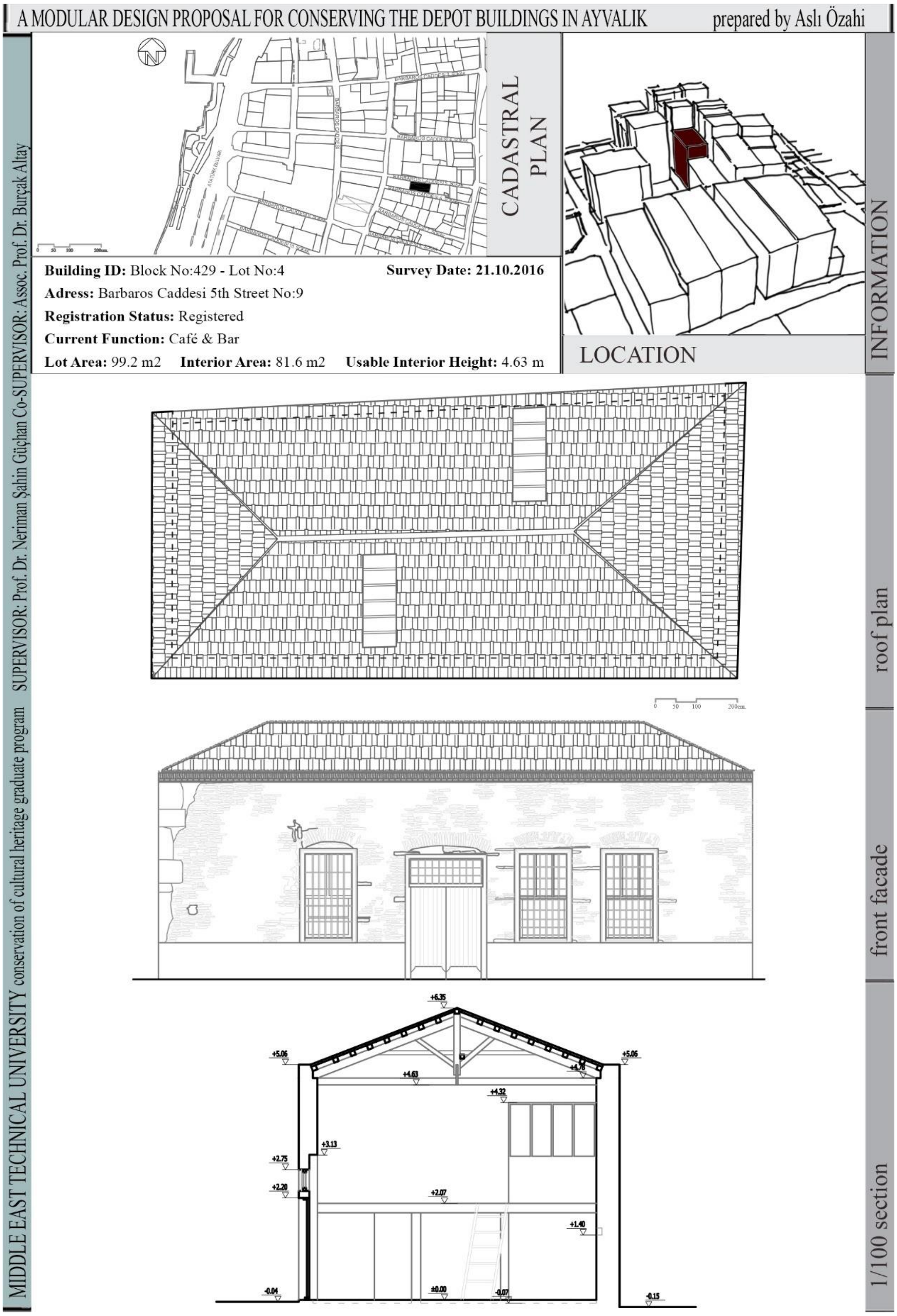


Figure 3.44. Survey Drawings of D04

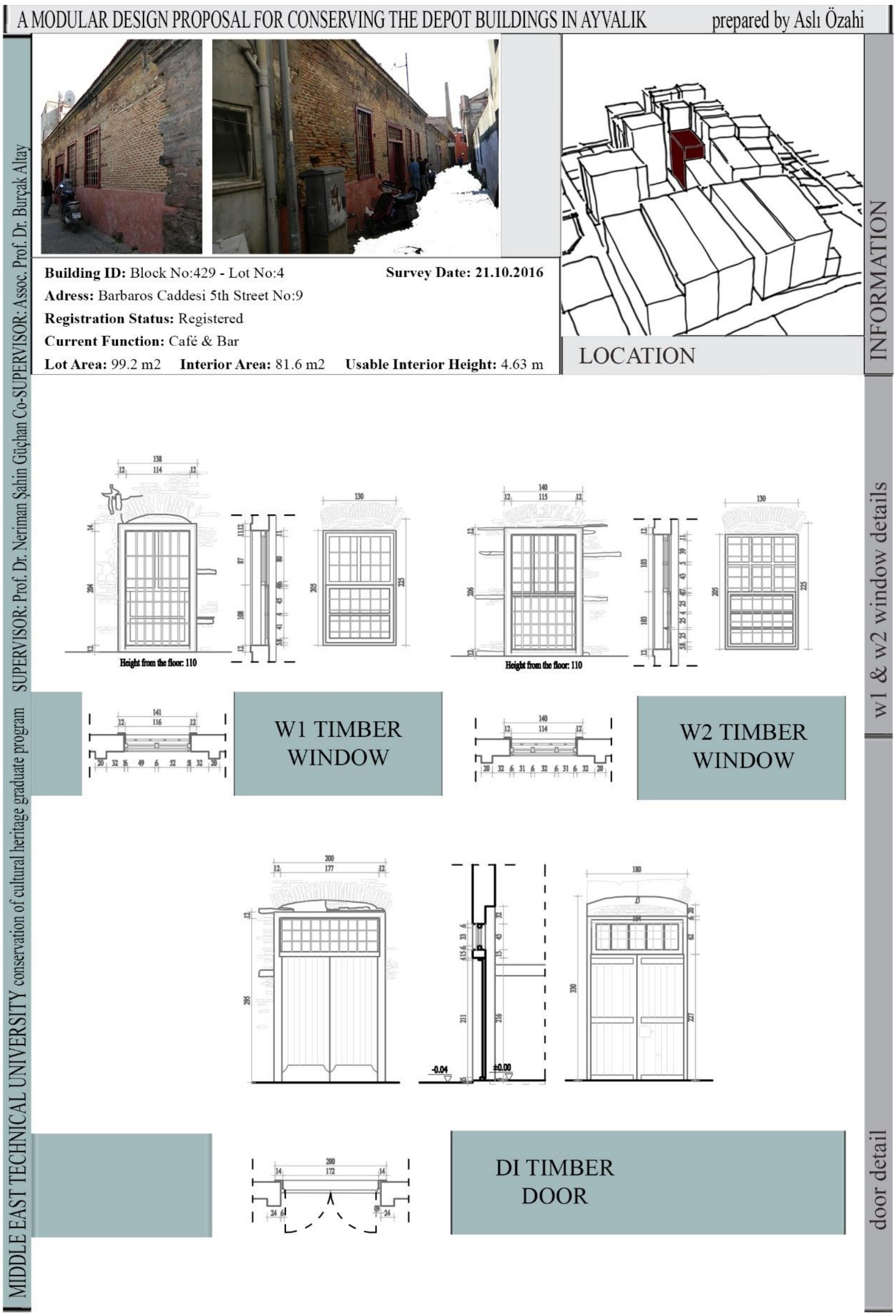


Figure 3.45. Survey Drawings of D04

a. Structural Characteristics of D04

Three stone masonry walls and one traditional brick masonry wall are the load bearing walls of building. (Figure 3.46) Two types of stone masonry style used in construction of building. Load Bearing Wall 2 and Load Bearing Wall 3 are different in style as this can be the evidence that two load bearing walls may be collapsed at some time in the past.

Load Bearing Wall 1 is a coursed traditional brick masonry wall which is the front façade of building. (Figure 3.48,A) It stays along the street and it contains all openings of the building. The thickness changes among 30-43 cm. There are some columns on two side of openings which have 20 cm wideness. At the quoins of building big

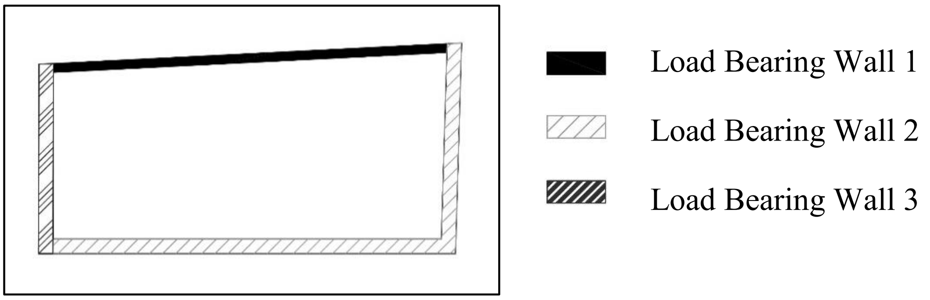


Figure 3.46. Figure Showing Different Masonry Load Bearing Wall Types Used in Forming the Building D04

squared cut stones which, probably remain from the old façade, are supporting the wall. Like stone masonry facades of other depot buildings, tension bars exist at the upper part of LBW1. The lower parts of this wall are plastered so the material couldn't have been observed. (Figure 3.48,A) At the upper part of LBW1 where it joins with the roof, a multi-layered brick heading is located above the brick wall. Load Bearing Wall 2 is to be the original walls of this building from the first emergence of it. (Figure 3.48,B) It is in the uncoursed squared stone masonry style with 40 cm thickness. The longest side have some blocks of emptiness in the height of 140 cm in approximate size of 10x15x12 cm. (Figure 3.49,A-B) At some parts of masonry traditional brick

Figure 3.47. Two Different Partition Walls Used in the Building D04.

also used mixed with squared stones. Bigger stones used at the lower parts of building and shorter but wider stones can be seen on the upper parts of the walling.

Load Bearing Wall 3 is differing in style from Load Bearing Wall 2. This also be counted as an evidence of LBW1 and LBW3 were collapsed at a time in the past and rebuilt. LBW3 is uncoursed rubble masonry as walling technique and 40 cm thick. (Figure 3.48,B) Two kinds of partition walls were used in the building. Firstly, a thin brick masonry wall divides the lower part of mezzanine slab. (Figure 3.47) Thickness

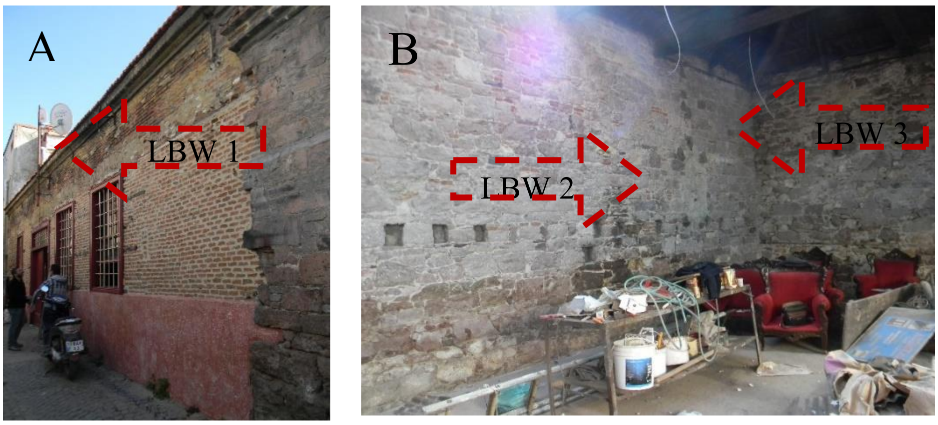


Figure 3.48. Masonry Walls of D04; Image A: Load Bearing Wall 1 the Front Façade of Building D04, Image B: Interior Elevations of LBW2 and LBW3.

Figure 3.49. Blocks of Emptiness at 140 cm High on Load Bearing Wall 2.

of this wall is 15. It is creating the wet space of building. Secondly, on mezzanine floor, a timber panelled system used as a semi-open partition with its long transparent glass windows on it. (Figure 3.47) The thickness of that partition is not much more than 10 cm. A trussed roof system with 5 trusses used for creating a hipped roof with four surfaces. Five beams were applied for passing the opening which have 20 cm thicknesses. The set of roof elements are beams, posts, collar beams, purlins, rafters, a ridge purlin and over all of them roof boards. As roof coverage, interlocking Marseille type roof tiles are used. At present state two skylights are existing as architectural lighting elements. The original floor covering of this depot building changed in an unknown period of building in the past so now, the existing floor covering is concrete screed and in toilet ceramics were used.

b. Architectural Elements of D04

Building has its all openings on the brick masonry front façade. They have arched lentos with brick as material. The window opening called W1 and W2 have the dimensions 130 x 227 cm. W1 is one of the three windows of the whole depot building. (Figure 3.50,A) This timber double sash hung window has the same proportions with other two windows which called as W2 but, their appearances are different. They have the same timber frames which have thickness of 15 cm. Their height from the interior floor level is 110 cm. Different from other depot buildings,

W1 type W2 type

Figure 3.50. Windows located on D04; Image A: W1 type Hung Sash Timber Window, Image B: W2 type Hung Sash Timber Window.

window openings of this building don't have cut stone jambs covering timber framed windows at the exterior elevation of building. (Figure 3.50) In relation to this fact, they have some timber supports around them inside the brick masonry, which is not common in stone masonry openings. The door D1 is also having the same properties which comes with brick masonry construction technique and properties concurrent with window frames which introduce that they produced and implemented at the same time. It is 180 x 330 cm and it has a transom window over it. Over the door opening, the lento has a very wide oval alike arch.

c. The Story of The Building D04 And Its Change

Unlike typical rectangular depot buildings which have entrances on their short side, this depot building has an entrance from the longer side of it. It is probably because all other three sides of it are covered with adjacent buildings. Moreover, the whole façade of building has changed in an unknown date which is obvious. There are very few evidences about the original façade of building. It was probably a stone masonry wall which is one of the definitive characteristic of depot buildings, but the original location of door and windows are unknown. The new façade also built in an

Figure 3.51. Image A: Multi-layered Brick Masonry Heading Over LBW 1, Image B: Front Façade of Building D04.

accompanier manner to other buildings near it and other depot buildings. (Figure 3.51,B) It has similar arched lentos over door and window openings and timber hung sash windows and timber door. With respect to the neo-classical style, brick transition elements from wall to roof on the front façade rowed and offset approximately 5-8 cm over masonry brick wall. (Figure 3.51,A) Those are rowed traditional bricks on their shorter side which act as a transition element seen in most of depot buildings in different styles. There is again a later addition of a gutter to restrain from accumulation of water and canalizing excess water. (Figure 3.51,A) According to the studies done by Esra Terzi in 2007, this building was abandoned on that year. (Figure 3.52) It was

Figure 3.52. Photograph of D04 taken in 2007 (Terzi, 2007)

categorised as a warehouse by the author and the construction date of the building could not have reached. When the field trip has done in 21st October 2016 building started to prepare by present inhabitant for opening a new café and bar into it. It was one of the empty depot buildings beforehand but, with some small repairs building become an alive working structure. The function before the empty period of depot is unknown but a concrete slab as mezzanine and partition walls assembled. This is not a reversible addition to building. Below; alterations and changes that building undergone have listed.

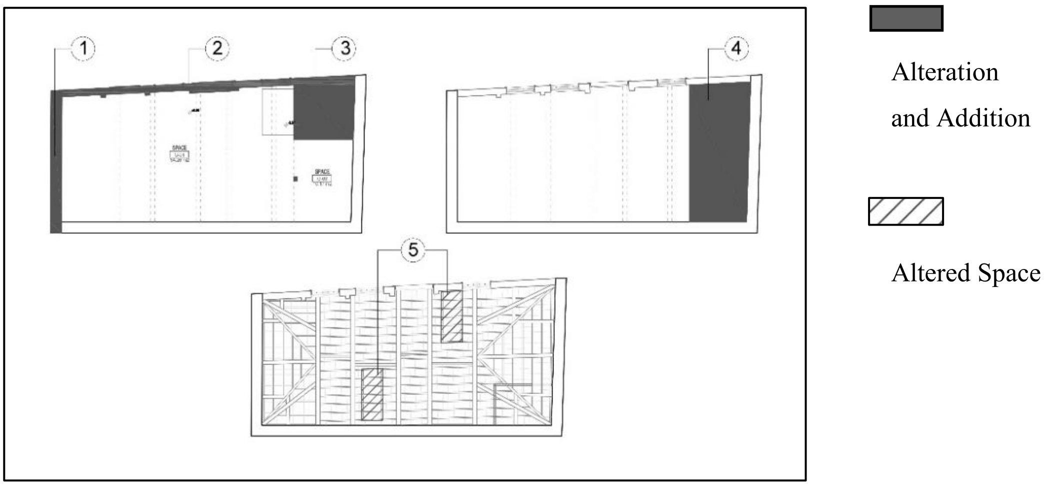


Figure 3.53. Figure Showing a Mapping of Observed Alterations on D04

1. Altered Stone Masonry Wall
   This wall LB3 has a different masonry style which gives the clue of the reorganisation of the wall. It is in uncoursed rubble masonry style and dissimilar to the LB2 which also made with stone masonry technique.
2. Altered Façade
   Façade alteration is important for this building because it is a remain from a previously done change which, made in respect to other related depot buildings with different technique and material. A unique example of traditional brick masonry seen on this altered façade.
3. Wet Space Addition
   The need of a wet space is an important aspect for any working building which inhabitants live in it. In this building, lower part of the mezzanine floor was chosen for this space. Currently it is not in a suitable state to use it because it doesn't have any door or plumbing fixtures, but building is in a reparation state when the study over building was continuing.
4. Concrete Slab Addition
   An inflexible addition to the building which can give harm in the case of the decision of removal. It adds 16 m² additional living space to the building which

is a positive effect of it but the technique while doing this could be more reversible and flexible.

5. Opening a Skylight to Roof

   This alteration also took an irreversible step on the history of building which means material loose. The original timber material has lost by removing of some roof boards or cutting them in a way it provides a space between rafters. Interior became more luminous with this alteration which creates an ambient inside, on the other hand it can create leakage problems by the mismatch of two materials raw timber and glass.

6. Alterations on Roof Boards

   In some parts of the roof differentiated roof boards can be seen. Those are intervened parts of the roof during past repairs. Original wood has lost but, those repairs are one of the reasons this building continues its life.

d. Assessments on The Building D04

Primarily, making a mention of the problems of this building is important for making assessments on it. Building doesn’t have many structural problems except some minimal approximately 2 mm cracks on the brick masonry façade. In addition to it, on the upper part of this wall a colour change and loss of mortar can be observed which spread among the longitudinal façade horizontally (Figure 3.51,B). This problem is structurally an important problem and it should be solved for the future of the building. It probably occurs because of the water accumulation problem on the roof. Another reason can be that; this wall is the thinnest wall of the building which also have the all openings on it. The load of the roof carried by 4 load bearing walls is divided equally to all of them. This can be the reason front façade seem more damaged than others. Other than this, insulation is the second problem of this building which originally did not a work item of the construction purpose of building. Although, some precautions had taken while filling window frames with foam insulators, it is not enough for the whole building isolation from outdoor climate conditions.

Apart from the problems, this building holds many potentials. It embodied a very big area inside and among studied buildings, one of the highest elevations, is possessed by this building with 6.35 m. However, building have some small structural problems, it is a very special, luminous, and authentic empty space which potentially very strong. It creates a potential for more than one function. In addition to this, having an entrance at the centre of longitudinal side creates potential for using the left and right areas of building separately if needed.

This depot building is one of a unique example of depot buildings with its changed front façade in a companion manner with the other buildings. This is an undeniable value for this building which shows how change can provide value and how it is a part of the lifetime process of a building. According to the studies done in the past, having front façade on the longitudinal side is a rare property which makes this building uncommon among others. Yet, it has its traditional value because of its traditional technique and construction practice.

3.1.5. D05 Antique Shop and Woodwork Restoration Atelier

The building is located on a whole lot approximately 137 m². The open address of the building is Barbaros Caddesi 7th Street No:18 Fevzipaşa-Vehbibey Mahallesi, Ayvalık. The second door of building which facing Barbaros Caddesi has the door

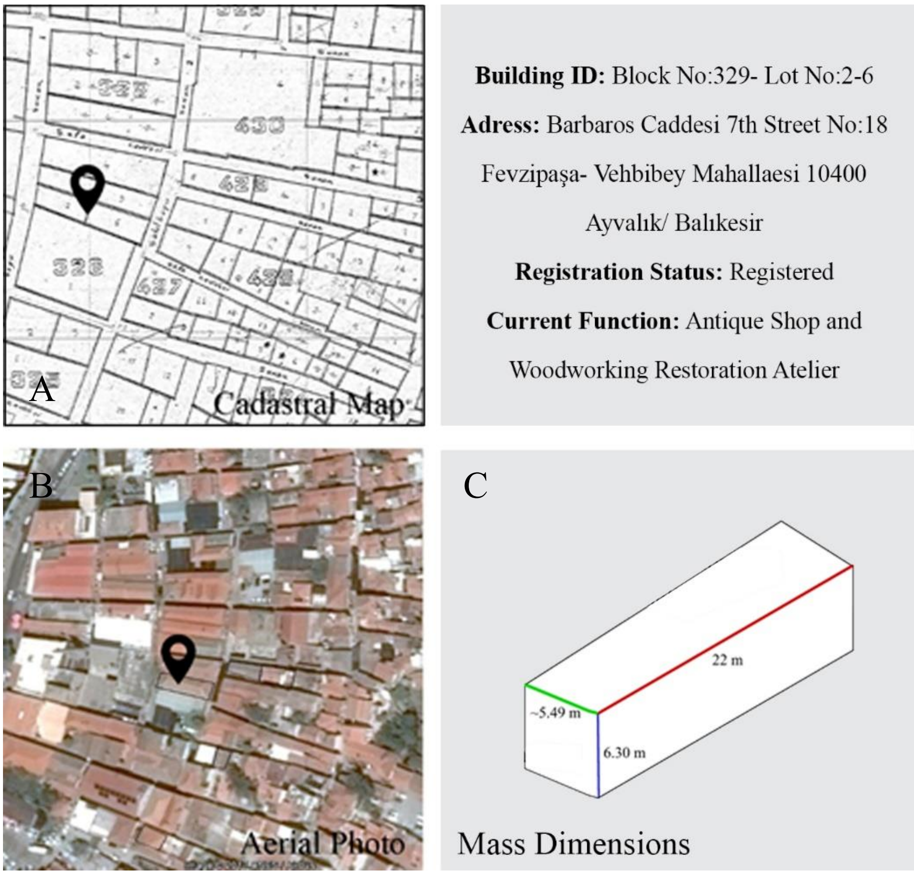


Figure 3.54. D05 Antique Shop and Woodwork Restoration Atelier, Image A; Location of D05 on Cadastral Map, Image B; Location of D05 on Aerial Photo (Google Earth last accessed on 25.09.2017), Image C; Mass Dimensions of D05

number 29. This studied building is actually a divided part of a bigger building which next to it. At present state, those buildings have a single roof which covers all of them but, in the cadastral map, building lots were separated into four. (Figure 3.54,A) Block number which buildings stand on is 326.

The studied depot building is belonging to the same person which stand on the lots 2 and 6 and it has a partition wall which provide building used by two different users and functions. On those four separated lots the buildings constructed at the same time and with same technique but unfortunately the adjacent building could not have studied during field study. The studied depot building is a registered depot building. It has two entrances on both shorter sides, one of them conserved with its original façade allocation although the other one changed. The unchanged façade has a door and a window on it (Figure 3.57) and the changed façade which faced Atatürk Bulvarı 1st street has a barred door with translucent glass windows in it. From the entrance of the original façade, G-01 is welcoming space which functioned as antique shop with different kinds of old eccentric objects. G-02 is in this space as a wet space which separated from the G-01 with timber partitions. On that wall, which it implemented, plumbing fixtures can be seen and next to this timber partition a small kitchenette created with a timber counter for inhabitants of the building. This space also used as cash point of the shop. In G-01 a timber staircase has seen with its timber handrail. It allows going up to the mezzanine floor which inhabitants use that place as a storage for their extra belongings. The roof beams are creating obstacles on the mezzanine floor which separate the space into four. To go on through mezzanine floor, passing under the beams is necessary for the user which restrain the functionality of this floor.

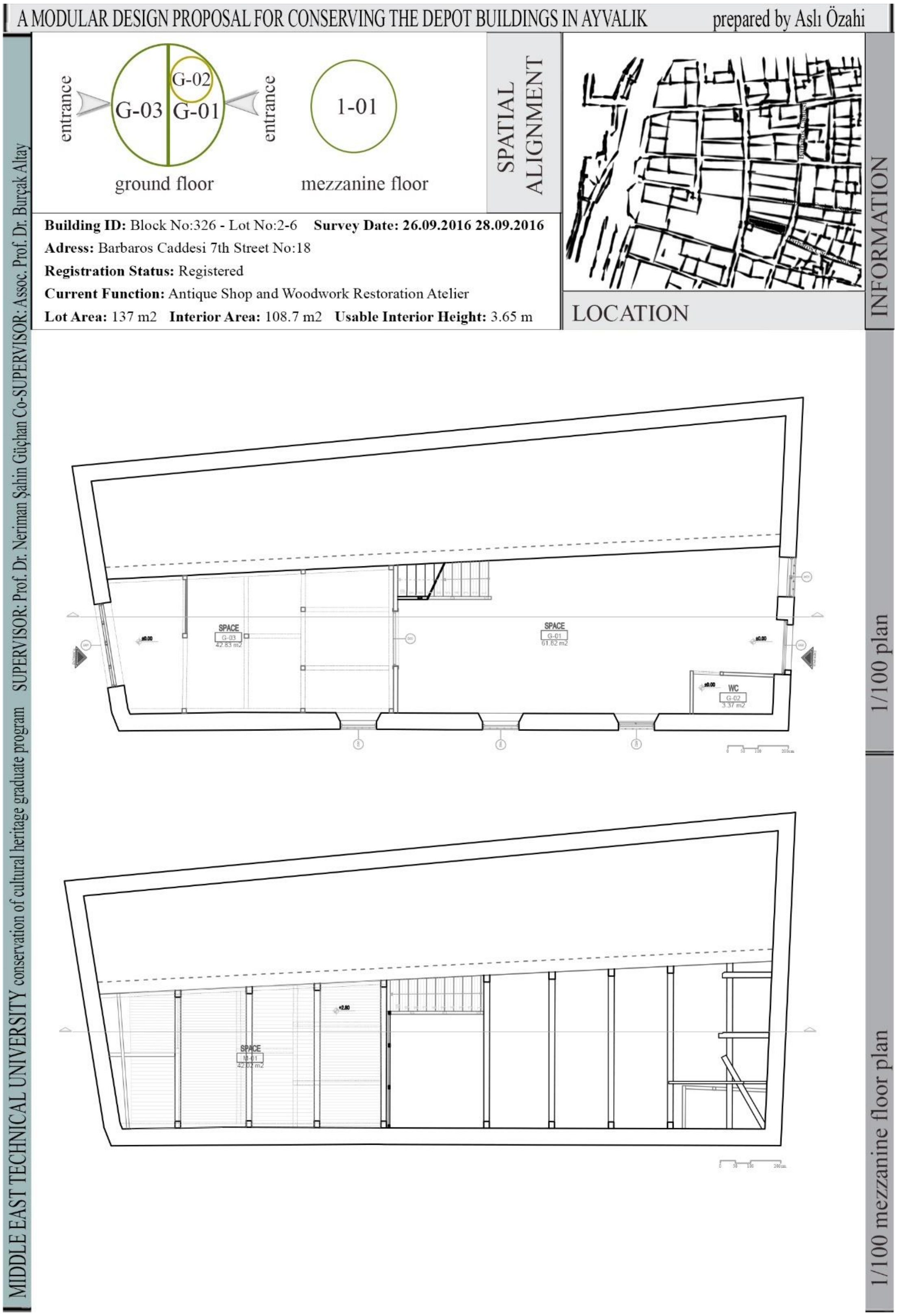


Figure 3.55. Surveyed Drawings of D05

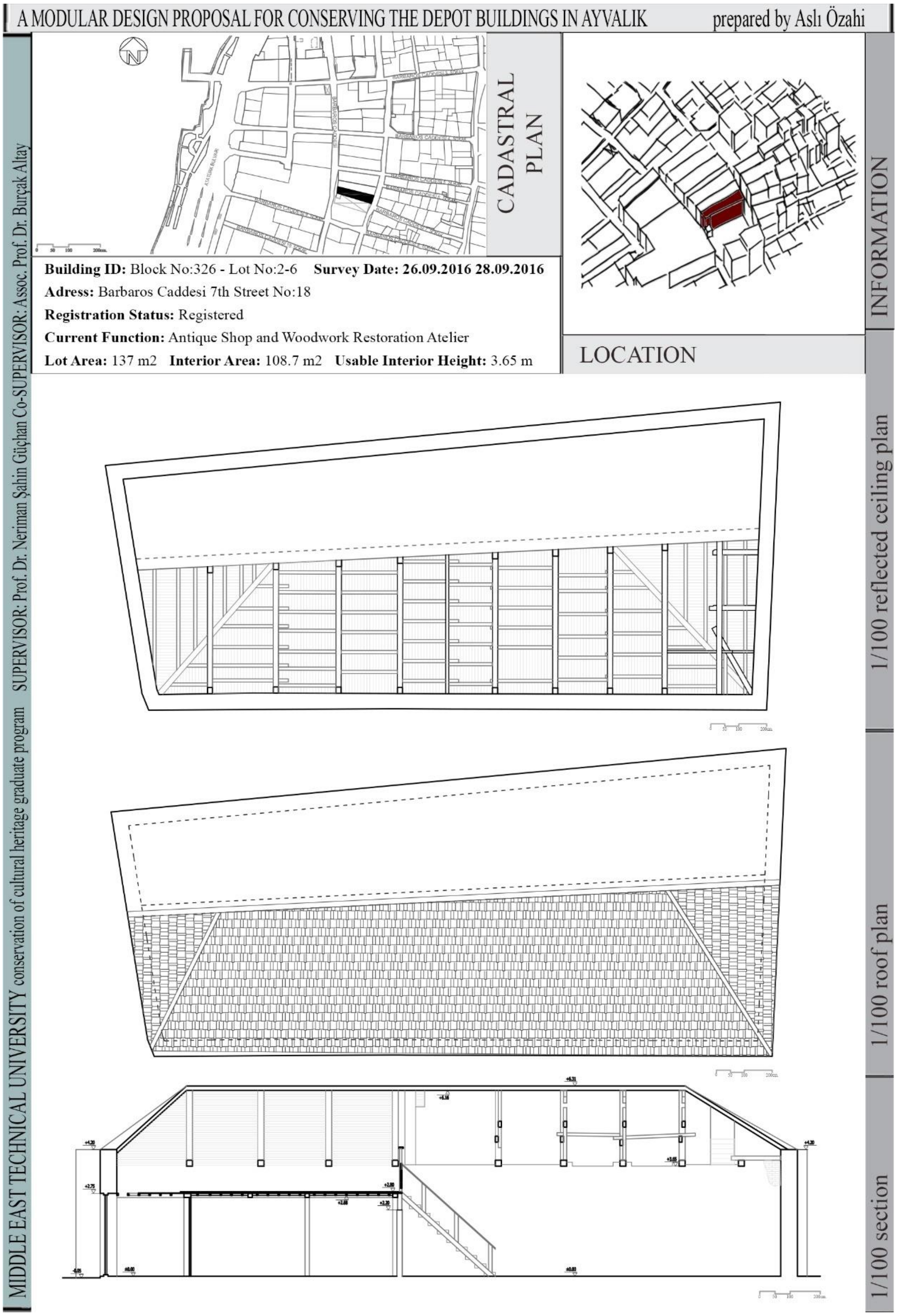


Figure 3.56. Surveyed Drawings of D05

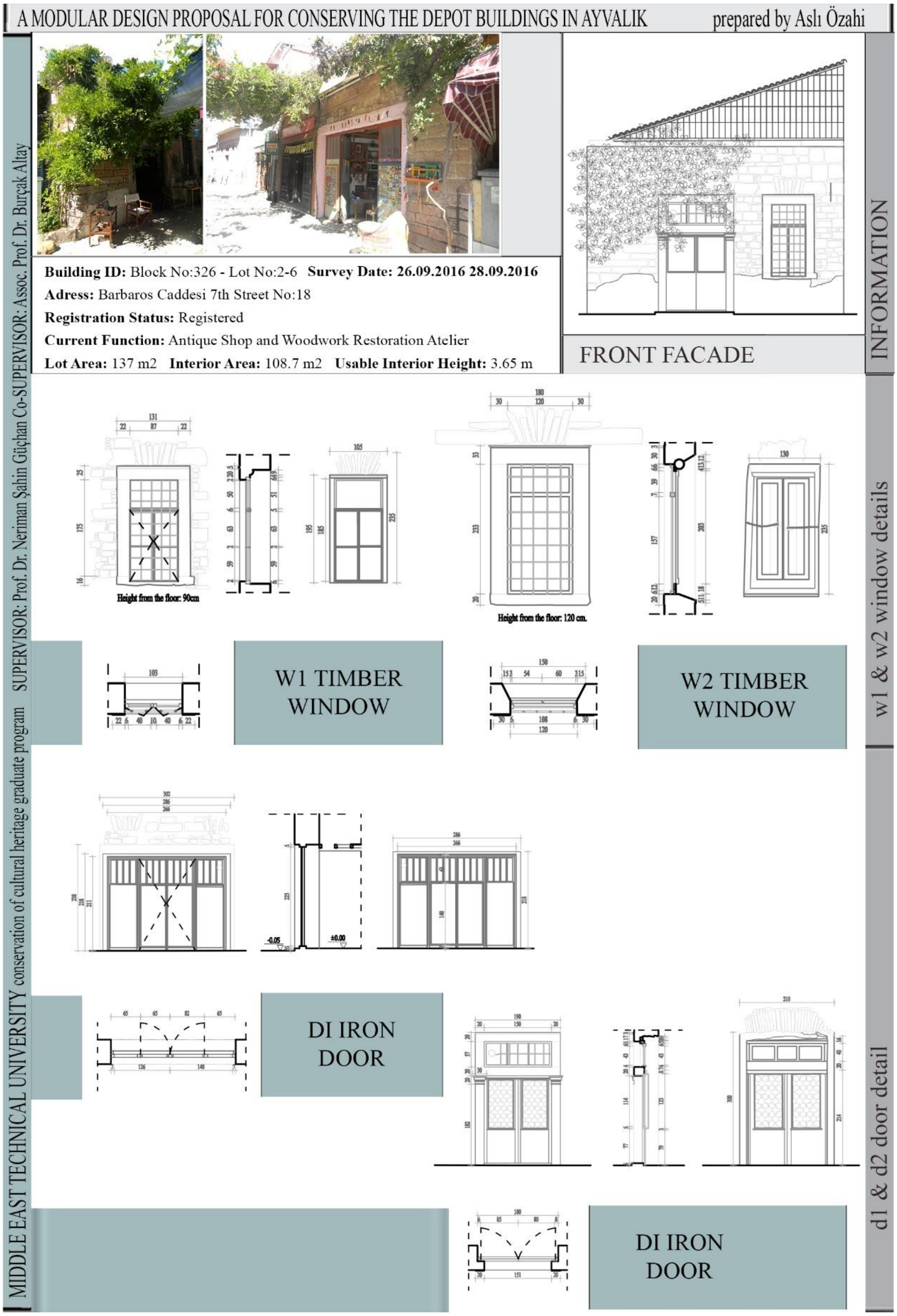


Figure 3.57. Surveyed Drawings of D05

a. Structural Characteristics of D05

This depot building is made from squared stones in an uncoursed stone masonry technique. It was built with the adjacent depot as a same building but with a stone masonry wall in-between them it was divided whole building into two buildings. The thickness of this division wall could not measured during field study but, the load bearing walls have 55 cm thickness. On the upper part of the division wall, timber lathing technique (Baghdadi technique) seen which roof beams stuck in. (Figure 3.58,1-2) Some parts of the wall which made with this technique are plastered and some parts hidden behind thin timber panels. Most of the exposed timber laths located

Figure 3.58. Figures Showing Roofing Elements; Image A & B: The Timber Lathing Technique Used at the Upper Part of Stone Masonry Wall, Image C: Explanatory Photograph of Timber Trussed Roofing Structure

mezzanine floor M-01 and between timber panels laths can be seen at the space G-01. All stone masonry walls painted from inside with white paint.

Apart from load bearing walls, a partition wall used for the separation of wet space from the whole big G-01 space. This timber partition wall has 10 cm thickness and the height of it is 2.10 m. This space is like a timber cabinet for restroom. An OSB alike timber material used both as partition and also door material. On the other hand, a wall divides the whole rectangular long space of the whole building into two spaces as G-01 and G-03. This partition wall has 14 cm thickness and rises to 280 cm. It is a plastered and whitewashed wall, which mostly obstruct the view of the structural material of it, but from the edges of the wall some timber elements can be identified from G-01 space which refers to a timber skeleton structural system for this partition

Figure 3.59. Image A: Photograph of Timber Mezzanine Floor Structure, Image B: Space G-03 and Ceiling of it Which is Timber Mezzanine Floor Structure, Image C: Projected Stone Element Which is an Indicator of Previous Mezzanine Floor.

wall. The elevation seen from G-03 space belongs to this partition wall, is covered with OSB panels and timber shelfs fixed on it as this space used as atelier.

Another important structural element of this building is the roof which gives a different ambient and deepness to building. (Figure 3.58,A) The whole building has hipped roof with 4 sides. The surveyed part of the building has the half of the whole roof. The ridge of the roof could not have seen because of the wall between two sides but, posts of the triangular trussed timber roof are on the surveyed side of the building. There are 9 trusses with 23-25 cm thickness spanning the whole area. Roof of the building is structurally in a very good condition and no change in roof elements observed. Traditional over & under roof tiles were used which are also original elements of roofing structure.

At the upper part of G-03 a timber skeleton mezzanine floor settled in an unknown date in the history of building. This mezzanine floor called M-01 has its timber columns at the space G-03. (Figure 3.59,B) There are nine columns which carry the timber flooring of mezzanine floor at this space. Those timber columns have square sections and side lengths of them are 14 cm. (Figure 3.59,A) The height of the ceiling of G-03 from the zero level is 2.63 m. The floor level is 2.80 m through zero level. So, the thickness of the timber floor slab of mezzanine floor is approximately 12 cm. The timber ceiling of G-03 is created by structural elements of the floor slab which carry the load through columns. (Figure 3.59,B) On the upper side of the section of mezzanine floor, timber flooring boards and after them joists among the whole area can be observed. After those structural elements, grand beams divide the mezzanine floor load through timber columns. (Figure 3.58,A) Although the mezzanine floor is a new addition, projected stone elements from stone masonry wall have the traces of the past original allocation of original mezzanine floor. (Figure 3.59,C) At ground floor, the existing floor covering is concrete screed and at mezzanine floor timber floor covering boards used as material.

b. Architectural Elements of D05

This depot building has many kinds of openings to establish an inside-outside connection. First, it has its original façade elements on the front façade which faced Barbaros Caddesi 7th street. On this original façade allocation, D2 is the existing door type which have an arched lento, carrying neo-classical properties like stone colonnades and stone headings over them. (Figure 3.60,A) The opening has a 210-cm width and 300 cm height. Yet, the other façade of the building had fully changed. Except some traces of windows on stone masonry, original door opening replaced with an enlarged opening and a cast iron two-winged garage door, D1. (Figure 3.60,B) D1

Figure 3.60. Image 1: Iron Door in D2 Type, Image 2: D1 Type Altered Door Which Disrupt the Original Façade Allocation, Image 3: D3 Type Timber Interior Door.

has approximately 286 cm width and 218 cm height. Apart from these D3 is a two-winged timber interior door located at the centre of the partition wall with the 220-cm height and 180-cm width. (Figure 3.60,C) Secondly, there are two types of windows in this building. All of them have iron bars located outside of the building. W1 is the one on the front façade. (Figure 3.61,A) It is a timber window framed two sashed windows, with a transom window over it. The frame painted with blue colour which is different from the other types. Opening dimensions of W1 are 105 x 195 cm. The height from interior floor level is 90 cm. W2 windows are located on the longitudinal

Figure 3.61. Image A: W1 Type Window of D05 Exterior Elevation, Image B, W2 Type Window of D05 Exterior Elevation, Image C: Interior Elevation of W2 Type Window with Sashed Timber Sun Blind, Image D: Interior Elevation of W2 Type Window Without Timber Sun Blind.

façade. In W2 type one window has timber sun blind. (Figure 3.61,C) There are three windows in the building with this type. (Figure 3.61,B-C-D) Those timber framed windows are one sashed window with a non-operable transom window over it. Openings have dimensions as 130 x 235 cm. and from interior floor level their height is 120 cm. As this building is an example with mezzanine floor, among depot buildings detailly surveyed for this thesis, staircase is an important architectural element. (Figure 3.62) This timber staircase has a width range change around 100 cm to 115 cm because

Figure 3.62. Timber Staircase of the Building D05; Image A: General View of Timber Staircase, Image B: Figure Showing Scratchy Timber Balustrade of Timber Staircase, Image C: Timber Supports Under Every Tread Which Fixed on Stringers on Both Sides of Staircase.

of the irregularity of wall which is not parallel to the opposite wall. This trapezoidal shaped staircase has 10 steps and those steps have 28 cm risers and 30 cm width treads. It has stringers on both wall side and the opposite side. (Figure 3.62,B-C) Under every tread, a support connected with both tread and stringer is existing. As it is a staircase which made with unqualified materials in a scratchy way, it does not have ordinary "balustrades but, three vertical elements are creating the handrail. (Figure 3.62,B)

c. The Story of The Building D05 And Its Change

This depot building is a huge building in size considering the majority of depot buildings. When examined the cadastral plan it can be seen that, this building stand on the lots 2 and 6 which also integrated with the adjacent building, standing on the lots numbered 3 and 5. (Figure 3.54,A) At the existing situation, (Figure 3.64) the

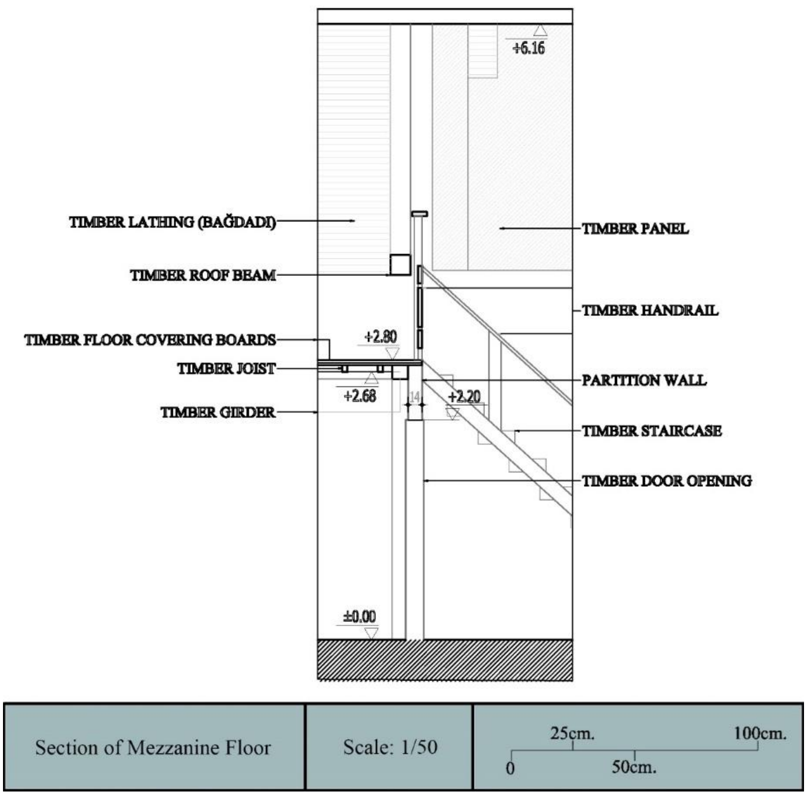


Figure 3.63. Section Showing the Junction Detail of Mezzanine and Timber Staircase of D05.

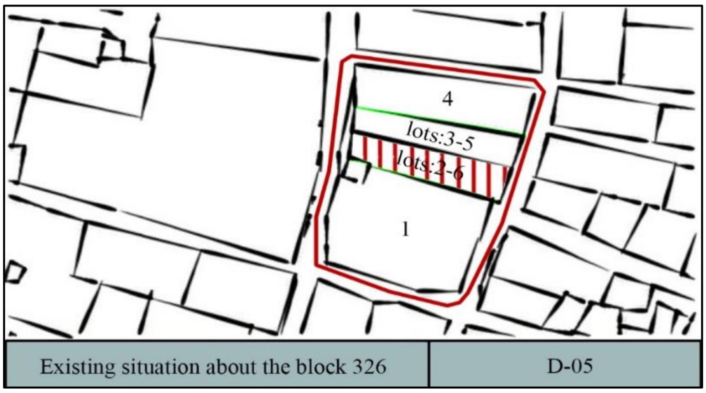


Figure 3.64. Figure Showing the Present Situation of Block 326 According to the Field Study Done by Author in 11th October 2016

building located on lots, 3 and 5 is a unified building with analysed depot building, which deduced by looking the structure of their roof and the wall separated each one into one building. The construction technique of both buildings also supports this idea. In addition to this, depot building D-05 is having the neo-classical properties of the 18th century with its arched lentos, colonnades on both sides of the entrance door and typical rectangular depot shape. According to the study made in the year 2005 by the students of Graduate Program of Restoration for the course REST 507, the obtained date from *"Emlak Vergi Beyannamesi"* shows the construction date of this building is between 1900-1922. Again, the building used as a depot building regarding to this studies map of "*Current Use of the Buildings"* in 2005. (APPENDIX or FIGURE NUMBER) In 2007 this building studied by Esra Terzi, and at that year it was functioned as a shop. (Figure 3.65,A) It categorised as a workshop building but construction date was unknown as the information gained from that study. (Terzi, 2007, p. 188) It is now used by two different functions and two different inhabitants as antique shop and woodwork restoration atelier. Both inhabitants are tenants of the

Figure 3.65. Images Showing the State of Building in 2007 and 2016; Image A: Photograph taken in 2007 (Terzi, 2007, p. 188), Image B: Photograph taken in 2016 by the author.

building. As everything changes by the time passes this building is also having some parts undergone into change. Below, the changes coming through the history of the building are listed.

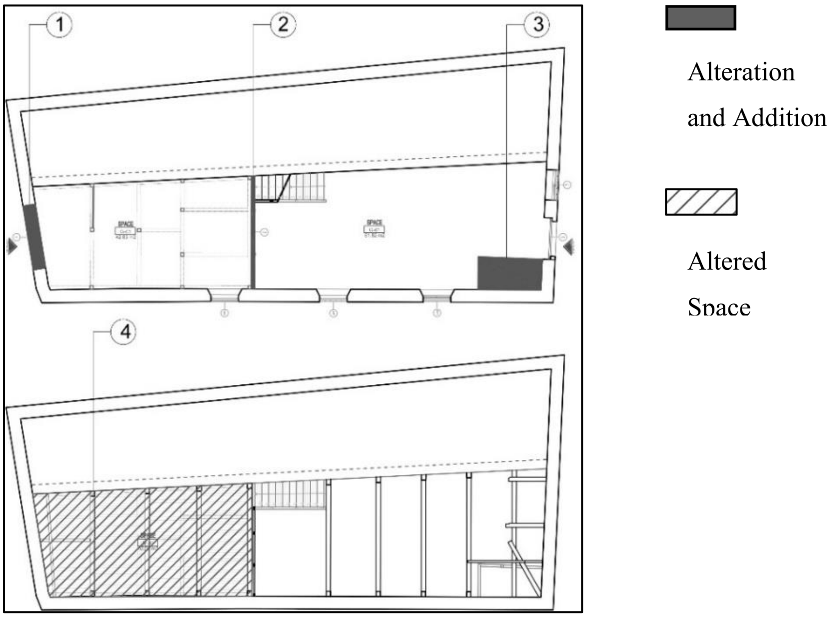


Figure 3.66. Figure Showing a Mapping of Observed Alterations on D05

1. The Change of the Entrance Door and Façade

   This change is important as it effects the street view of the building and street view itself. The original façade elements are lost and the replaced door is an unqualified big iron door with bars which is not adequate to the whole ambiance of building. Remaining brick elements of arched lento, of past door opening are existing which can be seen from the interior.
2. Partition Wall Addition/Change

   The partition wall divides the building into two with a two-sashed timber door which is not locked but, enable the transition among spaces. As the building stand on two adjacent but different lots, it is interrogable that, this division wall is a new addition or not, but, as if it is an original partition wall the addition of door had done which is also a part of the change.
3. Wet Space Addition to Building

   The need of a wet space is important for this kind of commercially used buildings. With this timber cabinet-alike addition, a solution made by the inhabitants the restroom function was added to building.
4. Change in Mezzanine Floor

   The existing mezzanine floor is a changed version of the earlier mezzanine structure. There are some stone projections on the stone masonry wall which are the traces of the past mezzanine floor allocation (Figure 3.59,C) but, the timber elements composing mezzanine floor are new elements. (Figure 3.59,A) Besides, the floor part close to D-01 has missing floor elements which create a gap on the floor at mezzanine. The load-bearing frame system at ground floor and all its components are also new materials which creates mezzanine floor (Figure 3.59,B).

d. Assessments on The Building D05

The first assessment category is the problems which affect the building, its function and inhabitants. This depot building from the late Ottoman period is a structurally healthy building with no structural problems. However, in most of other depot buildings have dampness problems on their walls because of the leakage penetration through the roof, this building doesn't have any problem about this occasion. It has climate insulation problems like all other depot buildings, because the aim for constructing those buildings is not for living but storing goods in them. Again because of the same reason, wet space is a missing function, which later added to correspond the needs of users. This addition is done by some unqualified materials and in a scratchy way which doesn't have any suitable space and enough ventilation. One of

Figure 3.67. Provided Light Sources in D05; Image 1: Insufficient Lighting For Woodwork Restoration Atelier Function in G-03, Image 2: Chandeliers Which Hung Through Roofing Beams at G-01

the most important problematic point of this building is wet space which used by more than one inhabitant at the same building. On the other hand, lighting is also a problematic side of the building. For the atelier part, as the ceiling level decreased because of the mezzanine floor, and as a timber partition added to divide welcoming area and atelier, gathered daylight proportion is decreased. (Figure 3.67,A) There is no chance to get daylight except the light coming from big entrance door. Florescent lamps hanged among the ceiling are not enough for that kind of profession which needs attention. On the other part, a chandelier is used at the antique shop which is adequate for the shop but not adequate for the shopping experience because of the low light. (Figure 3.67,B)

The most important potential of the building is the massive size of the building. Without mezzanine floor the ground floor area of this building is about 110 m^2 and it contain much space for more than one or two functions. At the same time, it does not have a crucial and important structural deformation or problem so that, the functions given them can accomplished without much effort given to building structure. The height of the usable area reaches up to the lowest point of roofing girders is 3.65 m which allows a suitable height for any function. Although one side of the building is adjacent to other one, the other longitudinal side is facing an empty lot which now used as parking lot but create a great potential for this depot building with its emptiness.

Among all these problems and potentials, it is a typical example of depot buildings spread through commercial area of Ayvalık urban settlement. Right along with its traditional value, this building is a piece of the dense industrial pattern in the street which it is located. It is important as it is the only example, among detailly studied depot buildings for this thesis, with its original stone projections of mezzanine floor. It gives some clues about the past allocation of the original mezzanine floor height which will be served as a data for the intervention proposal for depot buildings after the evaluation of assessments gained form the surveyed depot buildings. In addition to that, this building has change value with its compatible wall addition which separated the big building into two which mentioned above “Section C. History of the Building D05 and Its Change”.

3.1.6. D06 Pano Graphic Studio

This depot building is on a lot which covers nearly 78 m² area. It is a one-storeyed building with a later addition mezzanine floor. This registered building is located on Atatürk Bulvarı 1st street in Fevzipaşa-Vehbibey Mahallesi which is a frequently used street. The door number of building is 1. Block number the building located on is 183 and the lot number is 3. (Figure 3.68,A) Although some interventions done like

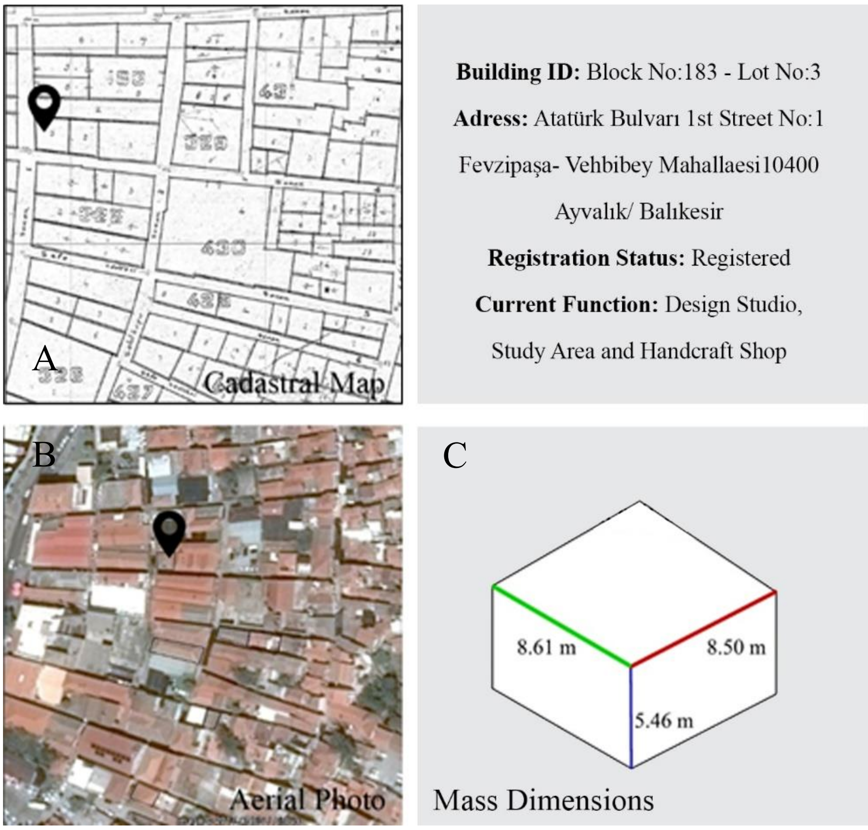


Figure 3.68. D06 Pano Graphic Studio, Image A; Location of D06 on Cadastral Map, Image B; Location of D06 on Aerial Photo (Google Earth last accessed on 25.09.2017), Image C; Mass Dimensions of D06

painting stone elements used as door posts and addition of air conditioning fan to the façade, the façade can be considered as unchanged in terms of fundamental elements. (Figure 3.71) It has a door at the centre of the façade and on both sides traditional windows with stone arched lintels are formed. It has the typical neo-classical properties with colonnades on both sides of the door, stone jambs covering timber framed windows and exposed stone masonry walls. Building has one entrance and it is opening to G-01 which constitutes the whole area of the building. (Figure 3.69) G-02 is located on the ground floor which separated from G-01 is the wet space. The mezzanine floor generated with steel construction and in a flexible manner which at some parts lean on the load bearing walls and at some parts detached load bearing steel columns. G-03 is the space generated with this mezzanine floor which is was not there in original condition of the building. From G-01 to G-03 a metal staircase was used for vertical connection (Figure 3.69).

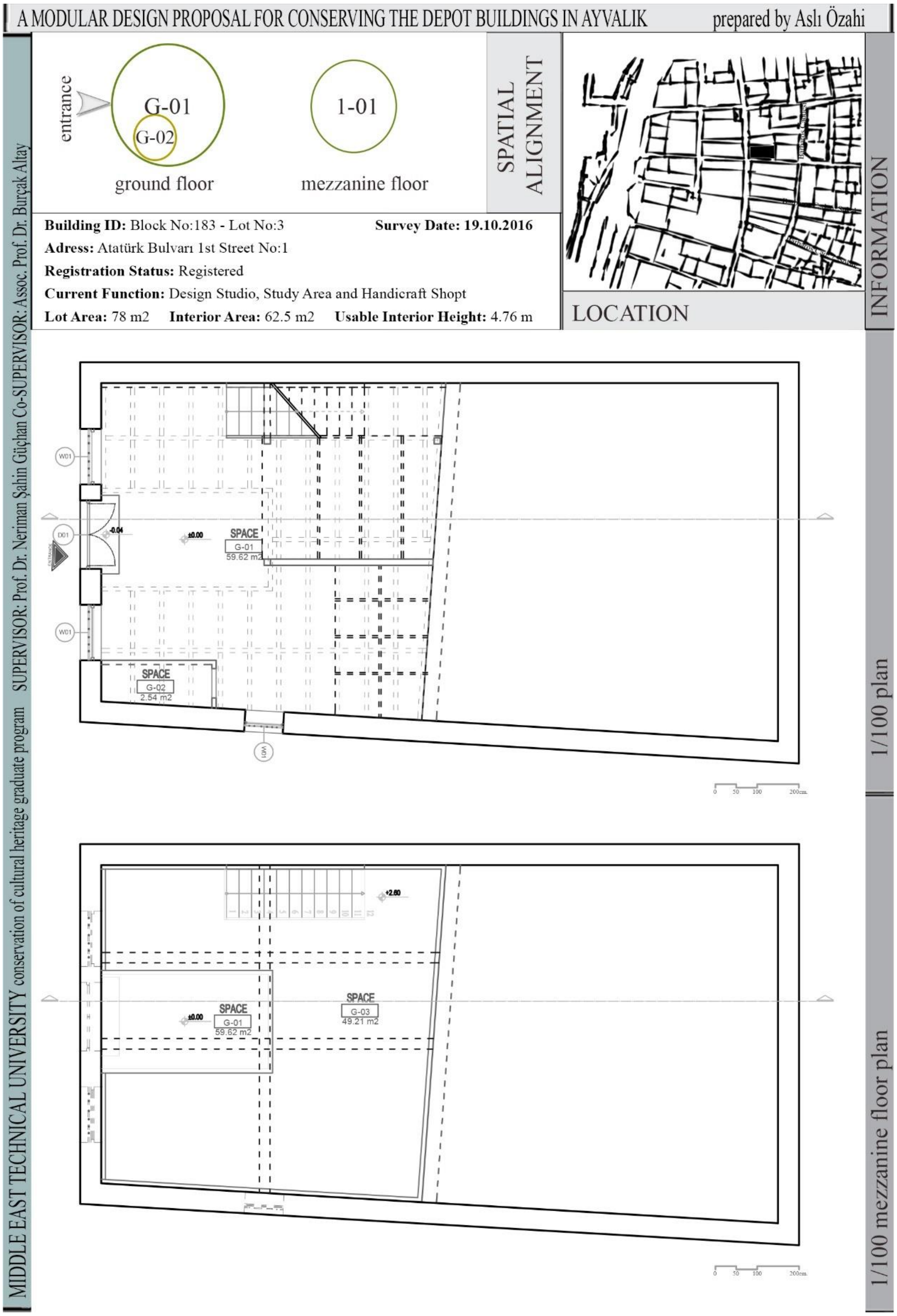


Figure 3.69. Survey Drawings of D06

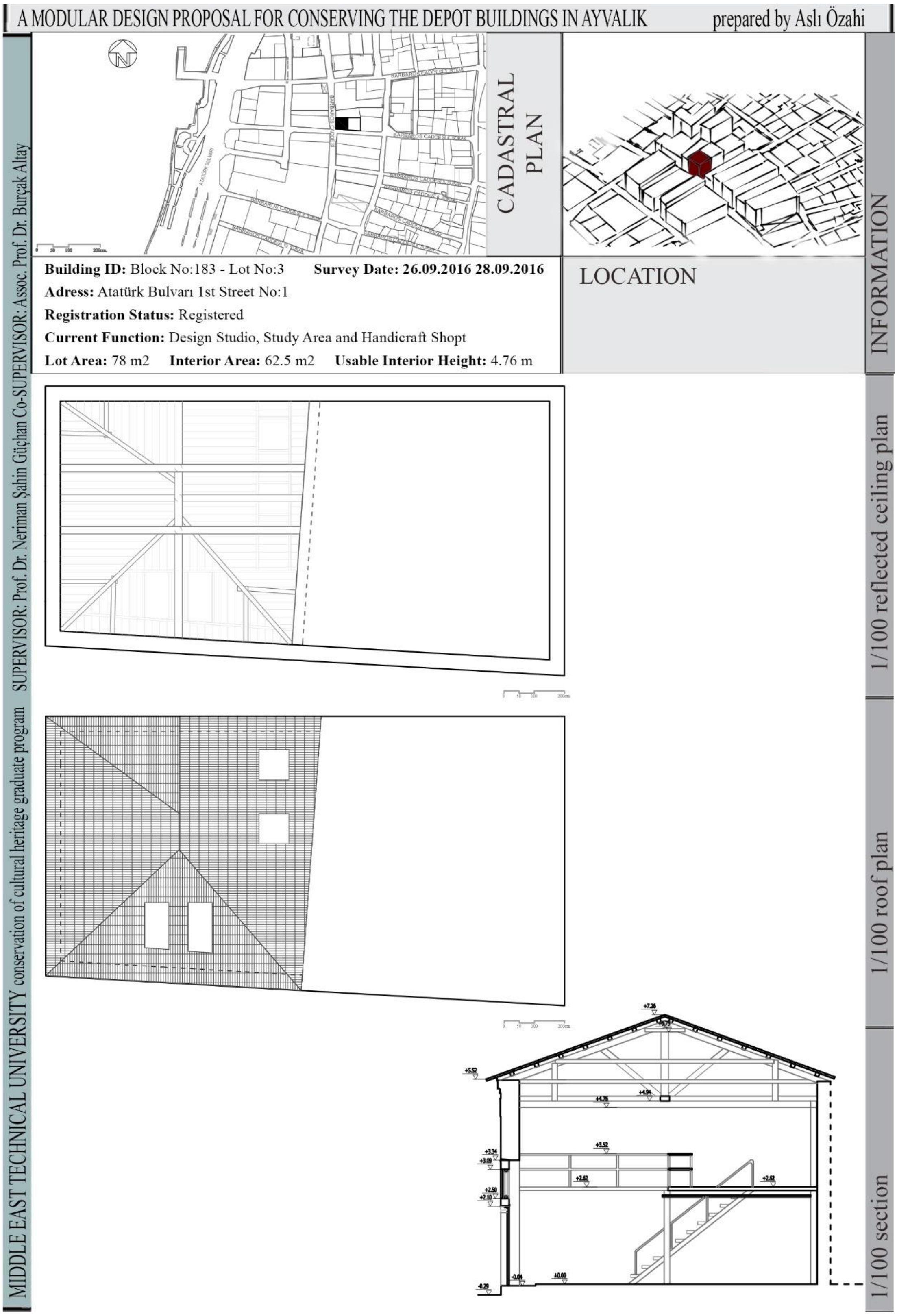


Figure 3.70. Survey Drawings of D06

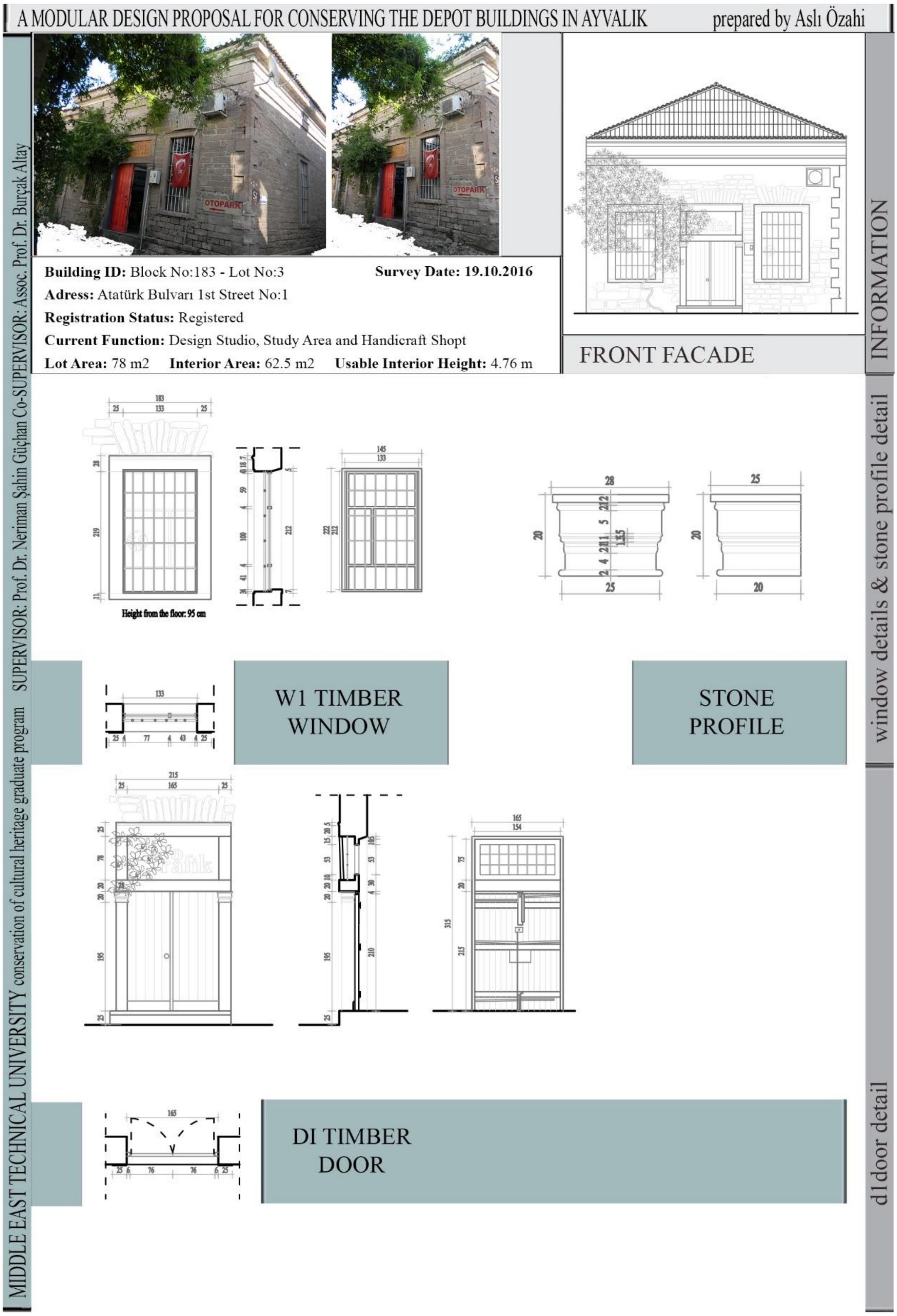


Figure 3.71. Survey Drawings of D06

a. Structural Characteristics of D06

This building structurally consists of four load bearing stone masonry walls and a four-sided hipped roof as structural element. The load bearing walls have 50 cm thicknesses. The quoin of the building is the crossing of two streets which bigger masonry cut stones used. (Figure 3.72,A) The masonry technique used for other parts of load bearing walls is uncoursed squared rubble masonry with lime mortar binding. While large stones are used on the bottom side, the stones start to thin out at upper parts. A pattern seen on the corner of the building which has a minor projection to decompose it from the whole masonry wall with clean cut corner stones as material. (Figure 3.72,A) Building doesn't have an eave but on the transition part which join roof and masonry wall, header which again composed of clean-cut stones and stone profiles is present. (Figure 3.72) Roof of the building is a trussed timber structure

Figure 3.72. Image A: Stone Masonry Walls of D06 and the Corner Pattern of the Building with Cut Stones, Image B: Stone Heading over Stone Masonry Walls, Image C: Timber Trussed Roof Elements of D06.

which designed as a hipped roof with four sides. There are two skylights which opened when the roof repairing process occurred. Traditional brick tiles are original components of the roof structure which did not affected from the repairs. At 4.95 m height, the main beams positioned and the highest level of the roof from inside is approximately 6.95 m. This ceiling height is directly affecting the ambient of the building and allow it to use with a mezzanine floor. Also, with skylights natural light provided to working area, inside-outside relationship has strengthened.

b. Architectural Elements of D06

This depot building is a typical example of depot buildings in Ayvalık with its neo-classical units composing the building. Façade elements with stone jambs covering them are; two windows with cut stone arched lentos and a door, which again has

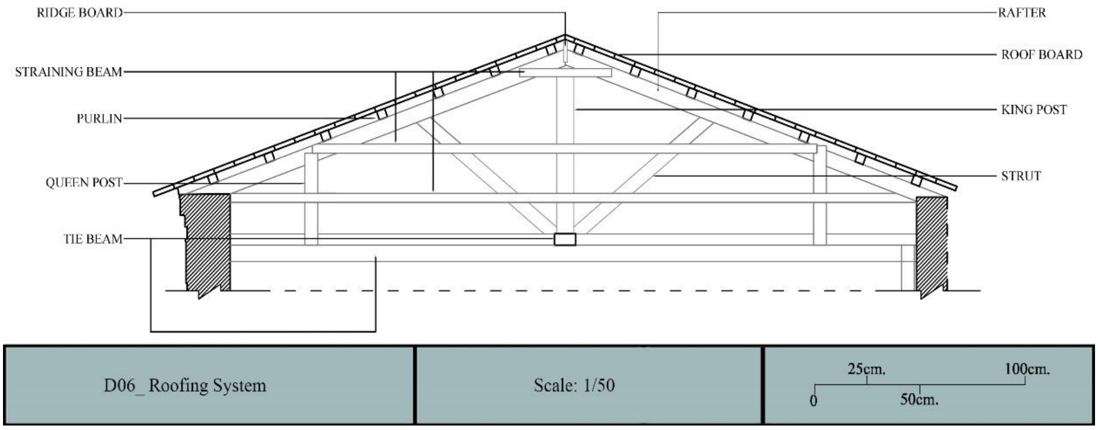


Figure 3.73. Figure Showing the Roofing System Detail of the Building D06.

arched cut stone lento over it. (Figure 3.75,A) Stone elements used for creating arched lentos formed in brick dimensions long and thinly shaped which brick material is a more common example in the field. (Figure 3.74) In total, there are three windows in the building and all of them are in same type W1. The opening dimensions of those windows are 133 cm x 222 cm. They are 75 cm high from interior floor level. Stone

Figure 3.74. W1 Type Windows of the Building D06

jambs covering them have 25 cm thicknesses. The timber framed windows have iron bars outside and their non-sashed windows are not operable. For ventilation of the inside environment inhabitants use door which stays open all day. The only door opening of the building is D1 which has 315 cm height and 165 cm width has a transom window over it. (Figure 3.75,A) It has stone profiles on the top of the colonnaded jambs framing it. (Figure 3.75,B) The building has the architectural element metal staircase which has a 130-cm width. It is a later addition coming with the metal structured mezzanine floor. It has 12 steps and 30 cm width treads which

Figure 3.75. Front Façade of D06 and Photograph of Stone Profile Above Stone Colonnades of D1; Image A: W1 Windows on Both Sides of D1, Image B: Stone Profile Detail of D1.

climbing up to 2.62 m height. The riser height is 15.6 cm and at the left-hand side when raising up, a metal handrail 90 cm high is present.

c. The Story of The Building D06 And Its Change

This building is dated back 1900-1922 based upon to the information gathered from "Emlak Vergi Beyannamesi" existed in the study made in 2005, Graduate Program of Restoration for the course REST 507 in Middle East Technical University. On that date building was used for commercial function, as an office. This information also

Figure 3.76. Photographs Showing the State of Building in 2007 and 2016; Image A: Photograph taken in 2007 (Terzi, 2007), Image B: Photograph taken in 2016 by the author.

gathered from the map prepared for showing the present functions of buildings in the same study in 2005. In 2007 building used as an architecture office. (Terzi, 2007, p. 182) (Figure 3.76,A) Current function of this depot building is a graphic studio; a place that print outs can be taken and graphic designs made for advertisements and events. (Figure 3.76,B) Commercial use of building is continuing. Some alterations had done according to the needs of the given function. Those changes from the original condition of building are listed and shown in Figure 3.77 below.

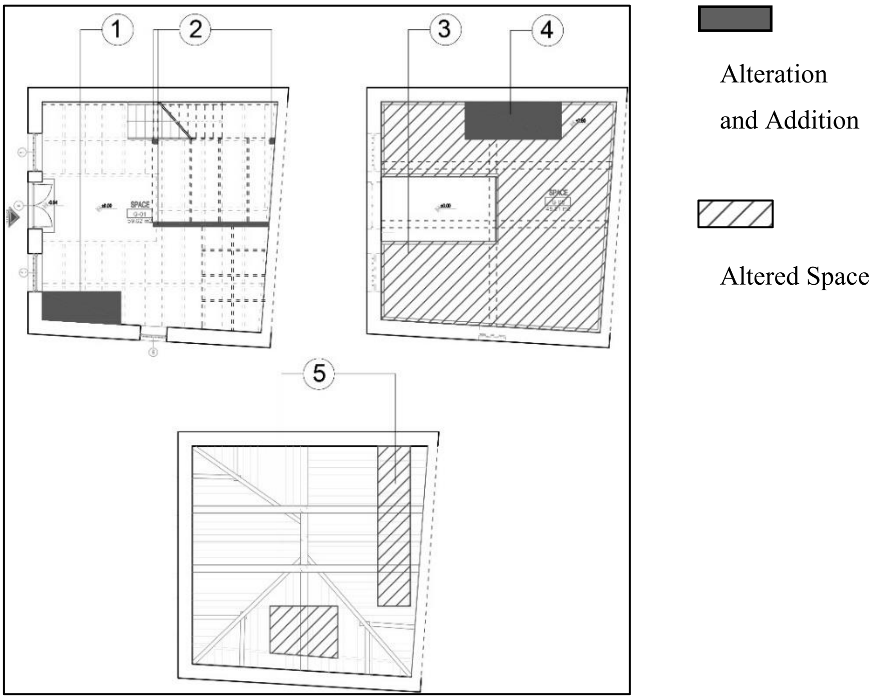


Figure 3.77. Figure Showing a Mapping of Observed Alterations on D06

1. Addition of Wet Space
   As a commercial used building, it has to meet the needs of the working people in the building. This unqualified wet space addition has approximately 2.5 m² and located on the corner of building near to two window openings. It doesn't have enough ventilation and unqualified and incompatible materials used in the construction of space.
2. Load-Bearing Metal Columns for the Mezzanine Addition
   Those additions made according to the need of a load-bearing element around the staircase opening on the mezzanine floor. The dimensions of those square cross-sectioned metal columns are 15 cm.

3. Space Addition to building with a Mezzanine Floor

   The office section of this graphic studio is situated on the mezzanine floor. With a metal structured flexible construction, extra space gained for an extra function inside the building.

4. Metal Staircase Addition

   This addition provides vertical circulation. Its material is compatible with the designed mezzanine floor although among other buildings the most seen material used for staircases is timber.

5. Opening Skylights to the Original Roofing

   This irreversible alteration provides an extra brightness to the less illuminated building. (Figure 3.78) With the addition of mezzanine floor, height of the

Figure 3.78. Irreversible Alteration as Opening Skylights to the Roof of Building D06.

space couldn’t have been perceived as the gained level of light decreased with this alteration. So, intervening to the roof with opening skylight also brings daylight to ground floor creating a light well with the space flow through the gap in the middle of mezzanine floor and it also enlightened the whole mezzanine.

d. Assessments on The Building D06

In this part problems, potentials and values of the depot building used as a graphic studio will be evaluated. The assessments about the problems of the building is barely are in a less amount numerically. Being structurally in a very healthy condition, this building differentiated from others with not having a dampness problem in interior space. The only dampness problem observed at the front façade of the building with

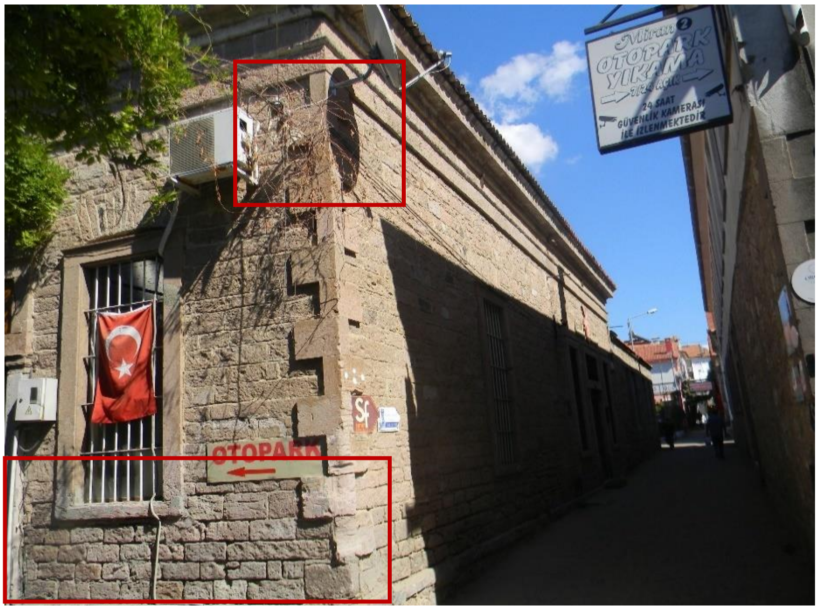


Figure 3.79. Figure Showing Problems as Loss of Mortar at Lower Parts of Stone Masonry Wall of D06 and Air Conditioner Fan as Disrupting Façade Unity.

observation of material loss. At lower parts of the masonry wall, mortar loss is seen as a result of water accumulation. (Figure 3.79) Apart from that, the problem caused by the main purpose of the construction of building which don’t have any climatic insulation. It only has a controlled sunlight for not having excessive hot air inside the building to preserve goods in it. Although Ayvalık has a temperate climate whole year, inhabitants of depot buildings usually use heating stoves inside the buildings and some of them use air conditioners for heating and cooling the indoor climate. A problem about this issue is the air conditioner and its outdoor unit which disrupts façade integrity. (Figure 3.79) The traditional front façade appearance tampered with the outdoor fan and as it mounts up in number in whole traditional landscape vista became disrupted by them. Having need of artificial climate control also shows that, insulation is an important problem for continuous inhabitants of the buildings. On the contrary to the healthy structure, problems are present which caused by the function and inhabitants of the building. Another is the wet space addition which doesn't adequate for the building both in size and material.

At present state minimum five people are working in the building and it can be change as the customers and people coming there for consultancy increase the population in building. As this kind of a function which have a population inside, the size and quality of the wet space is in a very poor quality and condition. It doesn't have any ventilation gap notwithstanding being next to two windows.

Looking from a different perspective, a problem is lighting fixtures which used for dark times of the days. The one type of lighting fixture used in Pano Graphic Studio is the projector light which fixed on the timber beam of roofing structure. (Figure 3.80,A) The other lighting fixture used in building is traditional horizontal florescent lamp which frequently seen in depot buildings. (Figure 3.80,B) Fluorescent lamps have been used as ground floor lighting under the low ceiling spaces created with the addition of mezzanine floor. The projector light is a powerful lighting fixture in terms of the power of light. It usually used as outdoor lighting fixture for architectural lighting. The way fixtures assemblage is the problematic thing that they only fixed on the roofing structure without any intervention decision taken. This assembly creates a scattered image for the building with electric cables and fixtures disorderly fixed on roof and walls.

The potentials of this building are starting with being structurally healthy. It stands as a full building around 95-117 years with some bare and basic repairs and additions. This shows that, this building is durable among seismic activities and aging effects. It has a great potential for the future generations and conserving itself as a part of traditional industrial pattern of Ayvalık. The size of building is not as big as some other depot buildings but, the present potential of ceiling height used with mezzanine addition. This alteration is also a potential for future spatial changes as it is a demountable and flexible addition which only rest among stone masonry walls. The potential of the location of building can be listed because of being corner building of intersecting two streets.

The age value of those depot buildings is too important which mentioned also as a potential. They are representatives of form of living 100 years ago, in that kind of an industrial landscape. This building also a decent example of depot buildings in Ayvalık and it is valuable for being a piece of a whole. The traditional façade

Figure 3.80. Lighting Fixtures Used in D06

arrangement and stone masonry walls are empowered and strengthens the feeling of unity.

3.1.7. D07 Empty Depot Near Seaside 1

This depot building is standing approximately 100 m² lot area. It is registered according to the information gained from the person in charge about the building and located vertically between two horizontal streets Karantina street and Balıkhane street. There are two entrances of building each facing these two streets. Among other depot buildings which locates in a denser traditional pattern at the south, this depot building

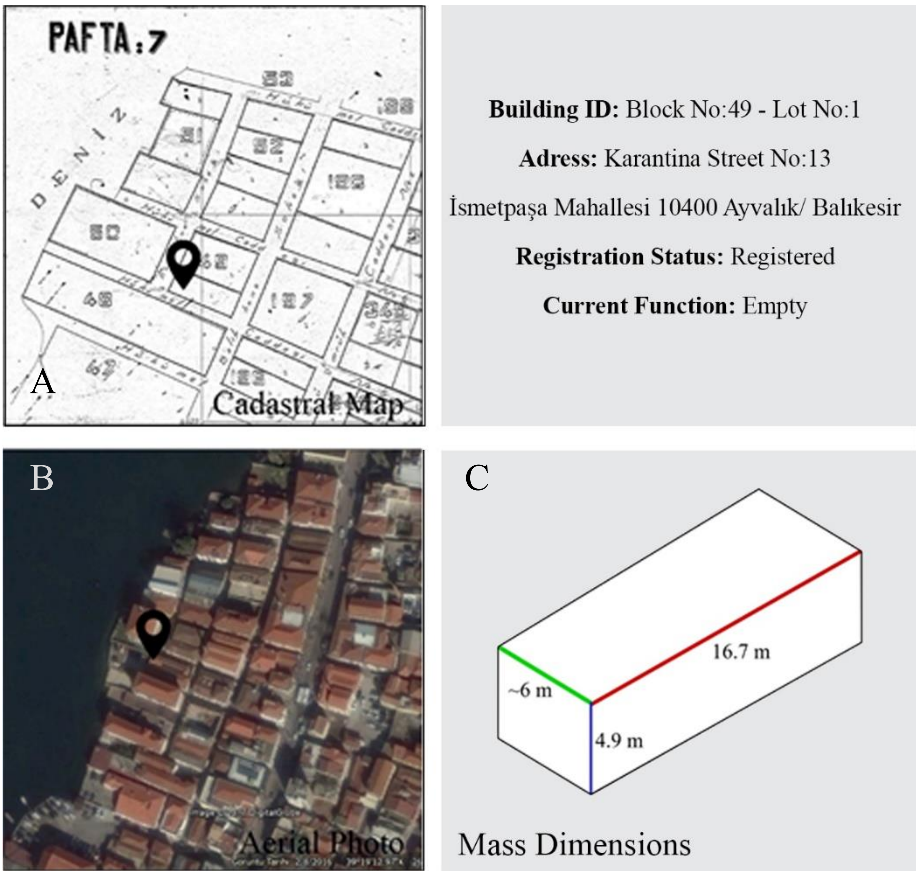


Figure 3.81. D07 Empty Depot Near Seaside 1, Image A; Location of D07 on Cadastral Map, Image B; Location of D07 on Aerial Photo (Google Earth last accessed on 25.09.2017), Image C; Mass Dimensions of D07

is in the northern part, behind Ayvalık city square. At that part, again industrial city scape continues with olive oil factories and depots parallel to the seaside. The façade organisation is same with most of the depot buildings with centralised door and two windows on both sides in each façade of the building (Figure 3.84). It only has different characteristic about stone jambs covers around windows and doors of the building. Unlike other depot buildings, in this building arched lentos of openings spanned not with brick arches, but 25 cm wide stones were used for this. A key stone on each opening can be seen at the headings of stone jambs.

Another difference of this depot building is being fully plastered from inside to outside

Figure 3.82. Figure showing space partitions; Image A: G-02 space, Image B: spaces G-03, G-04, 1-01

unlike other depot buildings, stone masonry is not exposed. This is probably a later time intervention but, observation of walls becomes difficult in this plastered condition. At present state building is not in use but waiting for rental. From both entrances, the welcoming space of building is G-01 which is also the main space of the building. Besides, the entrance from Karantina Street was not used by the previous inhabitants so entrance from Balıkhane street acts as the main entrance of building with partition wall at welcoming area which emphasize it. (Figure 3.85,D) Other small spaces are separated from G-01 to create space for other needs of building while it was in use in the past. G-02 is a semi-closed low ceiling space located in front of the W01. (Figure 3.85,A) A disused coal stove is standing at this space. G-03 is the wet space which again a separated space from G-01. (Figure 3.82,B) This 2.4 m² space does not have adequate equipment and satisfactory size for a functional use. Besides, space G-04 is a designated office for this building. (Figure 3.85,B) Although building is not in use, this office space has some office furniture and a desktop computer in it. Over those three spaces G-02, G-03, G-04 a mezzanine floor located and space 1-01 created above G-04. (Figure 3.82,B) The lack of vertical circulation facility obstructs observation of 1-01 space from inside but, this space is called as storage room by the responsible person of the building.

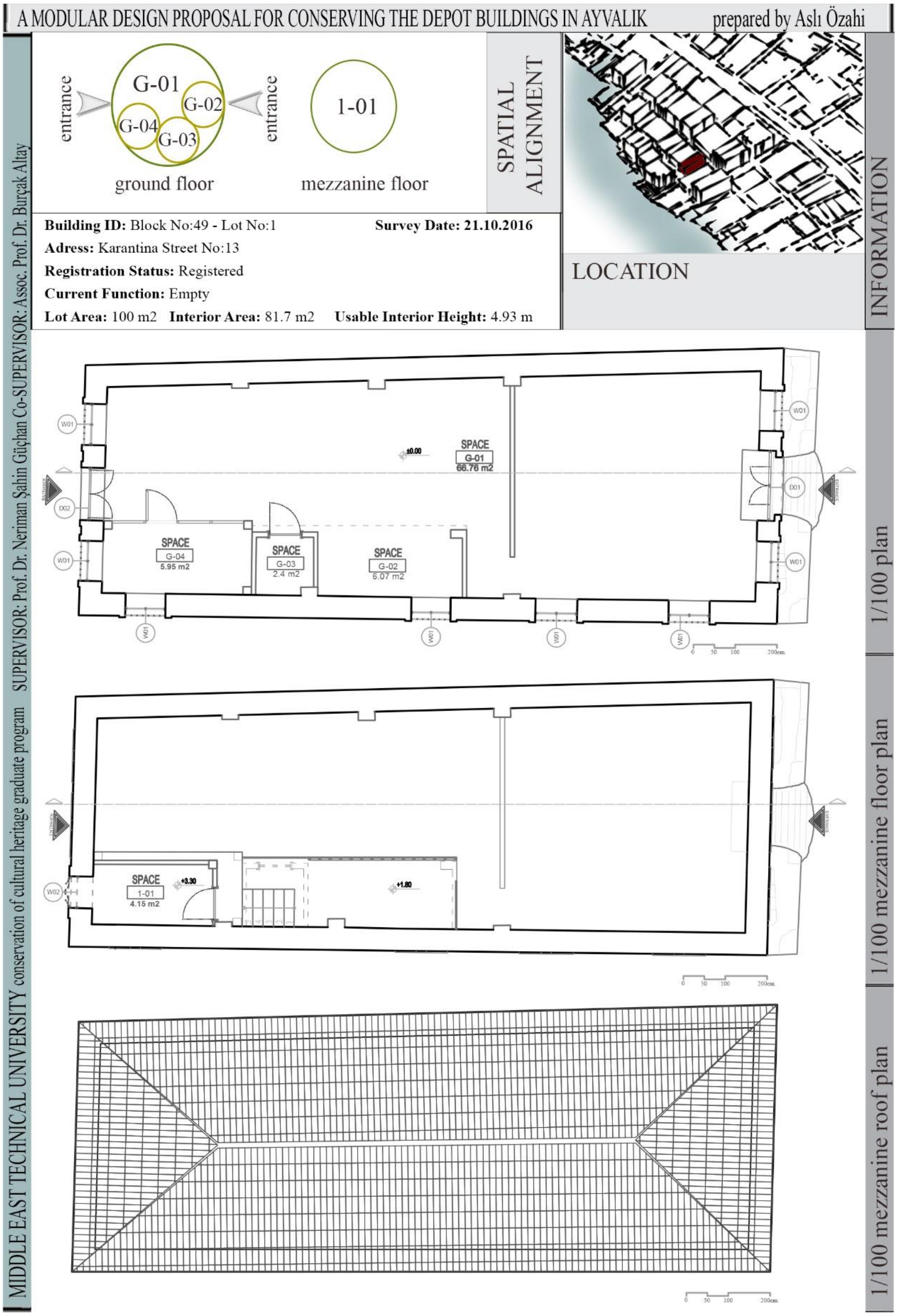


Figure 3.83. Survey Drawings of D07

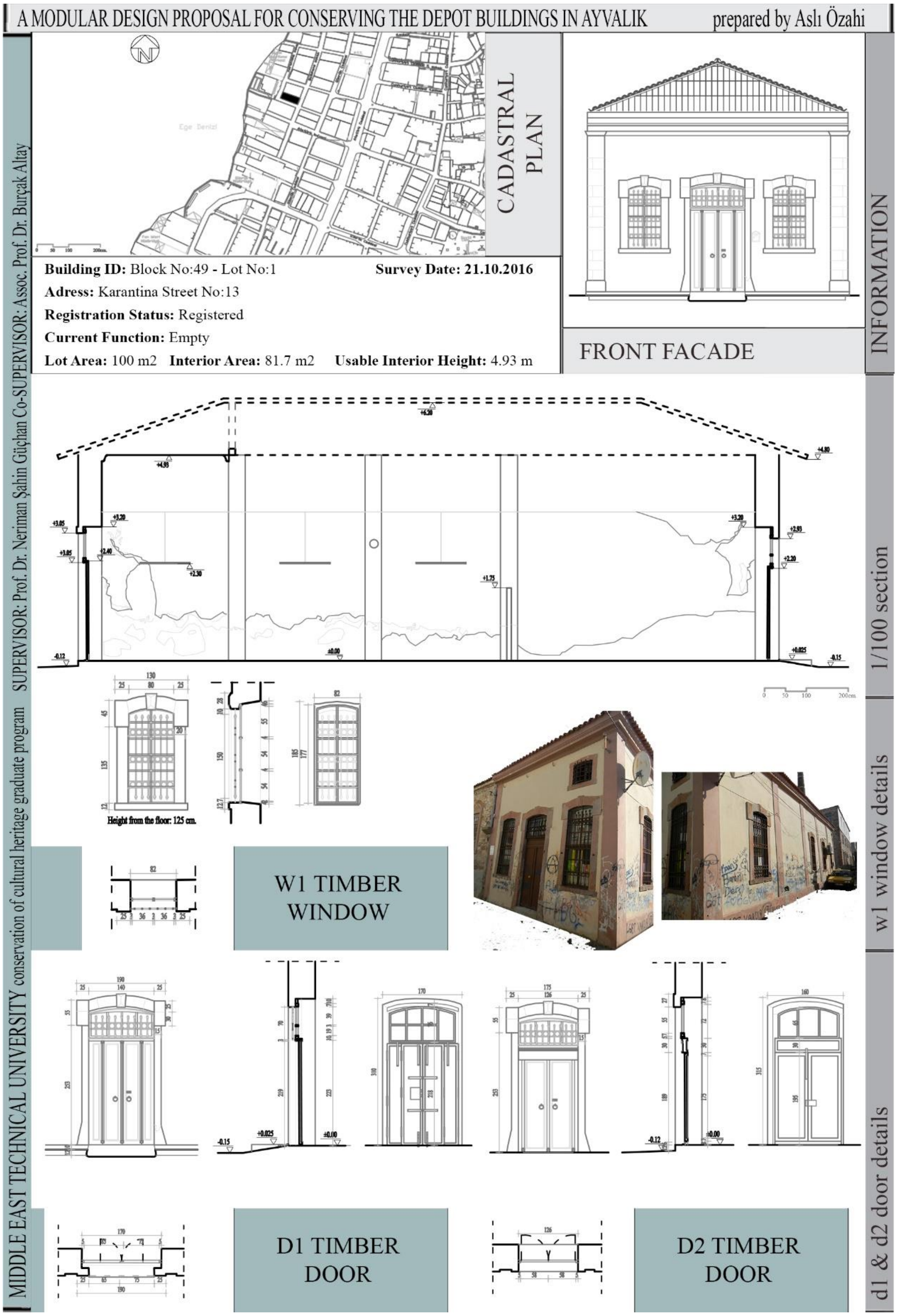


Figure 3.84. Survey Drawings of D07

a. Structural Characteristics of D07

This depot building is like most of other non-altered depot buildings, constituted from four stone masonry load-bearing walls, which their thicknesses are 53 cm. Those stone masonry walls were plastered from inside and outside so, this situation doesn't allow observation of masonry technique of them by the author. At the corner of the depot building from outside, non-plastered cut stone "sarımsak taşı" quoins are framing the whole building. Also, another challenging alteration was made as column alike vertical elements, which shows building as it is a reinforced concrete building. (Figure 3.85,C) They are plastered but, in a poor condition of unqualified technique which shows their later addition to building. Approximately 20 cm wide and 10 cm width

Figure 3.85. Some Details About Space Allocation and Spatial Additions, Image A: Mezzanine Floor and Space 1-01, Image B: Timber Partition Walls of G-04 , Image C: Vertical Column Like Plastered Elements to Stone Masonry Wall of D-07, Image D: Partition Wall Which Divide G-01 into Two Parts.

three columns are aligned among both longitudinal walls opposing to each other. Their material couldn’t be identified because of plaster.

Again, the same problem of not observable structural material seen in partition wall which divides G-01 into two. (Figure 3.85,D) It has 12 cm thickness and 1.75 m height which only visually obstruct the back area of G-01. Other partition walls have different kind of construction techniques. The ones which generate G-02, and G-03 spaces are constructed with concrete. (Figure 3.82,A,B) They are also load-bearing elements of the concrete mezzanine floor. Those partition walls have variable thicknesses at about

Figure 3.86. Interior View of the Roofing with Blanket, Which Obstruct Observation

10-20 cm, and they are mostly plastered and painted although some parts detached, and exposed concrete can be seen. G-04 had separated from other spaces with partition walls which have timber columns with woodworking and timber panels with slatted windows. (Figure 3.85,B) The whole panels and columns painted in the colour orange. The last partition wall belongs to space 1-01 which vertically continuing structure of timber columns in G-04. (Figure 3.82,B) Among those columns fill-in made by gypsum panels to separate this space visually and physically.

Another structural item that need to be mentioned is the concrete mezzanine slab and its features. (Figure 3.82,A) This slab sits on the concrete load bearing walls which formed spaces G-02 and G-03. 15 cm thickness beams are forming the construction structure of this mezzanine and concrete slab laid among those beams. The thickness of slab is 10 cm. In this kind of single-spaced depot buildings roofing structure is a major and important construction item. In this building, unfortunately observation of roofing obstructed by a blanket stretched under it. (Figure 3.86) From the aerial photo, it can be identified that it is a hipped roof with four sides. Although it is not exactly visible it is absolutely a trussed timber roof structure with trusses. Original traditional brick over & under tiles are present and located on roof boards. As seen in Figure 3.86 at the interior quoin of building, that part of the roof altered with new timber material. As other parts are not visible, the level of change about structure is not clear. Floor covering of building is concrete screed. At different parts of building plastic sheet materials with laminated parquet prints on them laid to floor as floor finishing's with an unqualified workmanship.

b. Architectural Elements of D07

Openings of building are the only architectural elements of those single-spaced depot buildings. This building, which has a different style in terms of architectural elements among other depot buildings studied for this thesis, has two entrances and two door types. D1 is located on the façade which faced Balıkhane street. (Figure 3 82) The dimensions of the opening are 170 x 310 cm. The timber door height is 218 cm. D1 has a transom window over it with ornamented iron bars. It has cut stone jambs and the arched lento is formed by 5 cut stones including ornamented key stone. D2 is narrower than D1. (Figure 3 82,C) The dimensions of the opening it creates are 305 x 125 cm. The height of timber door is 195 cm. Like D1, D2 has also a transom window with ornamented iron bars. As it is narrower than D1 the arched lento is constructed with 3 cut stones which one of them is the key stone. Total opening dimensions of D2 are 160 x 315 cm. W1 is the window type that 8 windows of building are in this type. (Figure 3.87) Dimensions of the opening that window constitutes, 186 x 82 cm.

Although dimensions of them vary 1-5 cm, proportions of those 8 windows are the same. Their height from interior floor level is 125 cm. They all have the same ornamented iron bars on them. Except one window which located at G-04 on the façade facing Karantina street, all windows have non-operable timber window frames with no casements. The one in G-04 changed by the previous inhabitant with two-sashed timber casement window.

Originality of the timber window frames is controversial because of being non-operable windows and the colourful glass at the upper parts of windows. Jambstones on both sides have 20 cm width. On the other hand, the only different window in building W2 is located at the upper part of the façade which faced Karantina street.

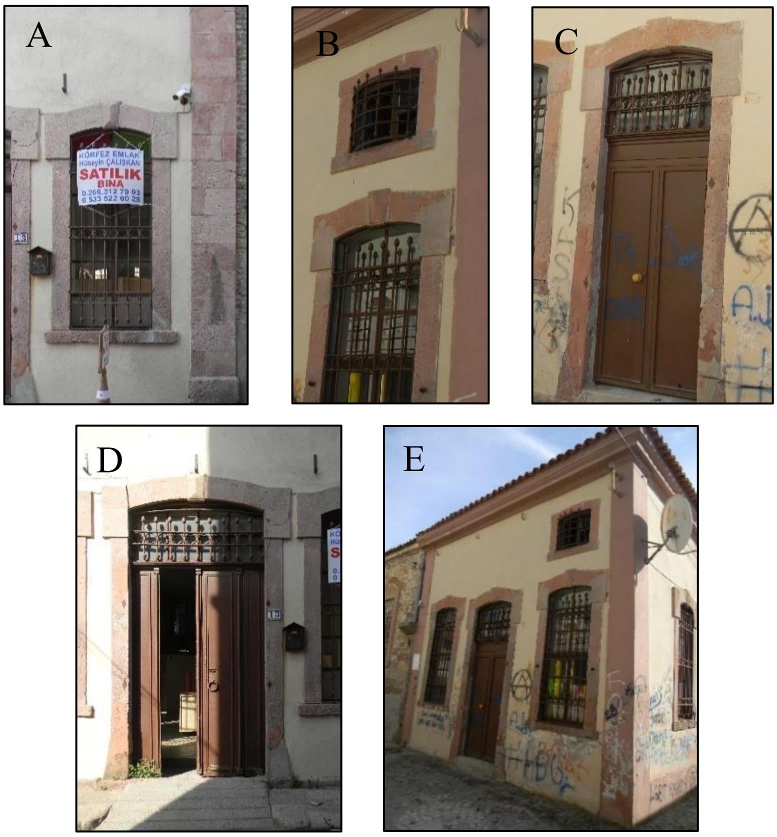


Figure 3.87. Image A: W1 Type Window, Image B: W2 Type Window, Image C: D2 Type Door, Image D: D1 Type Door, Image E: West Facing Façade of D07

(Figure 3.87) Window measurements could not be obtained because there is no vertical circulation to the mezzanine floor. This window acts as the window of 1-01 located on mezzanine floor. It is a casement window with two sashes and like other windows of the building, it has ornamented iron bars on it.

c. The Story of Building D07 And Its Change

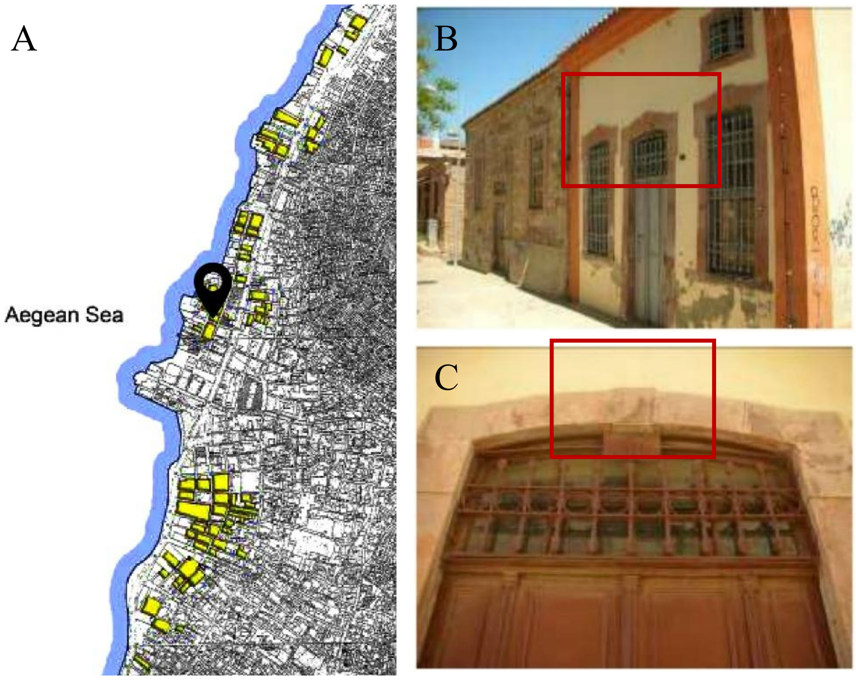


Figure 3.88. Location of D07 and the Photographs taken in2007; Image A: Revised Map Showing the Location of D07, Image B,C: Photographs Showing the Façade Facing Karantina Street and Inscription at the Entrance. (Terzi, 2007, p. 132)

After the transformation of traditional olive oil production in the last quarter of the 19th century establishment of olive oil factories production demand and surplus of the goods produced was increased. This is, one of the buildings which built for the storing surplus olive goods in a depot building. As mapped in Esra Terzi's thesis (Figure 3.88,A) this building belongs to early 20th century. (Terzi, 2007, p. 31) The exact year that it was built was also existed when the photographs taken by Esra Terzi in 2007.

On that date, the inscription panel on the entrance door shows 1910 as the construction date. (Figure 3.88,B,C) Also, according to the same study done in 2007, building was abandoned. The present situation of building shows that, the time between 2007 and 2017 building was used as an office for some time in the past and some alterations made inside for this function. Now, building is abandoned again and waiting its new inhabitant to rent it. Some alterations had done according to the needs of the previously given functions. Those changes from the original condition of building are listed and shown in Figure 3.89.

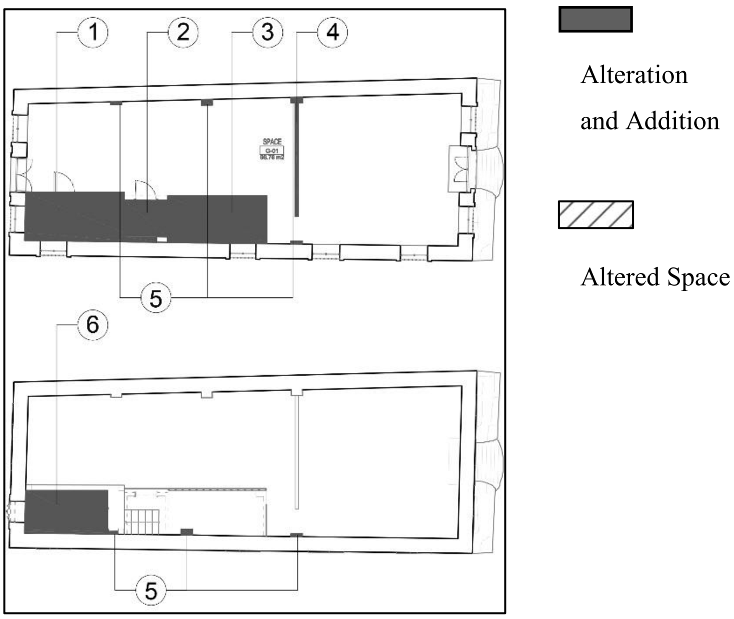


Figure 3.89. Figure Showing a Mapping of Observed Alterations on D07

1. Addition of Office Space
   The space G-04 is an office space which was added to the building for a previous function of it. The partition walls of this space dividing the space from the whole of D07 have timber wood working panels which have slatted colourful windows on it. The paint of the timber panels is in orange colour and panels have some motifs on them.

2. Addition of Wet Space

   This spatial addition was added in terms of the need of a wet space for the office inhabitants, past users of the depot building. It is located in between two partition walls of G-02 and G-04. Approximately 2.5 m^2 wet space is created with some unqualified finishing materials and it doesn't have any ventilation to outside of the building.

3. Addition of Semi-Open Space

   That space is coded as G-02 as seen in Figure 3.82,A it is an empty space under the concrete framed mezzanine floor.

4. Addition of Partition Wall

   The partition wall is dividing the entrance from the office space and with the wall of G-02 they create a maze-like transition area which can be identified as a spatial division for using the building in an optimal way.

5. Addition of Column like Elements on Walls

   As mentioned before under the structural analysis of D07 title, those vertical elements added latterly to the stone masonry walls are showing building as a concrete structured building. The reason for the construction of those elements is unknown.

6. Addition of Mezzanine Floor

   This addition brings approximately 15 m^2 space to building and an additional closed room which couldn't be reached at present state of building.

d. Assessments on The Building D07

This building, which stands for more than 100 years, is structurally sound in a very good condition. General structural elements and architectural elements of building like load bearing masonry walls, openings and roof structure is in a very good condition. Only problem which observable from the interior walls is dampness problem. (Figure 3.90) The rising damp problem is the reason of the detachment of interior plaster at the lower parts of wall interiors. This problem caused by the lack of rainwater drainage and accumulation of rain water at the skirts of wall. Particularly on both entrance doors there are thresholds which have insufficient height to block rain water coming inside. Although in most of the buildings this kind of water accumulation problems usually occur in roof structure because of the lack of gutters, in this building rising damp problem is observed. This also can be a result of incompatible material use on the masonry walls as plaster.

Another small problem of the building D07 is a similar problem with other studied depot buildings, the insufficiency of the wet space area and lack of enough ventilation for this function. In this building, the separated area G-03 for wet space is 2.4 m². (Figure 3.82, B) It does not have enough ventilation which again bring out as a problem for the inhabitants of building.

Figure 3.90. Dampness Problems in the Building D07; Image A& B: Rising Damp Problem in Different Parts of Building.

Another insufficient feature for the inhabitants of building is lighting. There are three florescent lamps which mounted on the north facing wall which supply the whole light of 100 m² area. Although they diffuse enough light for the building technically, ambiance of building is very important for the users which doesn't fulfil the visual pleasure. With a more planned lighting design sense of space and emphasis on the strong points of the building can improve. Again, mounting those lamps directly on the wall is damaging the wall unity which creates problem.

Another problem different from non-plastered depot buildings is the street writings on the west, east and south facades. As those facades are plastered, they became victims of graffiti which cannot be counted as artistic works. As it is known that this building is 107 years old. Besides some alterations made within years passed, according to the written and graphic sources it has original architectural features and this building is the part of the traditional industrial pattern of Ayvalık. It brings the potential of standing there for more years, for the future generations if the sustainability of use condition continues. With some small repairs and revisions about latest alterations, building became a shelter for any sufficient function which means it has a great potential both for locals and single owner of the building. It has some other depot neighbours near to seaside which can be handled together as a new potential which born from the location of those buildings.

All potentials of the building bring values to building. The age value of the building cannot be ignored in anyway. From a different point of view the use value of it is also a very important value for this building. Although it stays abandoned sometimes in history, for some different functions this traditional neo-classic featured building was used, and this add extra value to this single-spaced building. It has traditional value coming from its construction technique, façade type and planimetric shape. Over again, being a part of a whole industrial production, individually is making this building a precious example of cultural inheritance of Ayvalık.

3.1.8. D08 Empty Depot Near Seaside 2

The last depot building studied in this thesis is an abandoned depot building D08, which covers the whole lot with a size approximately 155 m². It is a registered building located on the block number 52 with other depot buildings next to it. Lot number of the building is 1. (Figure 3.91,A) Open address of D08 is; Balıkhane Street No:8 İsmetpaşa Mahallesi, Ayvalık. Building have two entrances. One of them is from Karantina Street and the other one is from Balıkhane Street. Door number from Karantina street was not present when the field study done. On both facades, classical door and window layout is seen with doors in between two windows.

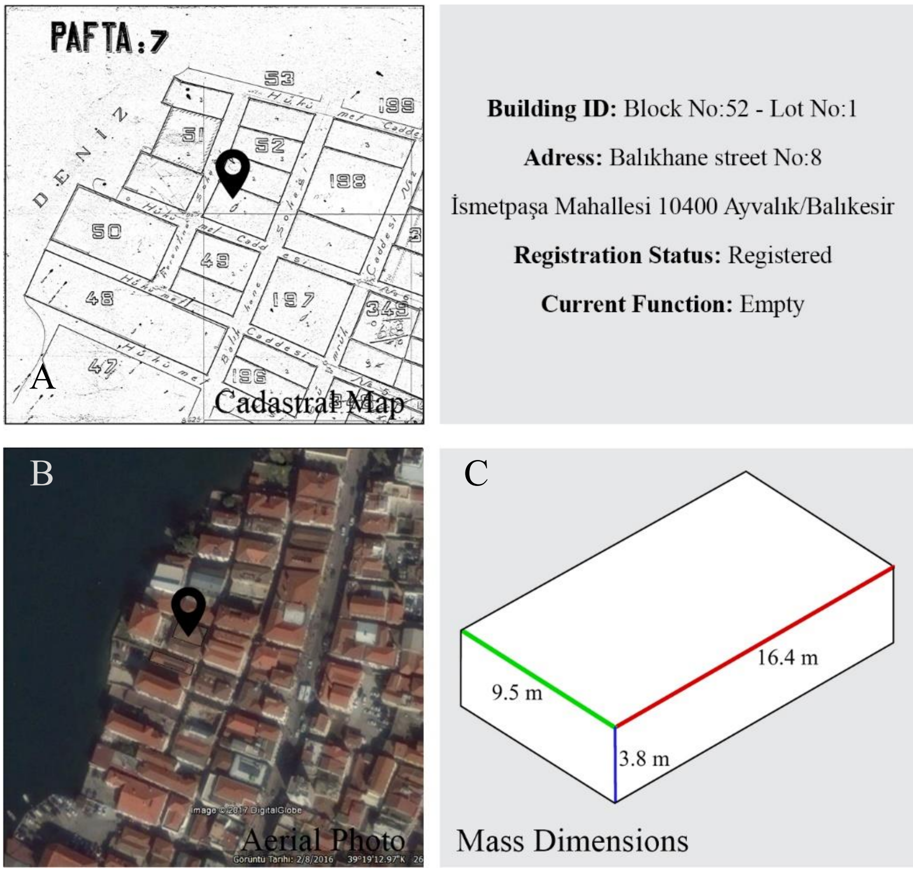


Figure 3.91. D08 Empty Depot Near Seaside 2; Image A: Location of D08 on Cadastral Map, Image B: Location of D08 on Aerial Photo Photo (Google Earth last accessed on 25.09.2017), Image C: Mass Dimensions of D08

(Figure 3.94) This depot building doesn't have interior partition so, it has a single space which coded as G-01 (Figure 3.92). The grids at the ground floor suggesting that building has been resumed the production and / or storage function in the past. Nevertheless, it is not in use at present state.

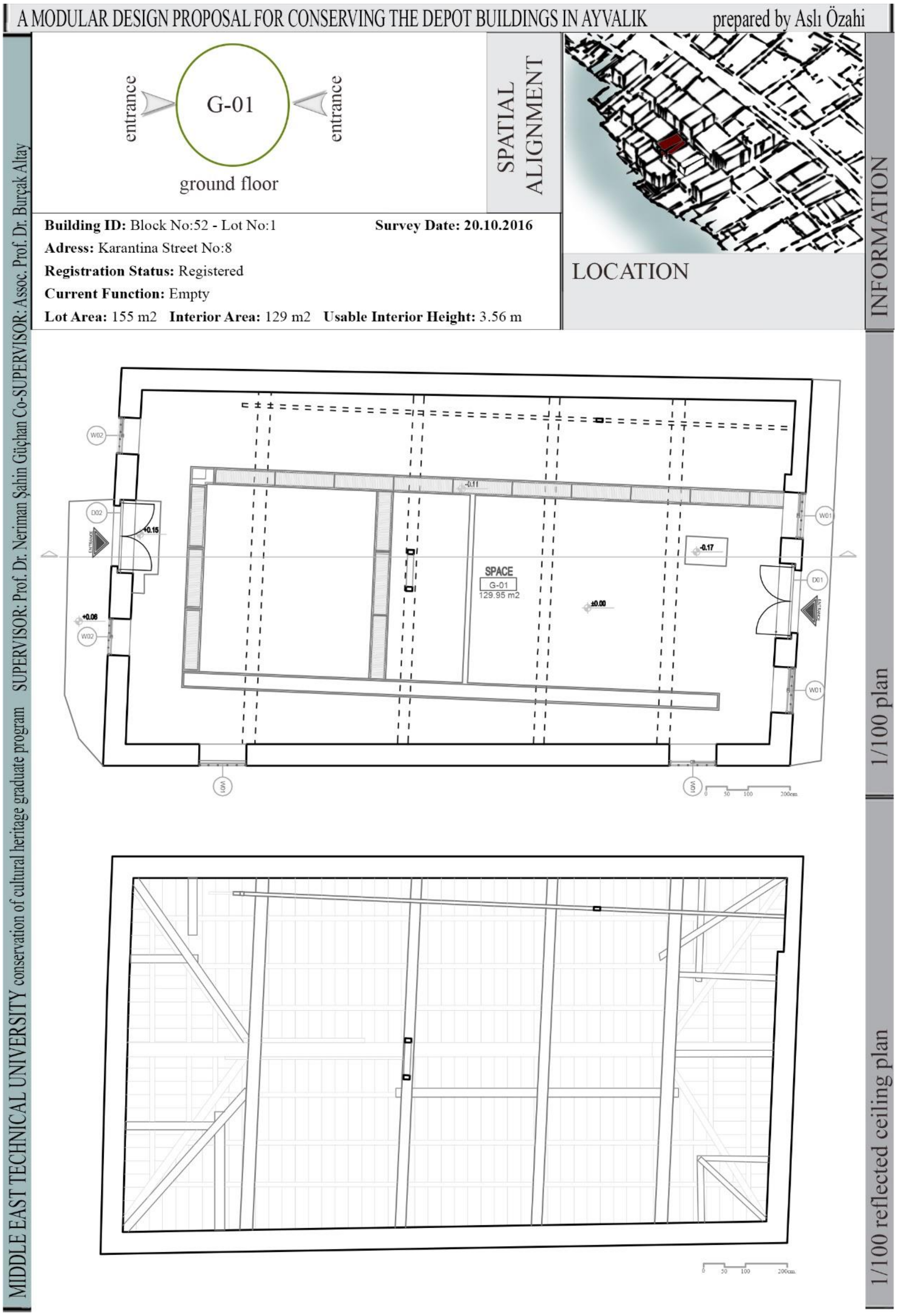


Figure 3.92. SurveyDrawings of D08

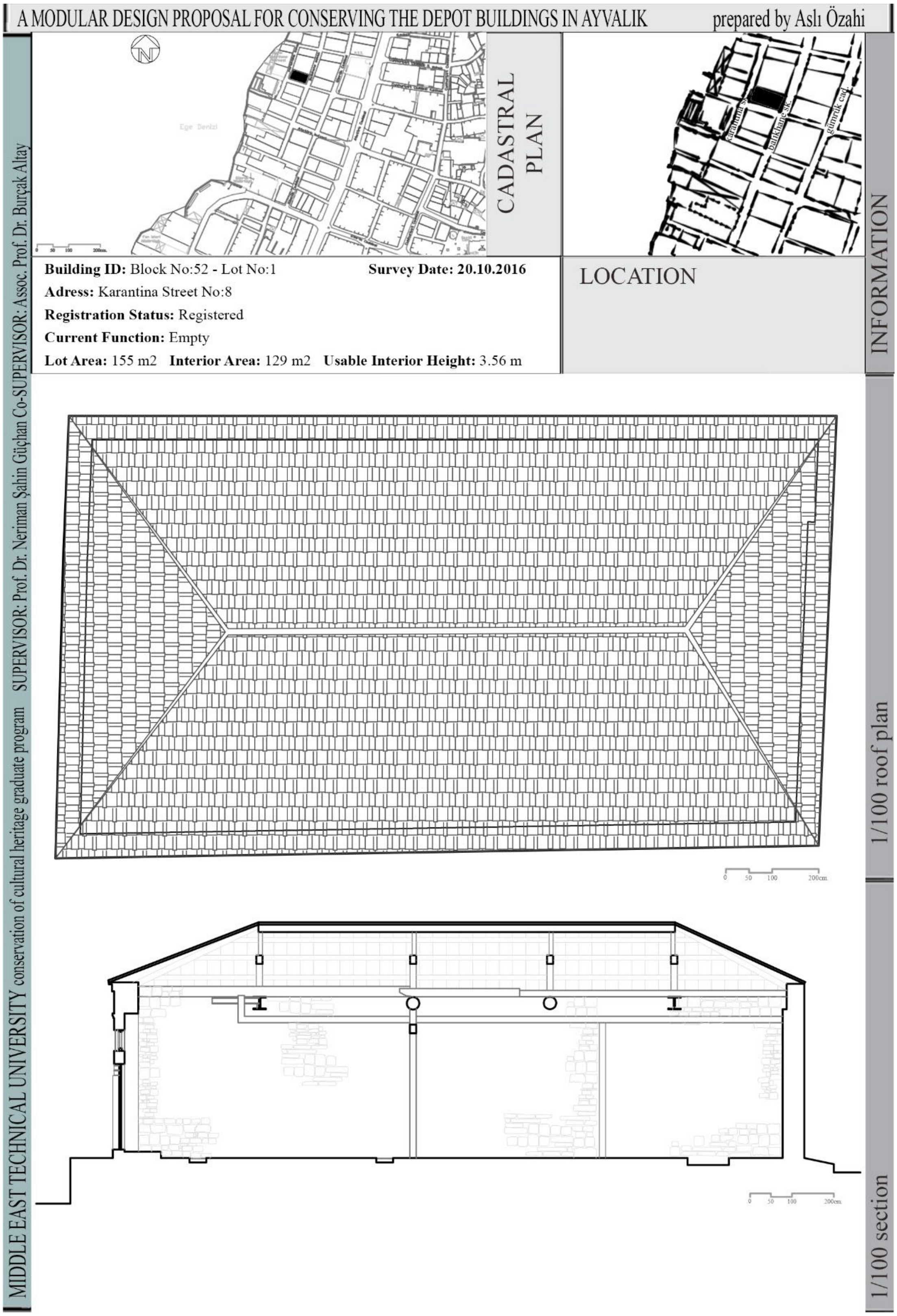


Figure 3.93. SurveyDrawings of D08

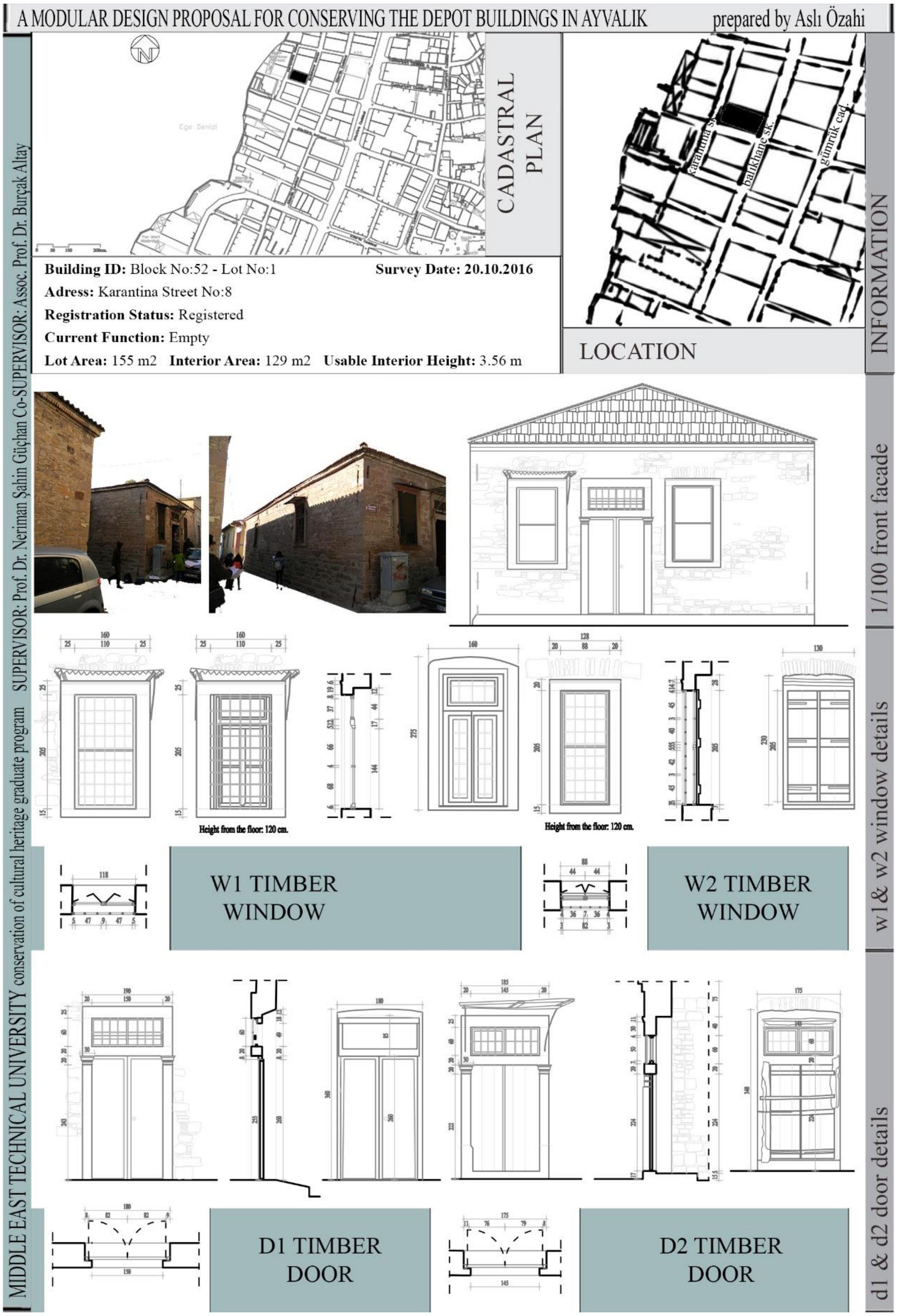


Figure 3.94. SurveyDrawings of D08

a. Structural Characteristics of D08

This building was built with squared rubble stone masonry technique with brick pieces are binding with lime mortar and the stability of the walls has provided by using big corner cut stones as in other studied depot buildings. It has four masonry load-bearing walls with 52 cm wall thickness. At the quoins of the building tension bars used for reinforcing masonry walls. (Figure 3.95)

As roofing structure, a complex timber trussed system used. Some small alterations

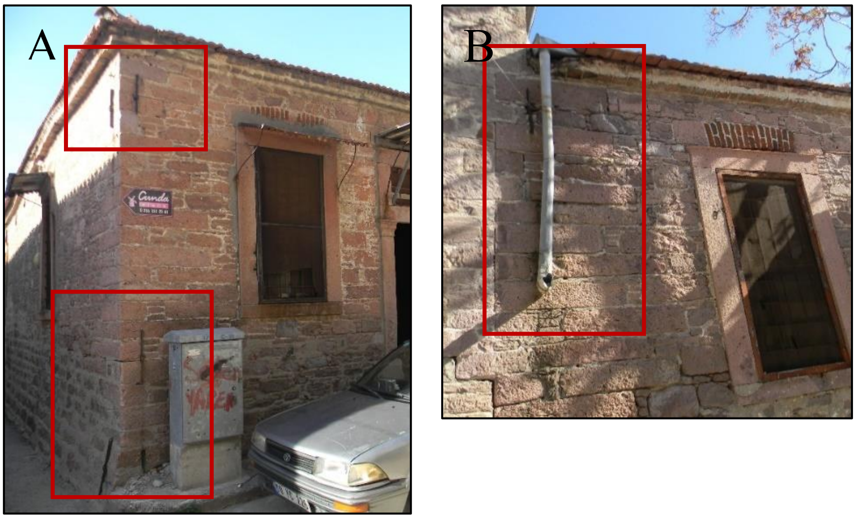


Figure 3.95. Use of Tension Bars at the Quoins of D08 and Gutter Which Added Later to Building.

with additional timber and metal elements can be observed but most of the original elements are present at this stage of building. In construction of the roof structure 4 trusses were used. The timber beams have 25 cm thickness. As shown in Figure 3.96 one of the beams shown as number 1 altered with addition of new material. An I beam with 20 cm thickness used as the beam of one of the trusses. In Figure 3.96 new architectural element addition has shown as number 2, which added for supporting the spanning beam over it. Those are 15 x 10 cm dimensioned two timber posts with a

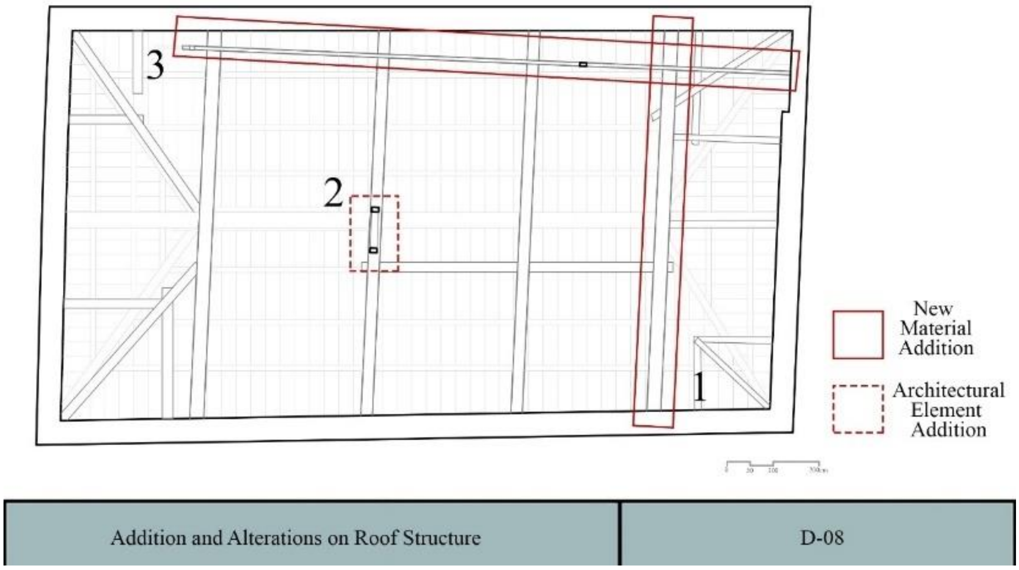


Figure 3.96. Image Showing the Alterations on Roof Structure

small timber bonding beam. (See Survey Drawings in Figure 3.93)This architectural feature is there only for supporting the spanning system. Again, the addition numbered as 3, is also to support spanning beam. This was made with metal skeleton addition which have 8 cm thickness. This addition constitutes by horizontal box frame beam spanning under all trusses and a single metal box frame post. (See Survey Drawings in Figure 3.93)

As roof tile Marseille type interlocking tiles are present at this state of building and a later added gutter is present can be seen from the façade facing Karantina street. (Figure 3.95,B) Floor covering of the entire building is concrete screed. Some channels and cast-iron crenels are observed on the flooring. The exact function of them are unknown. (Figure 3.98)

b. Architectural Elements of D08

On both facades of the building D08, an entrance door and two window openings are existing. D1 is the entrance door from Balıkhane Street. (Figure 3.97,A) Dimensions of the door opening are 180 x 360 cm. Transom window is 170 x 80 cm in size. D1 doesn’t have an exposed arched lento over it from outside, but from inside arch can be read. (Figure 3.97,A) D2 is the second entrance which located on the façade facing Karantina Street. (Figure 3.97,B) It is smaller than D1 in size. The dimension of the door opening is 175 x 341 cm. Dimensions of the transom window over timber door are 145 x 60 cm (Figure 3.94). There are two different window types in depot building

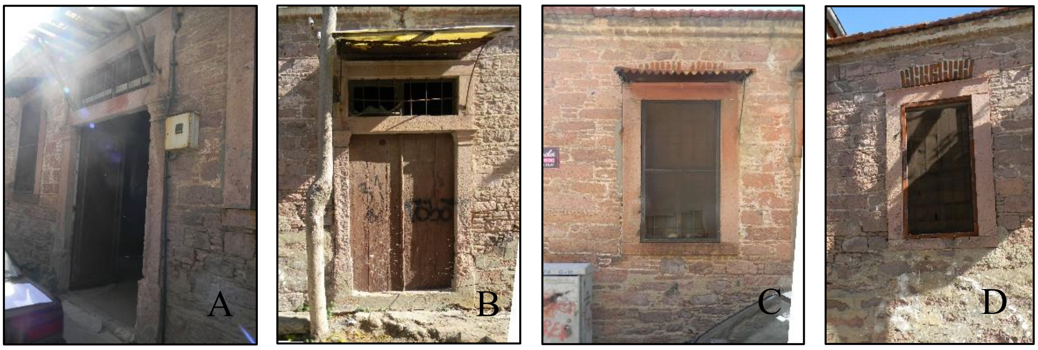


Figure 3.97. Door and Window Types of D08; Image A: Photo of D1, Image B: Photo of D2, Image C: Photo of W1 Type Window, Image D: Photo of W2 Type Window

D08. Although those two types have almost same appearance, they differ in size. The first type W1 have the opening dimensions 160 x 275 cm. (Figure 3.94)

Four windows are in type W1 in this building. In this type sashed double winged timber windows were used except one of them lost its original window frame and closed with a timber plank. Two of the W1 type windows have timber framed insect screens at the outer side of windows. (Figure 3.97,C) The two windows on the façade facing Karantina Street are in W2 type. Those are narrower windows than W1. The width of the openings decreases to 130 cm and the height decreased to 230 cm. Among those two windows, one has timber insect screen at the external part of window. In all types, windows located on the same level from floor which approximately 120 cm. Both types have arched lintel over them which consist of traditional brick and cut stone materials. (Figure 3.97,D)

All windows have iron grills. Another architectural element which differ this building from others is the floor channels which have 40 cm width and the 11-cm depth. On the floor covering there is also a 99 x 67 cm dimensioned concrete vessel which have 17 cm depth inside concrete screed floor finish. Figure 3.98)

Figure 3.98. Architectural Elements on Floor Covering; Image A: Channels on the Floor and Cast Iron Crenels, Image B: Concrete Vessel on Floor Covering.

c. The Story of Building D08 And Its Change

D08 is a large sized depot building which have other depot buildings at inner circle and also in the same block. The construction date of the building is unknown but, the traditional style of its construction and technique is same with other early 20th century buildings. (Terzi, 2007, p. 31) The oldest information about this building, gained from Terzi's thesis written in 2007 and the state of building was again abandoned on this date. According to her study, this building used as a warehouse although, there are some traces like floor channels, iron crenels which can be qualified as production traces. As seen on the photographs taken in 2007 and 2016, (Figure 3.99,B,C) façade

Figure 3.99. Location of D08 and Photographs taken in 2007 & 2016; Image A: Revised Map Showing the Location of D08 (Terzi, 2007), Image B: Photograph of the Façade Facing Karantina Street in 2007 (Terzi, 2007), Image C: Photograph of the Façade Facing Karantina Street in 2016.

facing Karantina Street is not changed. It can be said that; the overall change of building is inconsiderable among those years. Even though at some point in history this building used by some inhabitants, as there are clues like electric connection and florescent lamps, but building has not undergone much change. The alterations and additions are shown in the Figure 3.100 and explained below by numbers.

1. Closing a Window of W1 Type
2. Timber Column and Strut Addition
3. I Beam Addition for Alteration of the Timber Roofing Beam
4. A Metal Lateral Load Bearing Element Addition to Support the Roof
5. Change in Roofing Boards

d. Assessments on The Building D08

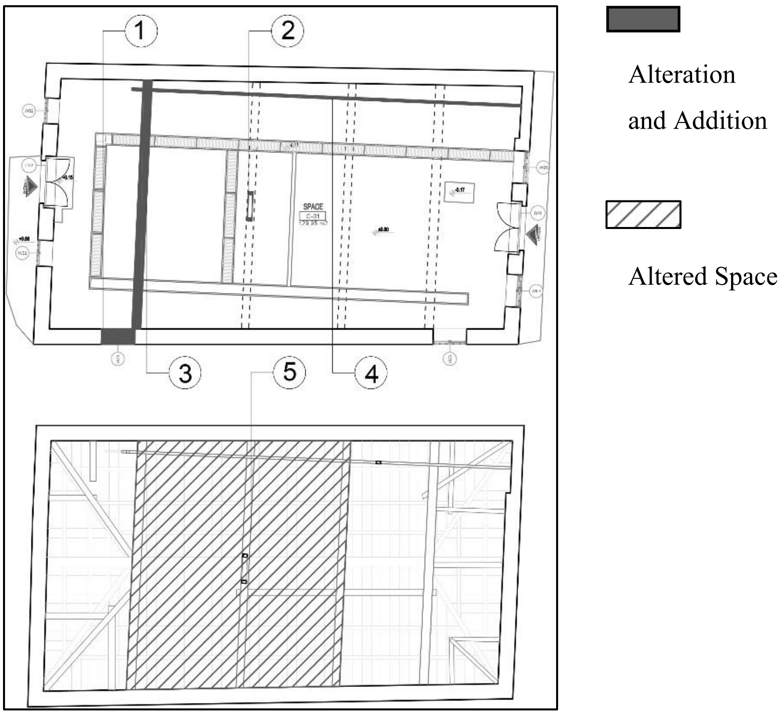


Figure 3.100. Figure Showing a Mapping of Observed Alterations on D08

As mentioned at previous part, this building has some little changes as the time passed through it. It does not have any important structural problem and the alterations done in the past gave less damage to this building different than some other depot buildings.

Some small repairs done as it aged almost 100 years. At present state, the most important and biggest problem this building faced is being abandoned. Some windows are broken, and building is in a neglected and scattered state which bring adverse conditions for the sustainability of building. There are some unqualified alterations on the roofing structure which can changed by some small repairs and alterations. As in other depot buildings, there is no climate insulation which creates problem for future users. Another common problem of those buildings "lightening" is again the problem of D08. At present state, a florescent lamp hanged from the later addition I beam which cannot be considered as a lightening solution.

For making assessments on the building reviewing the potentials of it is a conventionally important part. For this building, one of the most important potential is the mass that it constitutes of. It has approximately 100 m² interior usable area without any obstructions. The height of the building is not too much as it is thought that, spanning that much area needs lower ceiling height. On the other hand, being undergone less change is increasing the authenticity and usability potential of the building. Having that much area can introduce more than one function to building which can be considered as multi-tasking potential of a single-spaced depot building. As it located by the seaside the location is an advantage for having different functions by inhabitants.

As a common traditionally constructed depot building, it has common values of being a part of traditional pattern and symbolising a way of living in the past 100 years. As being the last part of the production line of olive oil, storage buildings stand almost untouched and structurally very healthy condition. The uniformity of the facades and neo-classical elements like stone door profiles and jambs, colonnades among two sides of the doors, arched lintels with brick work above windows and doors are the similar elements, which are elements composing traditional pattern and adding commonness value to all buildings having those architectural elements.

CHAPTER 4

ASSESSMENTS ON PRINCIPLES DRIVEN FROM THE EXPERIENCE OF ADAPTIVE RE-USE WITH MODULAR DESIGN AND SUYVEYED DEPOT BUILDINGS IN AYVALIK

In this chapter, principles will be derived from the studies and reviews done in the previous two chapters. In the following sections, final assessments focused on the experiences obtained from different branches of the research will be made. According to the evaluations on those different determinants; design decisions will be formulated and created among different factors.

In Chapter 3, characteristics and present states of surveyed buildings had been revealed. It is an essential issue to cooperate with the common features of buildings to give decisions on intervention process. The goal in this section is to determine the needs of depot buildings considering their common features and to obtain design parameters. Those parameters will affect the design process applied to buildings to be intervened, with a modular design proposal in Chapter 5.

In section 4.1 acquired advantages with the application of adaptive re-use with a modular perspective will be evaluated. In section 4.2, the studied cases from Turkey and across the World, their approaches and way of implementations are evaluated, and the results will be used as guiding pinpoints of the end proposal.

In addition to this, another important guide for assessments are the studied depot buildings that defined in detail in terms of their planimetric features, construction techniques, finishes, architectural elements, changes, and the existing functions. Thus, the definition of the general and structural frame is expected to define the exact work field and its components by means of above-mentioned aspects. In the same manner, values, problems, and potentials of studied Ayvalık depot buildings are determined with the intention of gaining principles to obtain a minimum intervention method and conserve its values without giving damage to the potentials of buildings.

4.1. Principles Driven from Adaptive Reuse and Modular Design for Conservation of Industrial Heritage Depot Buildings

While some of the Ayvalık depot buildings studied are in use others have been neglected. As stated in many parts of this thesis, all of them have some problems and potentials observed by the site surveys and dialogues made with the inhabitants. Accordingly, some solutions have been provided by those inhabitants which effected building integrity and negatively affected conservation of those buildings. The principle, stated in section 2.1, **"building as a shell structure upon the new insertion"** has selected for turning benefits of the approach into values with using the potentials of Ayvalık depot buildings. With this approach, additionally the benefits of modular design principles can be considered fulfilling the needs of cases without intervening in building integrity.

In that respect, the first principle observed as an advantage/potential by adaptive reuse is conserving heritage buildings with re-functioning or making them available to different uses. Proposing insertions allows solving functional problems which gather mostly around on services about wet spaces, electric, heating, and ventilation. This way commercial and residential uses are expected to allow buildings extend their life spans. For the preparation of adaptive reuse projects, documentation phases of buildings respectively allow buildings eternity with their traditional construction techniques and architectural elements. The second principle comes with the approach is decreasing the intervention level to a minimum degree. With the new insertion, adaptive reuse of the building will be provided which is structured apart from the main structure. The third principle that driven from the approach adaptive reuse of industrial heritage, which handles the subject by proposing a separate insertion, and having no intervention to the façade integrity. This is also a step for conserving the whole industrial pattern of Ayvalık streetscape.

Modular design, which designated as an approach to use in different types of Ayvalık depot buildings has been chosen for the benefits which it offers for the adaptation of buildings to their new functions. The derived advantages expected to be obtained with the application of a modular insertion to building are changing in different scales as design processes to project management control. The first to mention about modular design is standardization it provides as a driven principle. Component standardization upgrades the finished product to a complex level which appears simple, but yet functional. It also is chosen for allowing flexibility of the change in the suggested modular product. Flexibility is one of the important key principles driven from modular design approach. High product variability with additional or neglectable modules is making managing process of reuse project easier. Reducing the economic requirements is another driven principle from the advantages modular design offers. The capital requirement it needs to be compared to custom designs is smaller with the standardization of the applied design.

It should be pointed out that, modular design can bring disadvantages to projects. In that respect, some principles are considered to avoid those disadvantages. The first and most important point is, avoiding “over design” which results with excess cost and inefficiency. Over designing a module or too many common modules may result with the loss of identity of modularity. Another aspect to avoid is to, sacrifice from the performance and function to obtain modularity. Finally making the necessary market for the modular design should be sought. As a principle, working for increasing the validation of this new design to be used in different cases has considered to avoid disappearance of it because of being unknown. In our case, users and stakeholders in Ayvalık needs to be informed about modular design and effects on adaptive reuse of depot buildings with showing them the applied projects to increase the validation of it for other building owners.

4.2. Comparison of Common Features of Surveyed Depot Buildings

In this part, the surveyed buildings' data have been evaluated in order to derive design proposal guidelines. The evaluation has been made within 4 titles. First of all, structural common features and finish materials have been evaluated in detail. In addition to that, architectural features seen in eight surveyed depot buildings have been grouped and the common ones have been evaluated in terms of their physical and material characteristics. Under a third title, observed changes made upon the original depot buildings have grouped and general tendencies are understood by visualizing them in graphics. As the last point, existing function of the depot buildings has grouped and the tendency about the use situations tried to be evaluated for bringing this issue as a design proposal.

4.2.1. Common Planimetric Features and Finishes

As mentioned in the characteristics of surveyed depot buildings; first, all the single-spaced one-storeyed stone masonry buildings are with timber roof and with one or two entrances. With respect to this, their planimetric features are showing similarities.

Initially; all plans are in quadrilateral shape. Out of eight buildings, six of them have two longitudinal and two shorter facades which compose a rectangle alike shape from

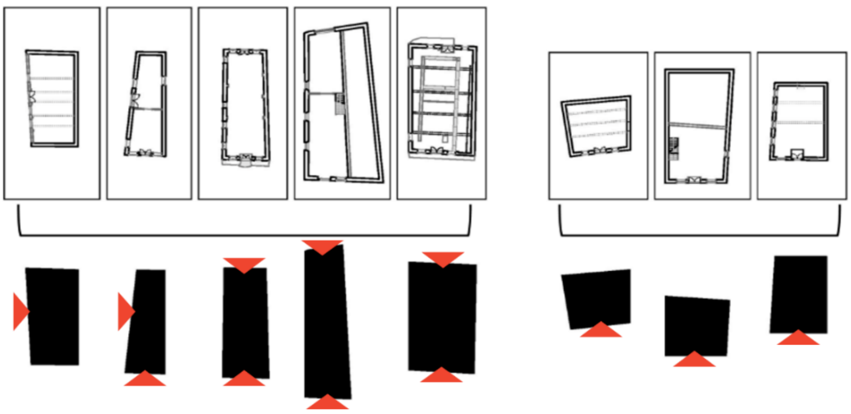


Figure 4.1. Figure Showing Planimetric Analysis of Surveyed Depot Buildings

outside. The other two buildings have a squarer shape in planimetric analysis with four substantially close dimensions. In addition to this, out of 8 surveyed buildings four of them have double entrances. However, the mostly seen double entranced buildings have their entrances on both short sides opened to two different streets, one of them has two entrances on both longitudinal and shorter side of the building. Among other four buildings having single entrance, one building has its entrance located on longitudinal façade. (See: Figure 4.1)

For all eight buildings surveyed; a table is prepared for different common aspects of them. The structural formation of those buildings has started from the vertical elements primarily like most of the buildings (Table 4.1). Walls are evaluated firstly for being load-bearing or partition wall to group their characteristics as types of walls. The number of walls has inserted in the table as entries to follow up their characteristics After then, their construction technique and materials are segmented. As a result; number of the common elements which form those vertical elements of depot buildings can be seen. Among eight buildings; load bearing walls of seven of them are constructed with rubble stone and lime mortar. In one of them; D01, a mixed masonry technique is used with rubble stone and traditional brick with lime mortar mixture. In one building; D04, 3 different construction techniques can be seen and in one of the load-bearing walls, traditional brick is used. Wall thicknesses among stone load bearing walls change in 45-55 cm range. Only in one building, a traditional brick masonry wall is seen as load bearing and its thickness is 30 cm. In seven of eight buildings corner stone as construction element is observed at the outer façade of.

Among eight surveyed buildings, five of them have tension bars that can be observed from their outer facades. Those iron reinforcement elements are common features among depot buildings, and they are a part of the traditional street pattern. A common issue among plastered depot buildings is material loss on plastered surfaces of load bearing walls. As stated in Table 1. 3 of surveyed buildings are having this observable problem.

Partition walls are not the original features of buildings, but they are planimetric features of seven buildings. A repetitive pattern is not observed in the use of partition walls, but some similarities are present. Most of the partition walls are made with timber. Four of the seven buildings have timber partition elements but, neither technical nor figuratively they are in the same language (Table 4.1). Other materials used as forming partition walls are concrete, hollow and traditional brick, and gypsum panel. Some of the partition walls are fully plastered so, their materials couldn't be identified. Although some of them create closed spaces like wet spaces, some of them create semi open spaces and still others are only used as space dividers with their low heights. Their thicknesses vary according to the material used from 8 cm to 40cm but most of them are 10-20 cm band. Timber frame partition walls have thicknesses varying among 8 cm to 14 cm. Brick masonry partition walls are seen as hollow brick masonry and as traditional brick masonry in two cases and their thicknesses are 22 cm and 15 cm. In one depot building, concrete is used as partition material. Its thickness changes between 10-12 cm because of the workmanship. In one building, a partition wall made with gypsum panels is present, but, because of the high level of it and lack of vertical circulation in building, the thickness of it couldn't be measured. In four depot buildings; plastered partition walls obstruct the material observation but, the thicknesses of them vary between 10 cm to 40 cm. Same with vertical construction elements; horizontal elements like floor slabs and mezzanine floors have some similarities (Table 4.2).

Table 4.2. Common Elements in Construction Techniques and Materials; Vertical Elements, Walls

CONSTRUCTION TECHNIQUES AND MATERIALS

VERTICAL ELEMENTS / WALLS

BUILDINGS			D01						D02						D03						D04						D05						D06						D07						D08						TOTAL
SPATIAL DIMENSIONS	LOT AREA OF BUILDING		77.2 m^2						74.6 m^2						90.1 m^2						99.2 m^2						137 m^2						78 m^2						100 m^2						155 m^2						
SPATIAL DIMENSIONS	INTERIOR AREA OF THE BUILDING		57.4 m^2						58.3 m^2						73.5 m^2						81.6 m^2						108.7 m^2						62.5 m^2						81.7 m^2						129 m^2						
SPATIAL DIMENSIONS	MEZZANINE FLOOR AREA OF THE BUILDING																				17.3 m^2						43.5 m^2						49.2 m^2						14.8 m^2												
ELEVATIONAL DIMENSIONS	APPROXIMATE TOTAL HEIGHT OF THE BUILDING		4.86 m						5.80 m						4.26 m						6.35 m						6.31 m						7.26 m						⊗						7.63 m						
ELEVATIONAL DIMENSIONS	CEILING HEIGHT OF THE BUILDING		3.63 m						4.29 m						3.75 m						4.63 m						3.65 m						4.76 m						4.93 m						3.56 m						
ELEVATIONAL DIMENSIONS	CEILING HEIGHT OF THE MEZZANINE FLOOR																				2.07 m						2.80 m						2.62 m						2.80- 3.20 m												
WALL TYPE			LOAD-BEARING WALL			PARTITION WALL			LOAD-BEARING WALL			PARTITION WALL			LOAD-BEARING WALL			PARTITION WALL			LOAD-BEARING WALL			PARTITION WALL			LOAD-BEARING WALL			PARTITION WALL			LOAD-BEARING WALL			PARTITION WALL			LOAD-BEARING WALL			PARTITION WALL			LOAD-BEARING WALL			PARTITION WALL			
# OF WALLS			1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
WALL THICKNESS			45 cm			15-20 cm			50 cm			22 cm	30-40 cm		45 cm			10-12 cm			43 cm	43 cm	30 cm	10 cm	15 cm		55 cm			55 cm	10- 14 cm		50 cm			10 cm			53 cm			6-8 cm	10-12 cm	12 cm	52 cm						
MASONRY	STONE	RUBBLE STONE WITH LIME MORTAR							●						●						●						●						●						⊗						●						7/8
MASONRY	STONE	RUBBLE STONE AND TRADITIONAL BRICK MIXED MASONRY WITH LIME MORTAR	●																			●																														2/8
MASONRY	BRICK	TRADITIONAL BRICK																					●		●																											2/8
MASONRY	BRICK	HOLLOW BRICK										●																																								1/8
MASONRY	EXISTANCE OF CORNER STONE		●												●								●				●						●						●						●						7/8
MASONRY	EXISTANCE OF TORSION BAR		●						●														●										●												●						5/8
MASONRY	PLASTERED & UNIDENTIFIED								●																																												1/8
MASONRY	PLASTERED but HAVING MATERIAL LOSS								●						●								●																														3/8
SKELETAL SYSTEM	TIMBER FRAME	BAĞDADI																												●																							1/8
SKELETAL SYSTEM	TIMBER FRAME	PANEL WITH TIMBER WINDOW PROFILE																●						●							●												●										4/8
SKELETAL SYSTEM	CONRETE FRAME	HOLLOW BRICK INFILL																																										●									1/8
SKELETAL SYSTEM	CONRETE FRAME	UNIDENTIFIED																																																			0/8
SKELETAL SYSTEM	STEEL	GYPSUM PANEL INFILL																																											●								1/8
SKELETAL SYSTEM	PLASTERED & UNIDENTIFIED					●							●																							●																	3/8

Table 4.2. Common Elements in Construction Techniques and Materials; Horizontal Elements, Mezzanine Structure and Floor Finishings

CONSTRUCTION TECHNIQUES AND MATERIALS HORIZONTAL ELEMENTS / MEZZANINE STRUCTURE & FLOOR FINISHINGS		D01	D02	D03	D04	D05	D06	D07	D08	TOTAL
SPATIAL DIMENSIONS	LOT AREA OF BUILDING	77.2 m^2	74.6 m^2	90.1 m^2	99.2 m^2	137 m^2	78 m^2	100 m^2	155 m^2	
	INTERIOR AREA OF THE BUILDING	57.4 m^2	58.3 m^2	73.5 m^2	81.6 m^2	108.7 m^2	62.5 m^2	81.7 m^2	129 m^2	
	MEZZANINE FLOOR AREA OF THE BUILDING				17.3 m^2	43.5 m^2	49.2 m^2	14.8 m^2		
ELEVATIONAL DIMENSIONS	APPROXIMATE TOTAL HEIGHT OF THE BUILDING	4.86 m	5.80 m	4.26 m	6.35 m	6.31 m	7.26 m	⊗	7.63 m	
	CEILING HEIGHT OF THE BUILDING	3.63 m	4.29 m	3.75 m	4.63 m	3.65 m	4.76 m	4.93 m	3.56 m	
	CEILING HEIGHT OF THE MEZZANINE FLOOR				2.07 m	2.80 m	2.62 m	2.80- 3.20 m		
FINISHING OF GROUND FLOOR	CONCRETE SCREED		●	●	●	●	●	●	●	7/8
	TERRAZZO CERAMIC TILE	●								1/8
	EXISTANCE OF METAL GRILL								●	1/8
	VYNIL FLOOR COVERING							●		1/8
MEZZANINE SLAB THICKNESS					20 cm	12-20 cm	10 cm	10 cm		
SKELETAL SYSTEM	CONCRETE				●			●		2/8
	TIMBER FRAME					●				1/8
	STEEL FRAME						●			1/8
FINISHING OF MEZZANINE FLOOR	CONCRETE SCREED				●			●		2/8
	TIMBER FLOOR COVERING					●	●			2/8
	VYNIL FLOOR COVERING						●			1/8

●	existing
⊗	known but not observable

First of all; seven out of eight buildings have concrete screed as ground floor finishing which can be accepted as common construction element among depots. Opposed to this situation, in one building, terrazzo ceramic tile is seen which cannot be identified as a common element. Finishes generally do not have elevation differences or steps on ground floor level. Among 8 buildings; as a rare finish element, iron grill is observed upon channels inside concrete screed finish. Another horizontal architectural element, mezzanine structures inside depot buildings are generally composed of skeletal system. The materials used for constructing those skeletons are concrete, timber and steel.

Table 4.3. Common Elements in Construction Techniques and Materials; Horizontal Elements, Roofing Structure and Ceiling Finishings

CONSTRUCTION TECHNIQUES AND MATERIALS HORIZONTAL ELEMENTS / ROOFING STRUCTURE AND CEILING FINISHINGS		D01	D02	D03	D04	D05	D06	D07	D08	TOTAL
SPATIAL DIMENSIONS	LOT AREA OF BUILDING	77.2 m^2	74.6 m^2	90.1 m^2	99.2 m^2	137 m^2	78 m^2	100 m^2	155 m^2	
	INTERIOR AREA OF THE BUILDING	57.4 m^2	58.3 m^2	73.5 m^2	81.6 m^2	108.7 m^2	62.5 m^2	81.7 m^2	129 m^2	
	MEZZANINE FLOOR AREA OF THE BUILDING				17.3 m^2	43.5 m^2	49.2 m^2	14.8 m^2		
ELEVATIONAL DIMENSIONS	APPROXIMATE TOTAL HEIGHT OF THE BUILDING	4.86 m	5.80 m	4.26 m	6.35 m	6.31 m	7.26 m	⊗	7.63 m	
	CEILING HEIGHT OF THE BUILDING	3.63 m	4.29 m	3.75 m	4.63 m	3.65 m	4.76 m	4.93 m	3.56 m	
	CEILING HEIGHT OF THE MEZZANINE FLOOR				2.07 m	2.80 m	2.62 m	2.80- 3.20 m		
HIPPED ROOF	# OF TRUSSES			⊗	5	9	3	⊗	4	6/8
	THICKNESS OF BEAMS			30 cm	20 cm	23-25 cm	25 cm	⊗	25 cm	
	# OF SURFACES			4	4	4	4	4	4	
GABLED ROOF	# OF TRUSSES	6	3							2/8
	THICKNESS OF BEAMS	25 cm	20 cm							
	# OF SURFACES	3	2							
EXISTANCE OF PEDIMENT			●							1/8
EXISTANCE OF GUTTER			●	●					●	3/8
EXISTANCE OF SKYLIGHT					●		●			2/8
EAVE	STONE					⊗	●	⊗		1/8
	BRICK	●	●		●	⊗		⊗	●	4/8
	TIMBER			●						1/8
TYPE OF ROOF TILE	OVER & UNDER TRAD. ROOF TILE	●				●	●	●		4/8
	MARSEILLE TYPE INTERLOCKING ROOF		●	●	●				●	4/8
CEILING FINISHES	TIMBER LATHS	●		●		●				3/8
	OSB PANELS						●			1/8
	PAINT ON CONCRETE CEILING				●			●		2/8

●	existing
⊗	known but not observable

Among eight studied depot buildings, four of them have mezzanine structure. Slab thicknesses are change between 10-20 cm range with respect to material change among structures (Table 4.3.). In none of the studied buildings, an original mezzanine floor structure can be seen. From traces on walls like holes for timber elements as joint detail with stone masonry and original stone bracings it can be understood that there was an original mezzanine structure beforehand. Apart from the different construction materials, finishes on mezzanine slabs also don't have similar characteristics. They are changing according to the user preferences. Finishing materials on mezzanine floors are; concrete screed, timber floor covering and vinyl floor covering.

Common elements in roofing structure and ceiling finishes is shown in Table 4 4. The roof structure has more variety of elements from any other structure of depot buildings. With its façade appearance elements and variety of structural elements, roofing structure have commonness's among depot buildings which spread through the historic industrial zone of Ayvalık. Hipped and gabled roof types are seen with 2,3 or 4 surfaces (Table 4 4). Hipped roofs have 4 surfaces and six buildings from eight studied buildings have 4 surfaced hipped roofs. In gabled roofs one building has 2, the other one has 3 surfaces. The number of trusses varied in accordance with the size of the building and the total length. As it can be seen in Table 4.3 depot building D05 has nine trusses because of its huge size and approximately 20 mt. length. Among surveyed buildings, the smaller number of trusses is three. Timber beams, which transfer the load of the roof to load bearing walls have 20-30 cm thicknesses.

Pediments are the most common elements of Ayvalık streets with their rich architectural quality. Among the buildings studied, only one depot building possessed a pediment on its front façade, D02. Other façade elements of those buildings related with roofing structure are, eaves and gutters. The use of gutter is not a common element for original traditional depot buildings. As a survey result, 3 of the buildings having observable gutter at front façade are later additions to building, probably because of the water leakage problem of the roof structures. The other common element in all of depot buildings are eaves. Generally, depot buildings don't have projections, but some small edges representing eaves as common elements. Those edges are composed of stone and brick materials and lime stone bonding which seems like continuation of the load bearing wall. Only in one building, a projected timber eave is seen is a later addition to the building. Contrary; 4 buildings have brick, and 1 building has stone material used to compose an eave. Buildings coded D05 and D07 couldn’t be observed because of visual obstacles, but it is known that those buildings also have brick or stone eaves on their roofing structures. When we come to the top layer of the roofing structure, roof tiles show some similarities within themselves. The original traditional over and under roof tiles are seen on the half of the buildings and the other half possessed Marseille type interlocking rooftiles.

Ceilings of the depot buildings are also grouped under horizontal common elements. The most common material used are timber laths. Other ceiling finishes are the finishes of later additions to the buildings.

4.2.2. Architectural Features

In this part of the thesis, architectural features of the buildings will be discussed. As in the table Table 4.4 indicated there are three groups of architectural features. The first group is windows, which gave strong characteristics to depot buildings. They are examined according to their structures, architectural properties and materials. First, types of windows are examined building by building and it is found that in one building at most 3 types of windows exist. The changes in dimensions across buildings seen in Table 4.4; the opening dimension for windows are slightly varied in each building. There are three diffraction points among widths of windows. The smallest width seen are 80- 82 and 100 cm. Therewithal, a range of dimensions from 115 to 140 can be identified as the mostly seen width among the depot buildings. The last range for windows changes between 145 cm to 160 cm. Although, widths varied much, heights of the openings are generally on 200-235 cm band. Their height from the interior floor levels are changing from building to building and also it is affected by the total height of the building. However, a pattern can be interpreted by them which has a range of 75-90 cm and 100- 125 cm. The highest height from floor level is seen in D01, window type W3, which is the most changed or lately added window of the building.

One of the most characteristic property of Ayvalık depot buildings are arched lintel seen from outside the building. They are the existing elements which give the industrial and neo-classical character to the landscape. Among fifteen types of windows on eight different buildings twelve have an arched lento which is visible from the outer façade. The material use on those arches are stone and brick. As seen in Table 4.4, five of eight building have stone arches on windows and in the rest three, brick is the used material.

The second architectural feature are the doors. Mostly longitudinal buildings have two doors located on the narrow and wide façades. The minimum opening height is 300 cm and the maximum 370cm. This provides a spacious and ceremonious entrance for those mostly single-spaced buildings. All doors are two sashed and width of the doors are changing between 165 cm and 225 cm. Across the twelve doors examined, nine of them have arched lento above the opening. The material use for those structural elements are either stone or brick alike the rest of the building. In five building their material observed as stone and in three of them brick use has seen. In six of eight depot buildings on top of stone colonnades, on both sides of the opening, a carved stone profile is present. Those elements provide aesthetical and architectural characteristics to building and to the city scape.

The last architectural features examined are the staircases. As mentioned in the part 4.2.1, across the surveyed, four buildings have mezzanine floors and three of them have different kinds of staircases. None of them are original staircases of the existing buildings. The materials used for those staircases are timber and steel. Their general properties can be distinguished on the Table 4.4.

Table 4-5 Common Elements; Architectural Features of Surveyed Depot Buildings

ARCHITECTURAL FEATURES

BUILDINGS	D01			D02			D03			D04			D05			D06			D07			D08			TOTAL
WINDOWS	W1	W2	W3	W1	W2	W3	W1	W2	W3	W1	W2	W3	W1	W2	W3	W1	W2	W3	W1	W2	W3	W1	W2	W3	
OPENING DIMENSIONS (inside) (cm)	150/255	140/240	122/200	80/225			115/250	105/250	145/133	130/225	130/225		105/235	130/235		145/222			82/185			160/275	130/230		
HEIGHT FROM FLOOR LEVEL	96 cm	90 cm	132 cm	100 cm			75 cm	75 cm	175 cm	110 cm	110 cm		90 cm	120 cm		95 cm			125 cm			120 cm	120 cm		
EXPOSED ARCHED LENTO FROM OUTSIDE		●	●	●			●			●	●		●	●		●			●			●	●		
EXPOSED ARCHED LENTO FROM INSIDE	●	●	●	●			●	●	●	●	●		●	●					●			●	●		
ARCHED LENTO MATERIAL: STONE		●			●			●			●												●		5/8
ARCHED LENTO MATERIAL: BRICK														●			●			●					3/8

DOORS	D01 D1	D01 D2	D02 D1	D02 D2	D03 D1	D03 D2	D04 D1	D04 D2	D05 D1	D05 D2	D06 D1	D06 D2	D07 D1	D07 D2	D08 D1	D08 D2	TOTAL
OPENING DIMENSIONS (inside) (cm)	200/370	225/355	165/317		186/377		180/330		238/302	210/300	165/315		170/310	160/315	180/360	175/340	
EXPOSED ARCHED LENTO FROM OUTSIDE		●	●		⊗		●			●	●		●	●	●	●	
EXPOSED ARCHED LENTO FROM INSIDE	●	●	●		●		●			●			●	●	●	●	
EXISTANCE OF STONE PROFILE ON COLLONADES	●		●		●				●		●				●		6/8
ARCHED LENTO MATERIAL: STONE									●		●		●				3/8
ARCHED LENTO MATERIAL: BRICK	●		●		●		●								●		5/8

	D01	D02	D03	D04	D05	D06	D07	D08	TOTAL
STAIRCASE					●	●	●		3/8
MATERIAL: TIMBER					●		●		2/3
MATERIAL: STEEL						●			1/3
RISER					28 cm	15.6 cm	⊗		
TREAD					31 cm	30 cm	25 cm		
TOTAL RISE					280 cm	260 cm	⊗		
TOTAL RUN					310 cm	340 cm	124.5 cm		
# OF STEPS					10	12	5		
HEIGHT OF HANDRAIL					95 cm	90 cm			

●	existing
⊗	known but not observable

4.2.3. Change

In part 3.1 Characteristics of Surveyed Depot Buildings, one by one, changes that can be observed from the existing state of buildings have stated. According to those observations, changes have grouped into seven categories and in Table 4.6. they are indicated as; wall changes, flooring changes, roofing changes, changes on architectural elements, spatial changes, known functional changes and lot changes according to the location of the change happened. Looking through those statistics acquired from the survey of 8 depot buildings in Table 4 7 a pie chart prepared to see the distribution of those changes. In that respect it is found out that the most commonly seen change is the spatial change obtained by the addition of a smaller space into building. In 7 of 8 buildings surveyed, this type of change has seen which can be accepted as it is a rapid change. The need for dividing big space into small spaces also can be seen as 19% wall change in the pie chart.

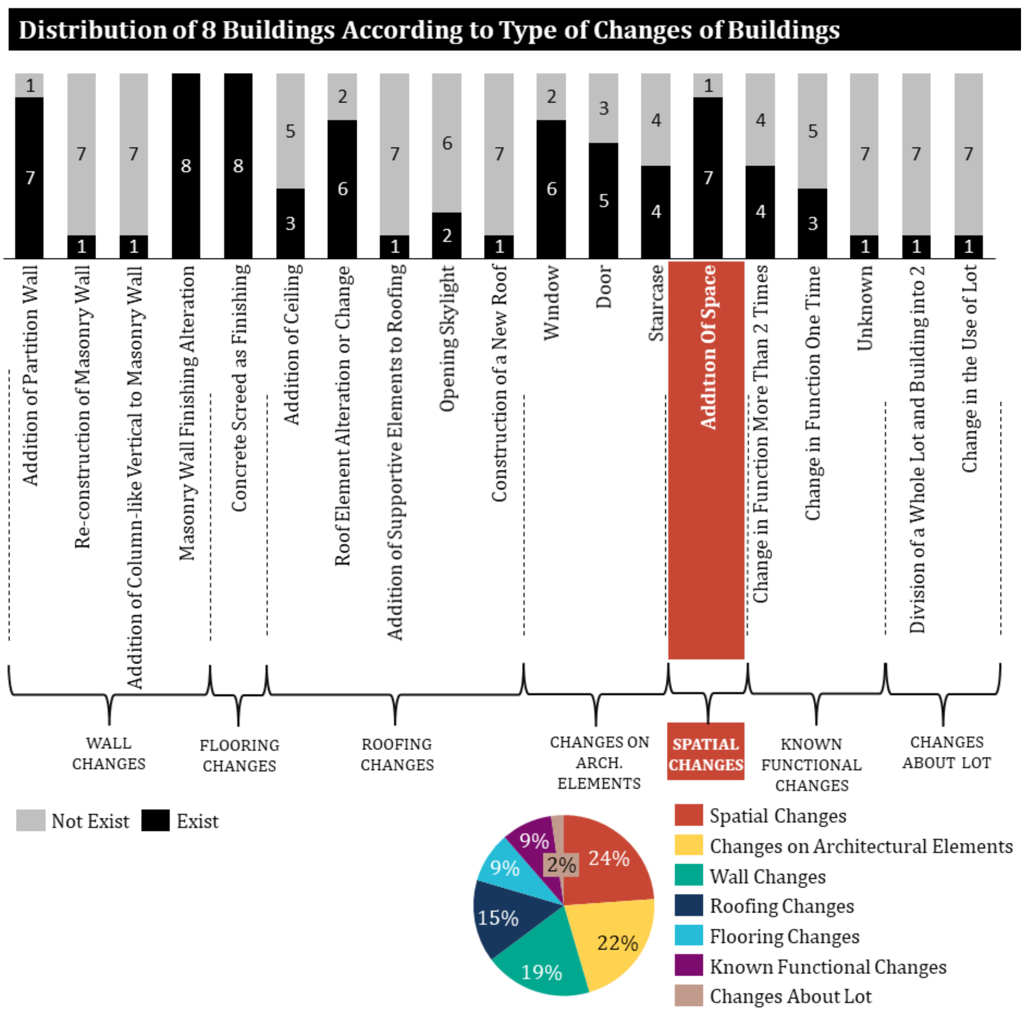
When examined in detail, the addition of a partition wall into the depot building is seen in seven buildings. This assessment brought by this statistic is one of the causes of a modular insertion proposal to depot buildings. In addition to that, the second rapid change seen in Ayvalık depot buildings is the changes upon architectural elements which is a situation not desired and acceptable for those historic buildings. The most change occurred on the windows in 6 buildings out of 8 and in turn, doors are following this number with 5 buildings.

Table 4.5. Changes Seen in 8 Surveyed Depot Building

CHANGES											
BUILDINGS			D01	D02	D03	D04	D05	D06	D07	D08	TOTAL
WALL CHANGES		Addition of Partition Wall	●	●	●	●	●	●	●		7/8
		Re-construction of Masonry Wall				●					1/8
		Addition of Column-like Vertical Elements to Masonry Wall							●		1/8
		Masonry Wall Finishing Alteration (White Washing or Plaster)	●	●	●	●	●	●	●	●	8/8
FLOORING CHANGES		Concrete Screed as Finishing	●	●	●	●	●	●	●	●	8/8
ROOFING CHANGES		Addition of Ceiling	●		●		●				3/8
		Roof Element Alteration or Change		●	●	●		●	●	●	6/8
		Addition of Supportive Elements to Roofing								●	1/8
		Opening Skylight				●		●			2/8
		Construction of a New Roof			●						1/8
CHANGES ON ARCHITECTURAL ELEMENTS	WINDOW	Addition of New Window Opening		●		●					2/8
		Change in the Proportion of Opening	●								1/8
		Closing the Window Opening			●					●	2/8
		Color Change of Window Frame	●	●							2/8
		Change of Window to Door	●								1/8
		Color Change on Window Glass							●		1/8
	DOOR	Change in the Proportion of Opening				●	●				2/8
		Closing the Transom Window Over Door			●			●			2/8
		Addition of New Door Opening		●							1/8
		Closing the Door Opening		●							1/8
	STAIRCASE	Addition of Staircase					●	●	●		3/8
		Removed Staircase			●						1/8
SPATIAL CHANGES	ADDITION OF SPACE	Wet Space Addition	●	●		●	●	●	●		6/8
		Office Space Addition		●		●		●	●		4/8
		Addition of Semi-Open Space			●	●			●		3/8
		Space Addition With Mezzanine Floor Addition				●	●	●	●		4/8
		Change in the Original Mezzanine Floor					●				1/8
		Space Division With Partition Wall	●				●		●		3/8
KNOWN FUNCTIONAL CHANGES		Change in Function More Than 2 Times	●		●	●		●			4/8
		Change in Function One Time		●			●		●		3/8
		Unknown								●	1/8
CHANGES ABOUT LOT		Division of a Whole Lot and Building into 2					●				1/8
		Change in the Use of Lot (Interruption of the Link of Building with Open Space)			●						1/8

With 15%, changes in roofing structure are seen as the following change type after the changes made upon walls. Inhabitants have made changes upon roofing elements by making some alterations on the existing elements or by totally changing the problematic ones. Because of its effect on the ambiance of the building, opening skylight is an extreme change for those structures and 2 out of 8 surveyed buildings, this change was observed which can be considered relatively high proportion. As mentioned in part 3.1 Characteristics of Surveyed Depot Buildings, it is known that, some parts or full of the flooring of depot buildings are covered with earth at early

Table 4.6. Table Showing Observed Changes in Eight Surveyed Depot Building.



timed. Bearing these facts in mind, in none of the buildings, original flooring could be observed so all of them accepted as changed.

Known functional changes of the buildings are also evaluated under the title of change. From the eight surveyed buildings, it has examined that; four of them have changed their functions more them two times. Three of them have changed their functions one time and one of them is not in use at present state so, no information could reach for this building. As can be seen, the need for flexibility in use for different kinds of functions is a need for those historic buildings. By only insertion of the basic needs for inhabitants, sustainability of those buildings can be provided.

At last, the least amount of change has observed from the surveyed depot buildings is change in the lot. As most of the depot buildings are covering the whole lot and they are single-spaced buildings, this is not a commonly seen change. On the other hand, in one of the buildings, division of one big lot has observed, and the building located on top of a massive lot is divided into two with a later addition of a permanent wall.

4.2.4. Existing Functions

Existing functions of those 8 surveyed buildings have grouped under this title to observe the present tendency about use function and deriving information for drawing a path in terms of proposing additional functions to them. According to the observations and dialogues made with inhabitants of buildings, the map shown in Figure 4 2 has elaborated. As can be seen; six surveyed depot buildings among eight have commercial functions and the rest two of them were not in use when site survey for this thesis made. Only in one of the dialogues made with inhabitants of D05, it was learned that they lived at the mezzanine floor of the depot some time ago, for a short period of time which can be counted as residential use.

The two buildings D01 and D04 were grouped under café- restaurant commercial use. Gastronomic functions are popular in terms of the use of industrial buildings according to the general observations made during site surveys. Some coffee shops, night clubs and restaurants of local foods have seen under this type of buildings.

Together with gastronomical uses, art workshops and ateliers also with glass and woodworking ateliers in traditional and modern means have seen as functions of depot buildings. Buildings D02 and D04 are woodworking ateliers which D02 is working mostly on traditional woodworking which covers window frames, ceiling laths, etc. On the other hand, in D04 mostly more modern designer pieces were prepared for interior and exterior of traditional and modern buildings of Ayvalık.

Another commercial use of depot buildings is mostly popular in the street which D05 located is antique shops. On that street, one after the other buildings is used as antique shops that sell different kinds of glassware, old ceramic, or porcelain coffee cups and old music hardware.

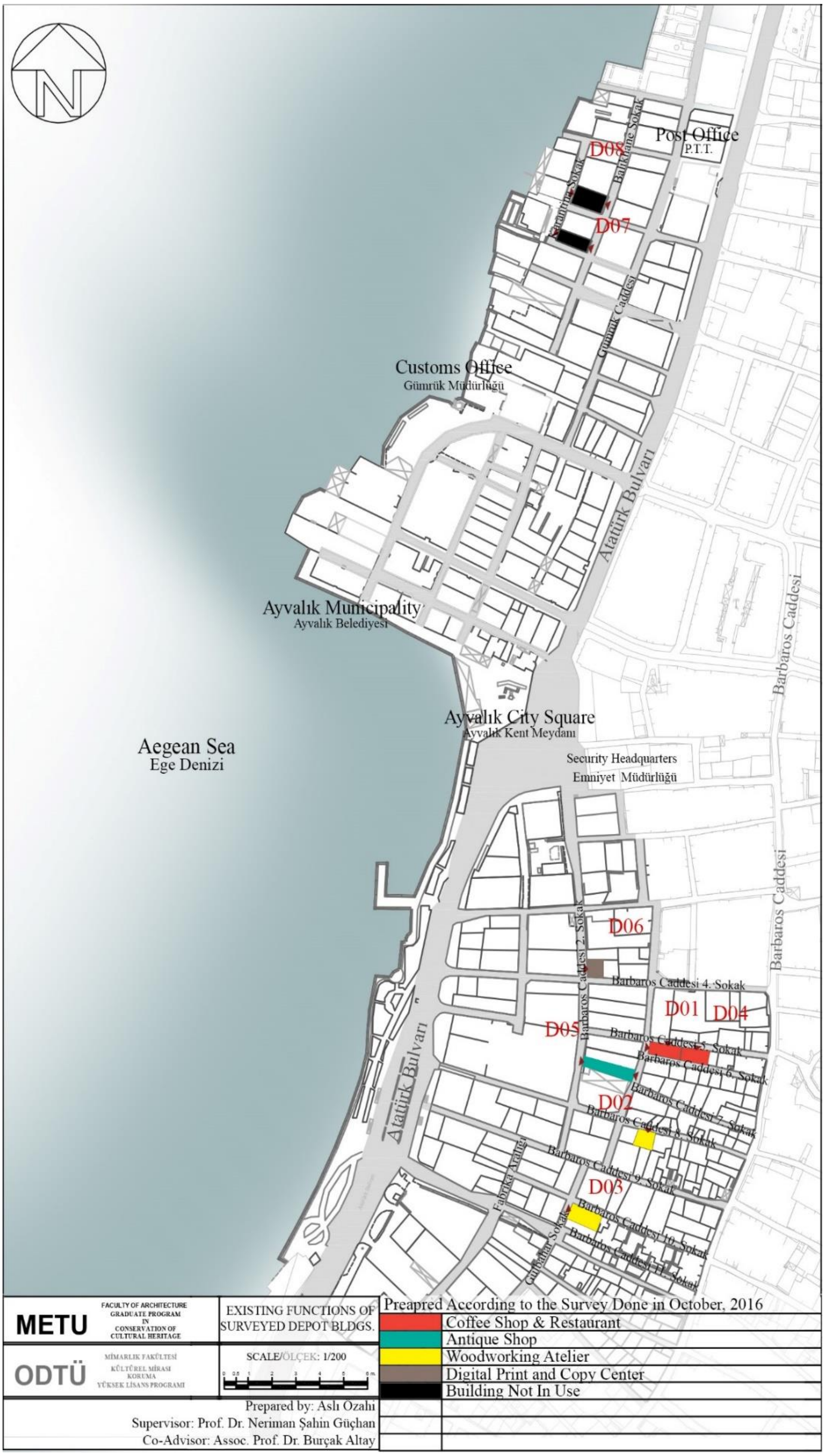


Figure 4.2. Map Showing Existing Functions of the Surveyed Depot Buildings

4.3. Evaluation of Buildings

In this section of Chapter 4, depot buildings will be re-evaluated by means of their general characteristics with the help of collected information. The assessments made with the light of the one by one examination and data collection of the 8 surveyed depot buildings will be combined in this section which will generate a base for the proposal of the insertion. The strategy defined as “building as a shell structure upon the new insertion” will be supported by those assessments.

In a detailed examination of surveyed depot buildings, examined values, problems and potentials for each building has defined. Regarding that information, combined with the historical background of buildings and changes that they undergone below, obtained assessments will be evaluated.

4.3.1. Value

According to the already made assessments about each studied depot buildings, being a part of the whole industrial landscape is the most important and frequent value, with their architectural and structural characteristics. They are representing the industrialization period and the age value of Ayvalık and consolidate the industrial cityscape with their own components. In addition to that, Ayvalık depot buildings have traditional façade organizations with limited or any change. With the traditional olive oil factories and traditional residential buildings, depot buildings are one of the branches which adds more to the authenticity of the whole city. Because of this reason; they have a value with being authentic, with their non-changed façade elements. Among studied 8 buildings in the scope of this thesis, six of them have to continue their lifespan with their original components. Besides, the other two depot buildings have some changes on their facades, they demonstrate the date that changes had done which are also compatible with the pattern of the Ayvalık cityscape. This situation adds on the value of change for those buildings and they are representing both eras. Interior alterations which are past changes buildings had undergone also can be

Table 4.7. Table Derived from the Evaluation of the Values of Ayvalık Depot Buildings

VALUES											
BUILDINGS		D01	D02	D03	D04	D05	D06	D07	D08	TOTAL
AGE VALUE	Being a Part of the Industrial Era of Ayvalık from the late 19th Century	●	●	●	●	●	●	●	●	8/8
CHANGE VALUE	Change Value Which Gained with Compatible Past Alterations			●	●	●				3/8
AUTHENTICITY VALUE	Having Original Traditional Facade Elements without any Architectural Change	●	●	●			●	●	●	6/8
VALUE OF UNIQUENESS	Having a Rare Architectural Element		●		●	●				3/8

classified as value of change. In this classification about change, the specified In this classification about change, the specified valued does not cover the lost architectural values of those buildings, as original floorings or, lost mezzanine floors. If there are traces, they are valuable for the building itself.

Authenticity is a complex issue because of the definition of this term can change in different cases. The defined authenticity for this thesis can be specified as; having original traditional façade elements without ant architectural change. The way architectural elements of depot buildings affecting industrial cityscape is higher when all traditional architectural elements on façade are original and exposed. So, they are specified as more authentic in the scope of this thesis and 6 of studied depot buildings have all traditional elements on their façade organization. In addition to this, some more authentic buildings which have unique elements on their facades as ornamentations and rare architectural features are specified under the title of uniqueness value. In that manner, throughout the industrial pattern, those rare buildings are catching eyes with their uniqueness and they seem more valuable for locals, investors and also for inhabitants.

4.3.2. Problem

Evaluation of the problems has classified under four inclusive titles. Those are; structural problems, problems arise with inflexible additions and alterations, disruption of façade unity and at last spatial problems. That information about problems of buildings gathered at the field study with site observations on studied eight depot buildings and the dialogues made with inhabitants.

The first title which encompasses structural problems is mostly observed with the dampness problem traces inside and outside of buildings. Those traces have specified from Chapter 3 with the building by building detailed information. As seen in Table 4 9 the most problematic dampness problem has seen on roofing elements. In 7 of 8 studied buildings, dampness on roofing elements observed. Following it, dampness observed on stone masonry walls is one of the major problems about dampness. At that point, because of this deficiency about dampness, mortar loss inside and outside the building has seen on 7 buildings out of 8. This also has affected by the lack of gutter on roofs of buildings and mortar loss on facades of depot buildings was observed. Structural problems cannot be specified as the most problematic parts of studied Ayvalık depot buildings. Indeed, according to Table 4 10 which shows the distribution of 8 studied buildings according to the type of problems, most common problem of those buildings are spatial problems. This is also a supporting fact mentioned in previous sections that, Ayvalık depot buildings are structurally in a healthy condition. This also supports the idea of using buildings as shell structures upon the new insertions.

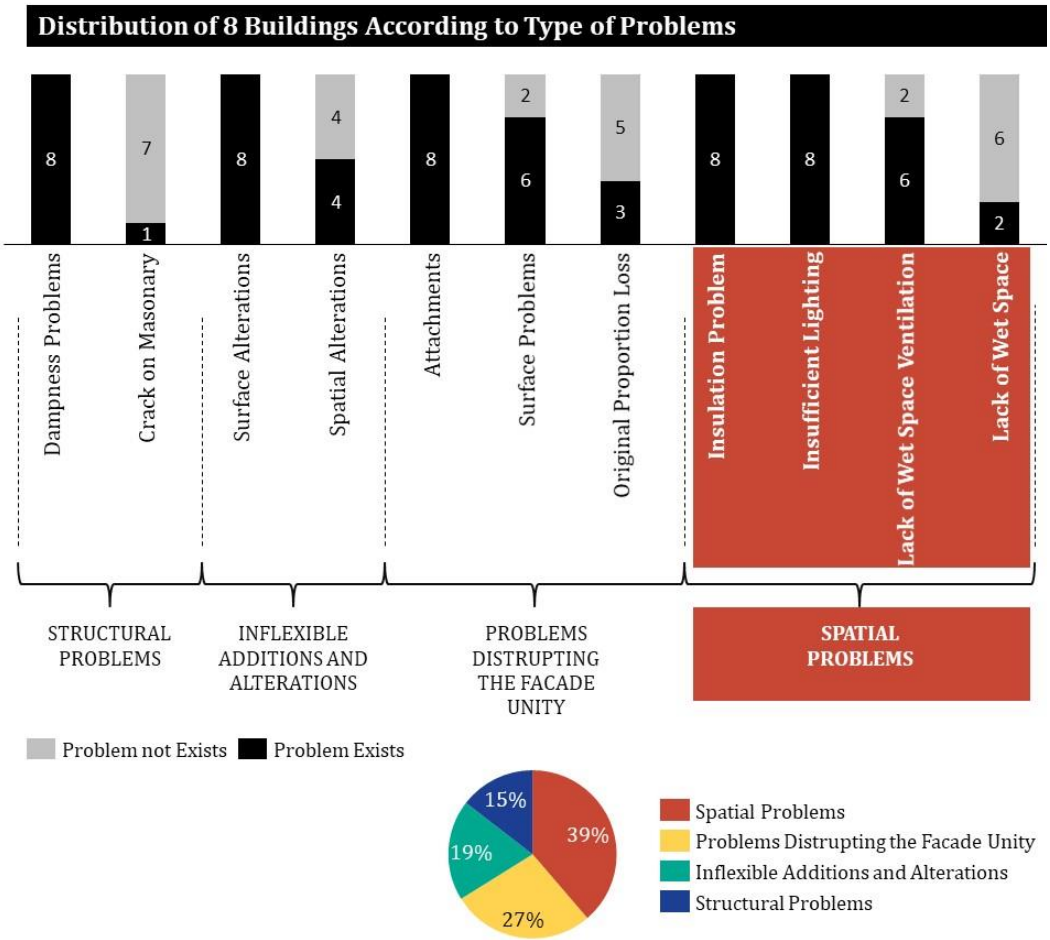
Based on the statistics about the distribution of the problems, spatial problems which include lack of wet space, and the services attached with those functions have seen as missing in most buildings. At the same time, buildings which shelter wet space functions, neither have sufficient space for this function nor have sufficient services as ventilation, lighting and water-resistant insulation. Those symptoms affecting usability of depot buildings led and also support the idea of upgrading indoor use for different functions and user profiles. With this, principles driven from the detected discrepancies. Space related different problems of Ayvalık depot buildings are

Table 4.8. Table Derived from the Evaluation of the Problems of Ayvalık Depot Buildings

PROBLEMS OF SURVEYED BUILDINGS

BUILDINGS			D01	D02	D03	D04	D05	D06	D07	D08	TOTAL
STRUCTURAL PROBLEMS	DAMPNESS PROBLEMS	ON STONE MASONRY	●	●		●			●	●	5/8
		ON ROOF ELEMENTS	●	●	●	●	●	●	⊗	●	7/8
		AS A RESULT OF LACK OF GUTTER	●			●	●	●			4/8
		LOSS OF MORTAR	●		●	●	●	●		●	6/8
	CRACK ON MASONRY					●					1/8
INFLEXIBLE ADDITIONS AND ALTERATIONS	SPATIAL ALTERATIONS	INFLEXIBLE WALL ADDITION		●		●			●		3/8
		CONCRETE FRAMED MEZZANINE FLOOR ADDITION				●			●		2/8
		OPENING SKYLIGHT ON TIMBER ROOF				●		●			2/8
	SURFACE ALTERATIONS	WALL PLASTER		●		●			●		3/8
		WALL MOUNTED ELECTRIC FIXTURES	●	●			●	●	●		5/8
		ALTERED ROOF ELEMENTS		●		●		●	●	●	5/8
		CONCRETE SCREED OR CERAMIC TILE FLOOR FINISHING	●	●	●	●	●	●	●	●	8/8
PROBLEMS DISTRUPTING THE FACADE UNITY	ORIGINAL PROPORTION LOSS	CLOSED WINDOW OPENING			●						1/8
		CHANGED DOOR OR WINDOW PROPORTION				●	●				2/8
	ATTACHMENTS	AIR-CONDITION FAN					●	●	●		3/8
		ELECTRIC BOX		●	●	●		●	●	●	6/8
		OUTDOOR LIGHTING FIXTURE	●	●						●	3/8
		SIGNBOARD	●		●			●			3/8
		STOVE PIPE		●	●						2/8
	SURFACE PROBLEMS	LOSS OF PLASTER			●		●				2/8
		COLOR CHANGE WITH PAINT	●	●			●	●			4/8
		GRAFFITI ON PLASTERED FACADE			●				●		2/8
SPATIAL PROBLEMS	LACK OF WET SPACE				●					●	2/8
	LACK OF WET SPACE VENTILATION		●	●		●	●	●	●		6/8
	INSULATION PROBLEM		●	●	●	●	●	●	●	●	8/8
	INSUFFUCIENT LIGHTING		●	●	●	●	●	●	●	●	8/8

Table 4.9. Table Showing Distribution of Problems Observed in Eight Surveyed Depot Building.



common interior alterations which are irreversible interventions. Under the title inflexible additions and alterations those interventions have specified as surface alterations and spatial alterations. As seen in Table 4 10, surface alterations are more common than spatial alterations however it is observed that spatial alterations have more potential impact upon the change ratio of buildings. For detailed information on irreversible spatial alterations please see Table 4 9.

After spatial problems, the second common problem among 8 studied Ayvalık depot buildings are problems disrupting façade unity which shown in the pie chart in Table

4 10. Attachments on front facades of buildings are the most common problem which results as visual complication. Loss of proportion because of interventions on front facades and surface treatments are other observed factors of disrupting the façade unity. For detailed information on irreversible spatial alterations please see Table 4 9. Decisions should be made about those issues for the sustainability of Ayvalık depot buildings and conservation of the historical industrial pattern. In spite of this fact; the new proposal also shouldn't cause that kind of disruptions as principle.

4.3.3. Potential

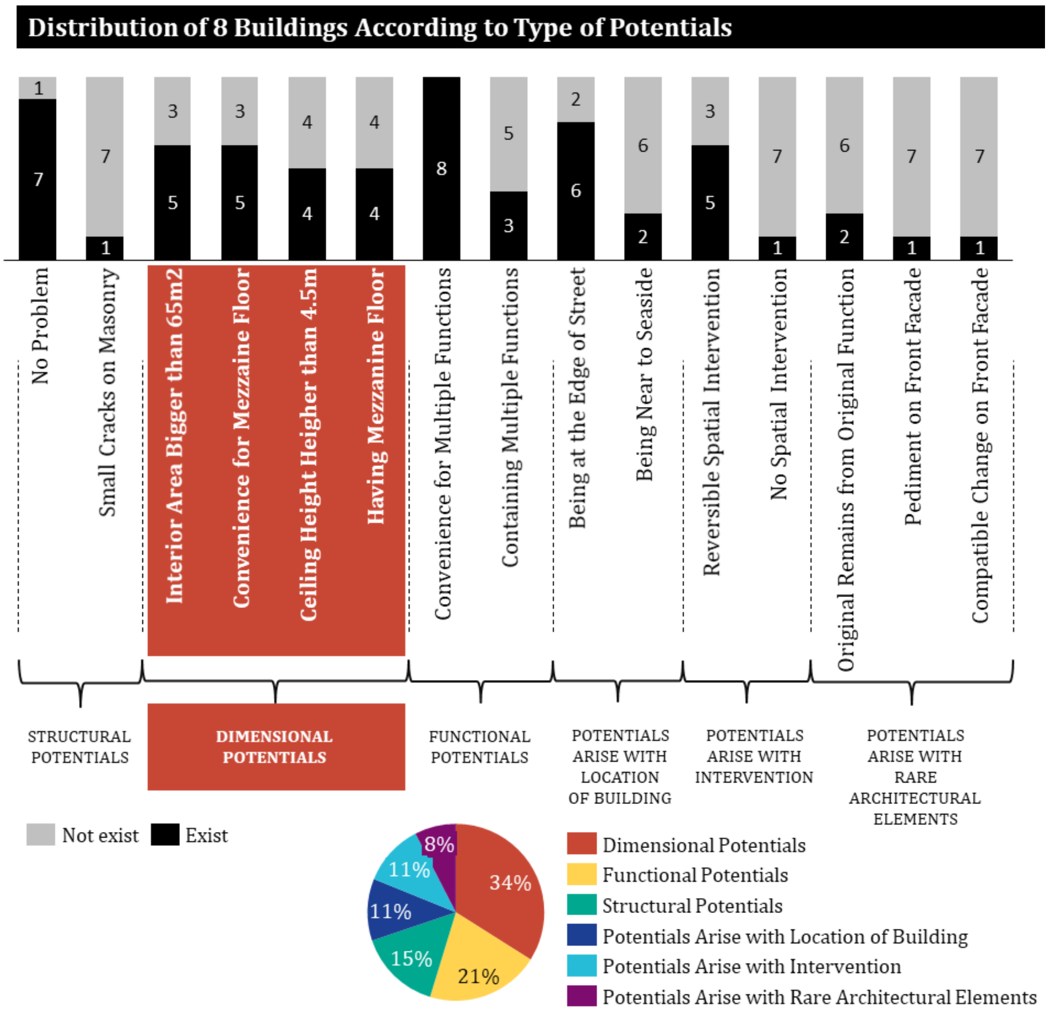
Although the existent problems related to depot buildings; different potentials of each building and potential of the depot building stock within Ayvalık have great importance. In that respect; with building by building inspection, potentials of studied buildings attempted to raise. Thus; a table has prepared which classifies observed potentials of buildings (see Table 4 11). The titles under this classification are, structural potentials, dimensional potentials, functional potentials, potentials arise with location of building, potentials arise with intervention, potentials arise with rare architectural elements. Within this classification, when looked at the distribution of the majority dimensional potentials of depot buildings are seen in the forefront. Because those buildings are single-spaced and mostly have free spaces without built-in partitions, their dimensional potentials needed to be evaluated.

Table 4.10. Table Derived from the Evaluation of the Potentials of Ayvalık Depot Buildings

POTENTIALS OF SURVEYED BUILDINGS											
BUILDINGS			D01	D02	D03	D04	D05	D06	D07	D08	TOTAL
STRUCTURAL POTENTIALS	NO PROBLEM		●	●	●		●	●	●	●	7/8
	SMALL CRACKS ON MASONRY					●					1/8
DIMENSIONAL POTENTIALS	INTERIOR AREA BIGGER THAN 65 m^2				●	●	●		●	●	5/8
	CEILING HEIGHT HIGHER THAN 4.5 m			●		●		●	●		4/8
	HAVING MEZZANINE FLOOR					●	●	●	●		4/8
	CONVENIENCE FOR MEZZANINE FLOOR			●		●	●	●	●		5/8
FUNCTIONAL POTENTIALS	CONTAINING MULTIPLE FUNCTIONS	2	●			●					2/8
		more than 2					●				1/8
	CONVENIENCE FOR MULTIPLE FUNCTIONS	2	●	●				●			3/8
		more than 2			●	●	●		●	●	5/8
POTENTIALS ARISE WITH LOCATION OF BUILDING	BEING AT THE EDGE OF STREET		●		●		●	●	●	●	6/8
	BEING NEAR TO SEASIDE								●	●	2/8
POTENTIALS ARISE WITH INTERVENTION	NO SPATIAL INTERVENTION									●	1/8
	REVERSIBLE SPATIAL INTERVENTION		●	●	●		●	●			5/8
POTENTIALS ARISE WITH RARE ARCHITECTURAL ELEMENTS	PEDIMENT ON FRONT FACADE			●							1/8
	ORIGINAL REMAINS OF ORIGINAL FUNCTION					●	●				2/8
	COMPATIBLE CHANGE ON FRONT FACADE					●					1/8

As seen in Table 4 12 pie chart, dimensional potentials are having higher percentage before functional potentials. Those two potentials are covering almost 50 percent of the whole observed potentials of buildings. For this reason, the principles driven for fulfilling the requirements which need for meeting the buildings potentials, to arise new potentials coming along with the use-values of buildings.

Table 4.11. Table Showing Distribution of Potentials Observed in Eight Surveyed Depot Building.



As a principle, the decision of using a modular system for the different potentials of buildings has given. With that decision, the added modules in different functions related to different services needed in buildings in different dimensions have aimed to be fulfilled.

CHAPTER 5

CONSERVATION PRINCPLES AND MODULAR PROJECT PROPOSAL FOR ADAPTIVE RE-USE OF AYVALIK DEPOT BUILDINGS

The information required to define conservation principles, design requirements and general approach of the intervention has formed regarding the definition of characteristics of depot buildings, their values, problems and potentials in previous chapter. The significance of Ayvalık depot region studied and with respect to those studies for solving problems, extending the life and use spans of depot buildings in healthy structural conditions it found out that providing optimized intervention type to prevent them from future dangerous interventions needed to be given.

At present state, there are approximately fifty traditional depot buildings spread among the southern and northern commercial areas of Ayvalık industrial center. (Utta Planning, 2019) As studied in previous chapter, those buildings have great potential with their size, location near seaside and opportunity to adaptive reuse.

Within the scope of this chapter, at first conservation principles which assesses what should not do to Ayvalık depot buildings are arisen. No matter the new function given to a depot building, which values should be sustained to the future is the main aspect of these principles. Secondly, general decisions that define a design approach for conservation of depot buildings have mentioned. Then; according to the user preferences and type of use; the designed modules are identified with supporting drawings, charts, and visuals in terms of their proposed functions. In conclusion, the general structure of the thesis has been appraised. In addition to this, why traditional buildings are assessed as cultural heritage and why should they be conserved are other concluding remarks. The offered modular proposal in that context will be evaluated and to sum up the approach of the interior architect will be mentioned.

5.1. Conservation Principles Derived from the Assessments on Value, Problem and Potentials of Ayvalık Traditional Depot Buildings

These principles are declared in order to constitute the sustainability of the traditional depot buildings to future generations. Those buildings are important industrial heritage loci of Ayvalık which do have flexible interior spaces with their size and empty mass. The traditional construction technique that is harmonious with the rest of the traditional industrial and residential pattern of Ayvalık, is one of the most significant subjects to conserve those buildings. As mentioned before, some of the depot buildings are located closely but some of them are separated from those. In that manner to make contribution to the sustainability of those; it is important to offer a flexible and straightforward proposals.

To begin with, in order to construct a base for future interventions about physical problems observed in the context of this thesis principles should be declared. It should be pointed out that the intervention principles are simple treatment suggestions, but holistic studies shield be prepared through detailed structural and material analysis as a completed study with related experts to reach the best results.

- To avoid unnecessary interventions, the obsolete principle is to limiting interventions to a minimum range.
- It is important to investigate buildings one by one, what are the agents cause physical problems and control them. Load-bearing walls that are damaged by the dampness problem should be investigated detailly.
- The seismic precautions should be taken into account because of the earthquake risk. (Because of located on the first-degree earthquake zone)
- It is important to organize the future interventions for the implementation techniques, appropriate use of materials.

In section 4.2.3, observed changes are grouped according to the change type. For the changes future intervention principles should be as below;

- The first and important intervention principle is to avoid disrupting space integrity of depot buildings with huge masses. The effect of large volume should not be lost.
- The previous qualified alterations within the history of each building should be conserved unless it gave harm to the original structure. If they give harm; they should be removed for the interior harmony of buildings.
- The original architectural elements shouldn't be changed or removed. The intervention strategy should be conducted to preserve the original elements or traces of them.
- Previously made architectural element changes as windows or doors can be replaced with the original ones or with a more compatible one if existing is not appropriate. Façade integrity of buildings should not be intervened.
- The future interior spatial additions should be demountable structures for being able to recycle. Should not be made irreversible changes additions inside the building and should not give permanent harm to the building structure or original architectural elements.
- The plumbing line for wet spaces of interior addition should be dissolved in a single line in order to give less damage to building.

Studied depot buildings are evaluated with their existing and original functions within the context of this thesis. Principles derived related to the new functioning of depot buildings are as below;

- If possible, original function which is depot and storage should be preserved for the sustainability of the culture and tradition of olive and olive oil making.
- The new function proposal should be developed according to the assessed values, problems and potentials of buildings.
- New function proposal should be appropriate for the user profile and building itself. It should have positive effect on its close environment.

- Material selection for the new function should be reversible and they should reflect the present technology and be compatible with the existing structural materials. They should be durable and environmentally friendly.
- All interventions related to new function should be recognizable and preserve the existing structure's character and spirit.
- The effect of re-functioning on environmental level should be managed as depot building stock is spread through the commercial area and effect local users of that zone.

5.2. General Approach and Principles for Design Requirements of Proposed Modules with Respect to Different Preferences and User Requirements to Preserve Traditional Depot Buildings

Depot buildings which are the alive witnesses of history from the end of 18th century, are the main scope of this thesis, are the important assets which give the industrial landscape characteristics to the townscape. They are symbolizing the cultural development of a decent era of the city and also showing us how the socio-economic status of people living in that past. The adaptation of those buildings without giving harm to them is a way of connecting this past with today's life cycle. As mentioned before; some buildings have lost their functions and they are in abandoned situation and some of them need functional upgrades for the continuation of their use value. In that manner; adaptation of those empty and large spaces of traditional buildings become an essential point for the conservation of them with adaptive re-use strategies.

With the acknowledgement of general structural conditions of studied depot buildings, it can be admissible that, with small interventions buildings can be adequate for their new uses. So, in that respect; while giving decisions about the general approach, it will be assumed that the small problems about the existing condition of buildings are solved before the insertion of newly designated functions. The insertion's main goal is to upgrade the service area which appear as problematic wet spaces in existing buildings including WC and kitchen functions. General principle for the designed insertion to existing building is; generating number of separated service modules which integrate with each other through a service hauler wall for diverse dimensions of depot buildings and for diverse needs of the designated functions of buildings. The main aim is to gather electrical, mechanical and plumbing systems into a vertical structural element and gather functions around this service wall back to back of each other.

To enhance the function and quality for every user, designers should confront needs of the inclusive design principles. Interior designers' goal is to determine relationship of people with spaces based on psychological and physical parameters to improve the quality of life (Savage & Friedmann, 2019). Universal design principles which allow everyone to make their operations without help of anyone in their daily life are especially important for interior architects and product designers. In order to understand universal design; definition of it can be instructive. According to National Disability Authority;

> "Universal Design is the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size, ability or disability. An environment (or any building, product, or service in that environment) should be designed to meet the needs of all people who wish to use it. This is not a special requirement, for the benefit of only a minority of the population. It is a fundamental condition of good design. (National Disability Authority, 2014)"

In design processes; usually constraints related to the material, time, budget and some other factors are overlooked. As necessary as those constraints; user information which includes diverse ages, abilities and physical status is required for designers.

In that respect, local constraints about users should be mentioned when a design proposal is prepared. Based on the Turkish Statistics Institutions survey on 2018, Balıkesir is on the 7th rank among other cities of Turkey in 65+ age.[13] Ayvalık is one of the districts of Balıkesir city and according to TURKSTAT, the share of 65+ population has raised from 2007 to 2018. In 2007 the share of 65+ population with

[13] TURKSTAT Address Based Population Registration System

respect to the total population of Ayvalık was 11.5 and in 2018 it raised to 17.9. Therefore, it is it is especially essential to incorporate inclusive design principles for Ayvalık depot buildings.

Universal Design principles can be considered under seven categories. These are; equitable use, flexibility in use, simple and intuitive use, perceptible information, tolerance for error, low physical effort, size and space for approach and use (Preiser & Smith , 2011, p. 59). Those principles are generated for providing the same means of use for all people avoiding segregating and stigmatizing any users and suggesting choice in method of use. The good design for everyone should be easy to understand it should communicate with the user regardless conditions or users' sensory abilities and the elimination of unnecessary complexity should be considered. The fifth principle tolerance for error is important for avoiding or minimizing hazards of unintended actions which covers designing elements to minimize errors. In addition to those; efficiency for the user should be considered for minimizing repetitive actions or uncomfortable body positions. The design should be used comfortably without any fatigue. As well as those mentioned; making all components and spaces in the environment accessible and making them reachable for standing and seated user is serious principle which should be followed. As a general approach for the new insertion for Ayvalık depot buildings, minimum clearances for doorways and adequate space sizes have to be considered. In addition to this; materials which are adequate chosen for ensuring hard non-slip and stable surfaces.

5.3. Principles for Design Requirements Related with Physical and Functional Problems of Studied Depot Buildings

These principles are formed in order to establish a base for the new insertion for enhancing some physical and functional problems of eight studied depot buildings. It should be mentioned that; assessments derived from the buildings about the physical conditions and problems are prepared according to visual observations and dialogues with existing users. In that manner; it should be pointed out that these kind of studies about structural and material analysis of buildings should be made by related specialists and in a more detailed way to observe and reach concrete results.

As mentioned earlier in section 4.3.2 problem assessment of studied buildings, the most common observed problem is spatial problems that branched into four sections. Mainly; lack of wet spaces, lack of ventilation in wet spaces, insulation problems and insufficient lighting. In on-site observations, it is seen that to form wet space functions as WC and kitchen, some jerry-built structures in poor conditions were used. At the same time, some buildings which are in use don't have any wet spaces. Accordingly, the principles derived from those assessments as;

- Main principle for this section will be providing an insertion into the existing depot building without any or minimized intervention (small interventions can be made to provide sewer system, ventilation or electrical system. They should promote reversibility and should not affect the authenticity of existing building).
- For providing flexibility and demountability modular design principles and diversity in use are accepted. They also define design complexity.
- The new insertion will be on raised floor system which is to avoid from giving unnecessary harm if building has original floor covering.
- Adding adequate space for WC with necessary equipment suitable for universal design principles.
- Adding adequate space for kitchen with necessary equipment suitable for universal design principles.
- Providing sufficient ventilation for provided functions.
- Providing sufficient lighting for provided functions.

5.4. Modular Project Proposal for The Adaptive Re-Use of Depot Buildings

Within the light of theoretical base mentioned in section 2.1, "building as a shell structure upon the new insertion" Ayvalık depot buildings are used as the shell structure upon the new modular insertion. Being modular will propose and allow different scenarios for the use of many depot buildings spread along the historical industrial pattern of Ayvalık city center. As the starting point of the proposal is coming from the functional needs and problems of depot buildings, most important design goal for this project is conserving the depot buildings by increasing their use value and sustain the continuity of those traditional buildings through future generations.

The future users will not be defined one by one within studied depot buildings. Instead, functions that the proposal generates will be defined and it is expected to be chosen by the future owners or users. It must be stressed that; the first and most important problem to solve is the lack of wet areas and upgrade the existing ones inside buildings. In that manner, this is a proposal for both buildings which are in use today and the empty ones for future owners/users. The author's choice about the use of depot buildings as local residential buildings. It should be mentioned that; Ayvalık is under a strong gentrification danger because of the internal migration from big cities of Turkey such as, Istanbul and Ankara. Because of the danger of loss of identity, the future interventions should be designated taking this fact into consideration. In this study, design materials are selected budget friendly and modularity is chosen for decreasing the reuse budget with a great design complexity.

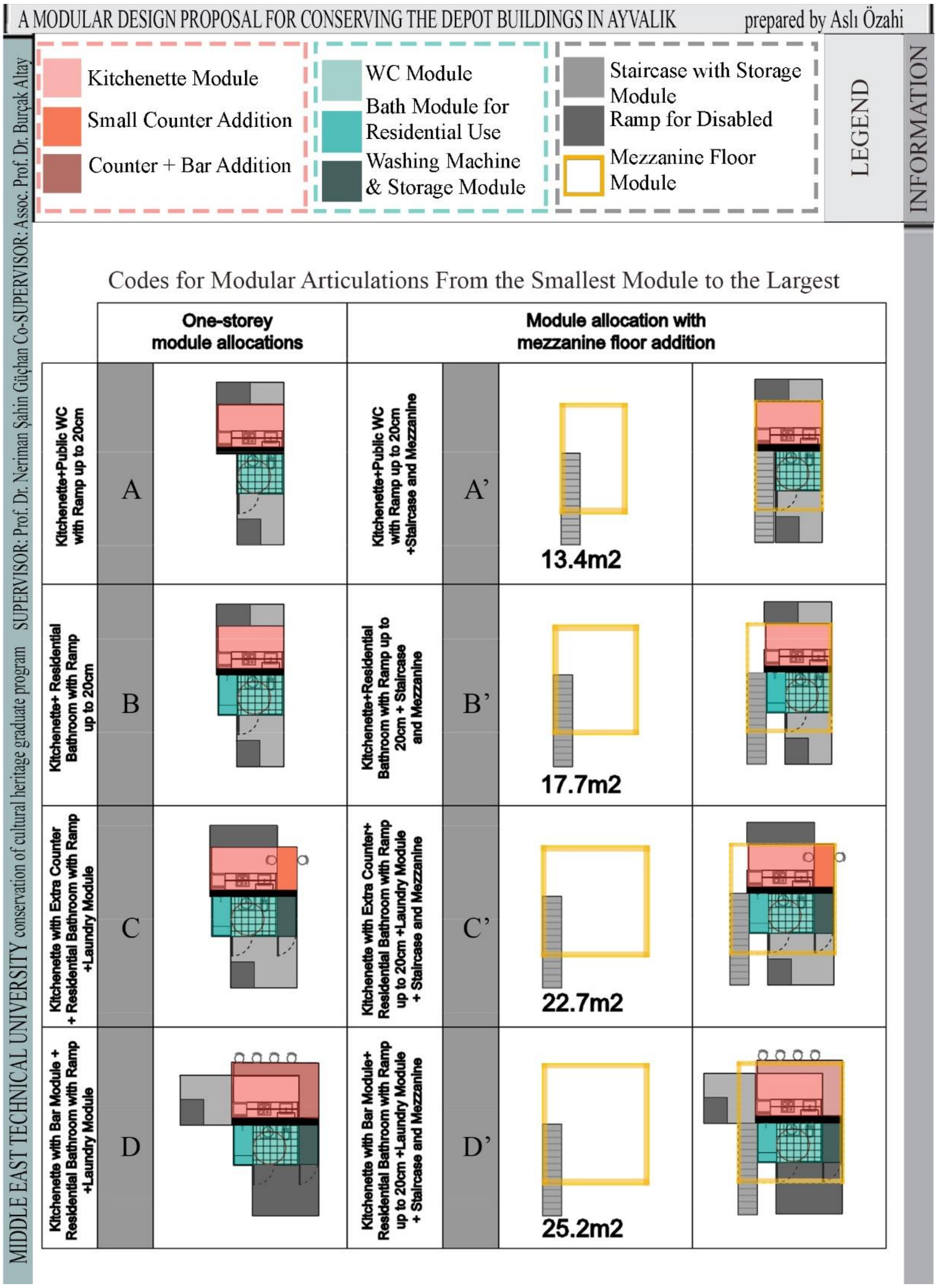


Figure 5.1. Codes for Module Articulations According to Their Elements and Sizes

The project proposal identifies a common service wall designed to function on both sides and back to back WC and kitchenette functions basically. The modular system designed in proportion with the eight studied depot buildings which help to encompass experiencing a wide range of building sizes. Besides the needs of buildings, future needs of the possible users tried to be forecasted and solved under the modular system design. In the scope of this thesis three of the buildings has been modelled in 3D and will be presented at the end of the definition of the project proposal. The new design neither has any direct connection with the buildings nor, constitute extra weight to them. A raised floor system used to ensure modules stability creates a floor covering and also hides the connection of insertion sewage system fixtures and equipment. In addition to that; raised floor system is used to avoid damage to an existing floor covering although no original floor coverings were found in the studied buildings.

Except the service wall, the design consists of three sections as kitchen, WC and circulation elements. Those sections have branched from the base module with additional small modules and one by one, every small module brings its function with respect to user preference. Conceptually design inspiration came from the modular prefab buildings which structured a finished building when modules formed by small components come together. In addition to this; a possible mezzanine floor module is designed upon ground floor modules where interior height is higher than 4.70m.

5.4.1. Modules

First of all; it would be right to start stressing about the definitions of modules A, B, C, D before mentioning about the details of the design (See Figure 5 1). Module A is the basic and smallest module designed for the smallest depot buildings. It offers a small kitchenette and a public WC with the circulation elements as ramps up to the raised floor of modules. If the depot building which this module is installed has enough height (higher than 4.70 m) the self-standing staircase module and mezzanine module can be added. The code for this allocation is A’ as it is basically the same module with mezzanine floor addition. The module A occupies approximately 10 m². If the mezzanine floor added to this module allocation it adds approximately 13.5 m^2 to the space it installed. Module B is the smallest module for the residential use of a depot building. It includes a residential bathroom with adequate space and a flush floor finished shower module for disabled. It is possible that, if the function the building will be given would not be a residential use, the shower module can be reformed as a place for washing and drying machine placed. That space can also be used as extra storage area according to preference of the occupant. The Module B', with the staircase and mezzanine floor addition, adds 17.7 m^2 extra usable area inside the building. Module B' also creates the smallest loft style structure designed for depot buildings. With the use of this module, depot buildings can be used as home offices or a small home for a family of two.

Module C has two more small integrated modules which brings more functional opportunities for occupants. The first one is the extra counter beside the kitchenette module which also acts as a table and extra storage area with two drawers underneath. This extra surface can be assessed also for commercial use if the building would be used as a café or atelier. Laundry module which designed with its own ventilation and storage area is the other sub-module of Module C. It occupies approximately 16.6m^2 with the ground floor plan layout and if the ceiling height is suitable for mezzanine floor, it adds 22.7m^2 usable area to the building.

The last module allocation is the largest with the most complex sub module allocation designed for massive buildings with large spans. This module is mostly suitable for two different functional use of building as café and a house for 3 or 4. Module D ground floor layout occupies approximately 20m^2 area. In this module allocation of kitchenette module has a dominant role inside the depot building with the bar module attachment beside it. As the area it occupies at ground floor increases, the area that mezzanine floor contains approximately 25m^2 area which can be used as 2 different bedrooms for a family of 4 or an open office area.

As mentioned in Section 3 Figure 3.11 the typology of depot buildings defined according to their façade types and the area that they occupy. With respect to this information; the studied buildings are grouped according to their shapes on plan layouts and the surface area. As such; in Figure 5.8 chart shows us 3 groups of buildings according to their forms and sizes. In addition to that, different module articulations are shown by allocating them inside buildings. It can be seen that; almost in all buildings; the service wall is located perpendicularly to a blind wall and either one side of mezzanine floor uses existing buildings stone masonry wall on that side. Besides all these; this work reveals that with different module allocations, buildings can be used in different ways. The goal of flexibility along with the complexity of design was achieved with using the modular design principles as a tool.

5.4.2. Finishing & Construction Materials

When it comes to structural and material details of modules, the maximum attention has been given to local and low-cost alternatives. Furthermore, durability and load carrying capacity are considered for the stability and sustainability of the new insertion in the long run. The main material used to structure walls and flooring is Egger OSB 3 panels which is ecology friendly, reusable and nontoxic material. This material has a resistance to humidity and also its load bearing properties is in high levels. It is also easy to shape this material likewise the timber material. The installation of wall and floor panels are with nails. On top and bottom of panels, aluminium C profiles are used to form walls in an organized and stable way. To form walls, steel box profiles with 30mm thickness in 5x5, 6x8 and 6x10 cm dimensions. The frame of raised floor, beams for the ceiling or the mezzanine floor module are also designed with steel box profiles. Steel is chosen for its properties like load bearing capacity and easy on-site installation besides its durability. Between the emptiness’ of 60 cm offsetted steel pillars, rock wool will be used for mostly for acoustic purposes and for heat insulation.

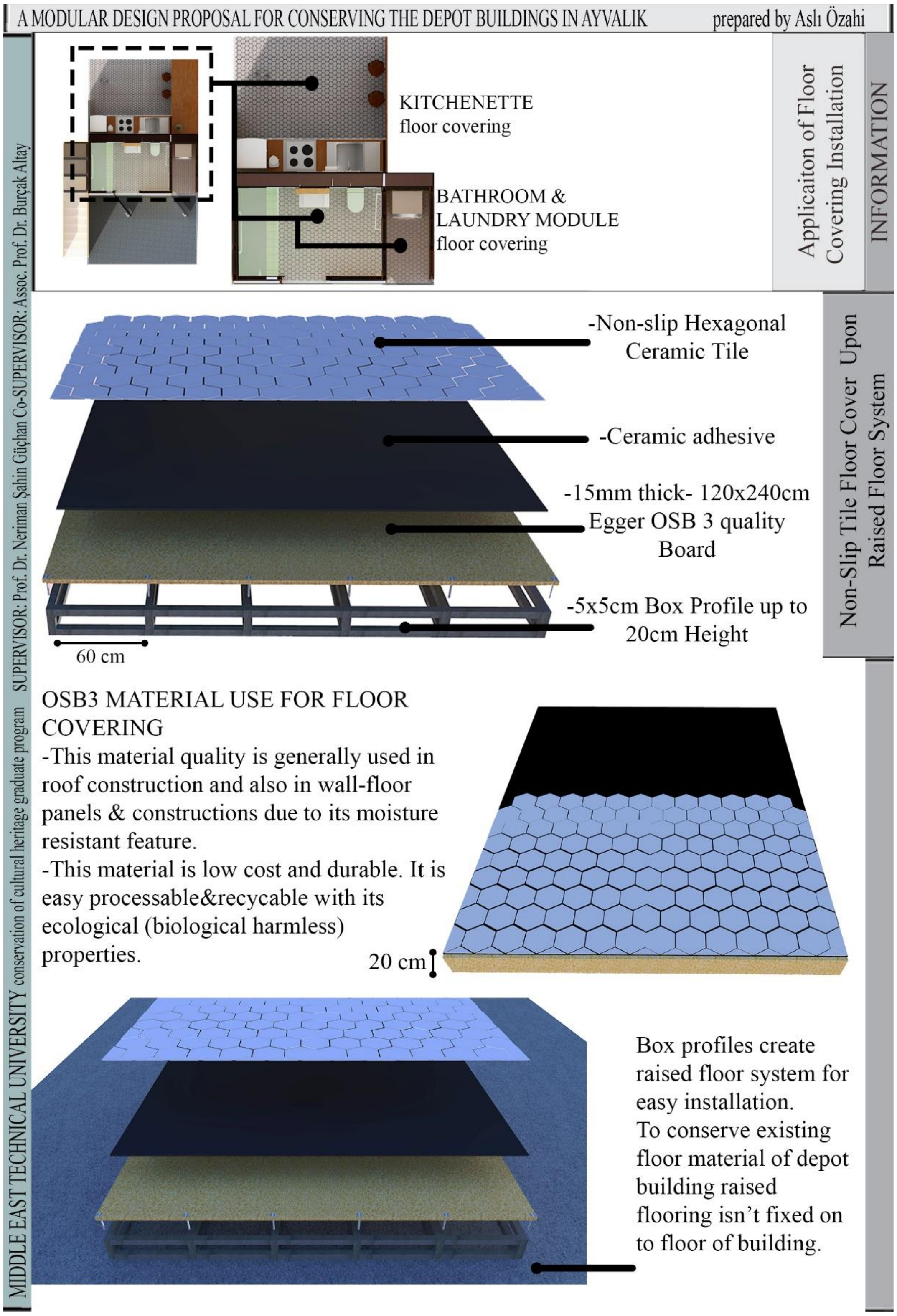


Figure 5.2. Application of Ceramic Floor Covering Installation

Floor covering materials are chosen as non-slip materials in terms of universal design principles. Non-slip ceramic tiles are used in wet areas to prevent accidents (See details in: Figure 5.2). For mezzanine floor, carpet flooring is suggested for creating a cosier ambiance and proposing a semi-private space for the users of building. If the mezzanine floor would not be used as residential purposes, upon OSB 3 panel

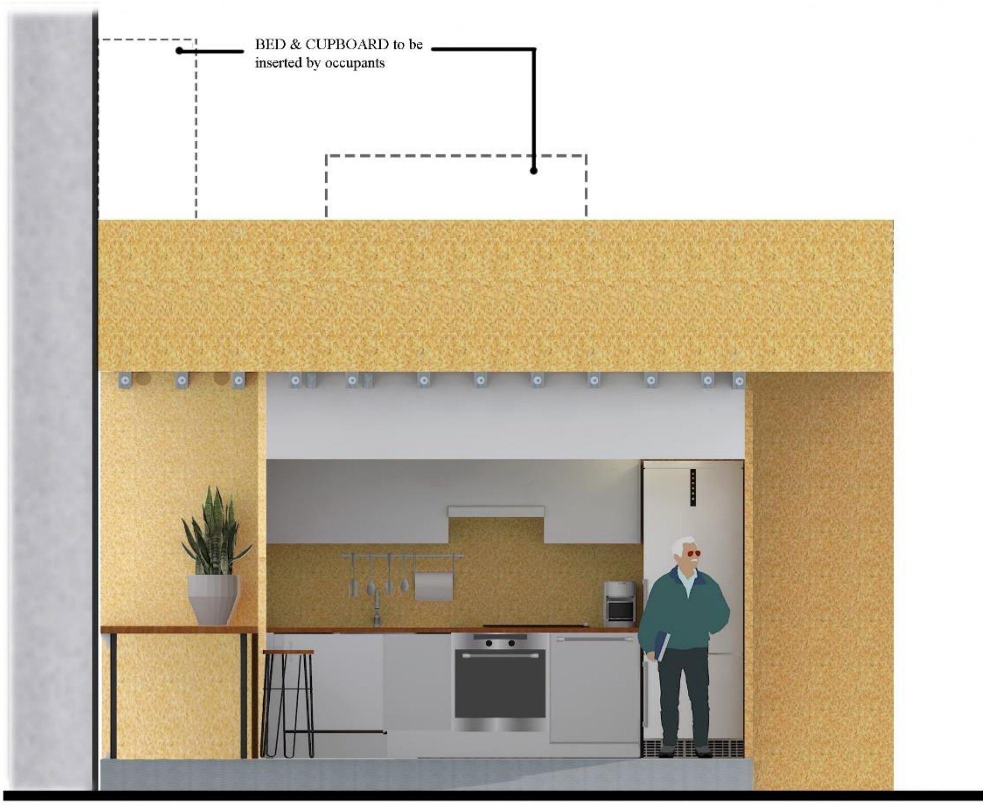


Figure 5.3. Front View of Module C Showing Kitchenette Module

layering, installations of dry flooring systems with timber or cork material could be used. For the ramp surfaces which enables accessibility, material selection made as embossed aluminium which has patterns on the surface to provide grips for non-slip surface. A material board in 3D can be seen in Figure 5.13.

If one by one, materials used in modules are examined, the use of three different kind of timber products can be seen in kitchenette module. At the back side of kitchenette cabinetry, OSB 3 panel have used. At that part; OSB panels can be treated with epoxy

Figure 5.4. Section Passing Through Staircase, WC and Laundry Modules.

resin, to resist moisture. On the other hand, ceramic tile can be installed to the backing according to the use preference. MDF boards laminated with white PVC surface are used for built-in cabinetry of kitchenette module. This material is chosen for the easy accessibility and low-price properties. In addition to that; for the durability of counter, hard wood timber is suggested as material. However, if the budget does not allow for hard wood, users should be directed to use PVC laminated wood products for the sake of design quality. As seen in Figure 5.3 under the counter module, storage area with drawer system which has the same design language with the storage area underneath staircase module are designed. For this, the same material used in built-in kitchen cabinetry will be used. In bathroom, application of ceramic on OSB 3 walls especially

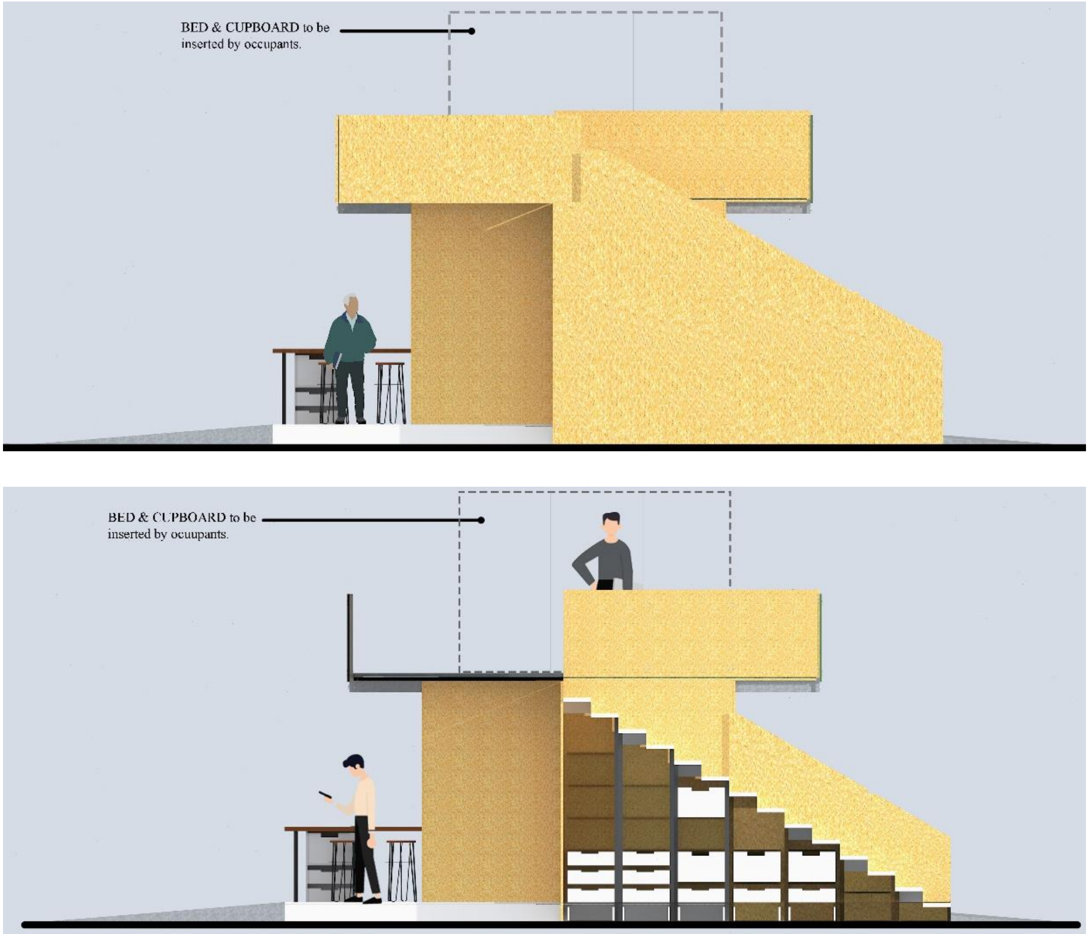


Figure 5.5. Above: Left Side View of Module C Allocation, Below: Self standing Staircase Section Showing Internal Storage Area.

to the flush finished shower area is important. In that area metal balustrades and a metal sitting unit should be provided for elder and disabled users.

Staircase module is solved in a self-load-bearing manner, which does not give extra weight to modules. With 110 cm width steps rises up to 240cm to mezzanine floor. Underneath the steps, storage area for occupants of building have provided. Balustrades designed in a way that have connection with doors of those storage as extensions up to 90cm height for all steps. For the steps, PVC covered MDF with non-slip grips used as material. For the internal storage area, 3 steps of shelf and drawer mechanisms have designed. The inaccessible upper shelfs are for rare used storage materials. The shelfs up to reach level 150cm, have rail system which can be used as surfaces out of the cabinetry up to 50cm. At last for the lower levelled shelfs, drawers which can be pulled out up to 50cm designated for the use as storage.

For disabled, it is suggested that, rather than using staircase module, a hydrolic elevator for residential purposes will be used. In researches, it is found out that hydrolic elevators can rise up to 3 m[14].

[14] Open Style Lift, https://www.cibeslift.com/product/open-style-lift-b385/, Home Lift, https://www.cibeslift.com/product/home-lift-cibes-a4000/

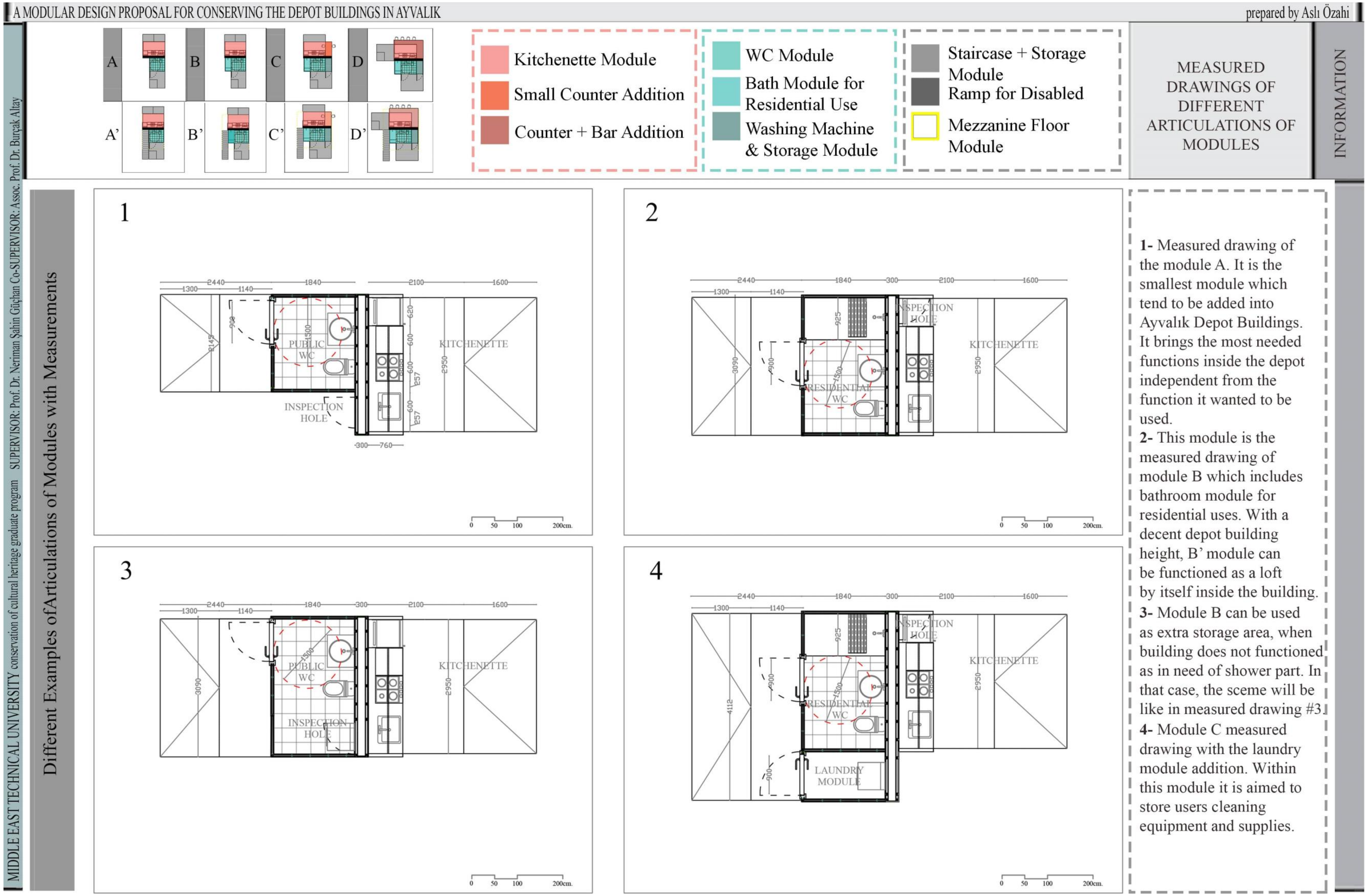


Figure 5.6. Measured Drawings for Different Allocations of Modules.

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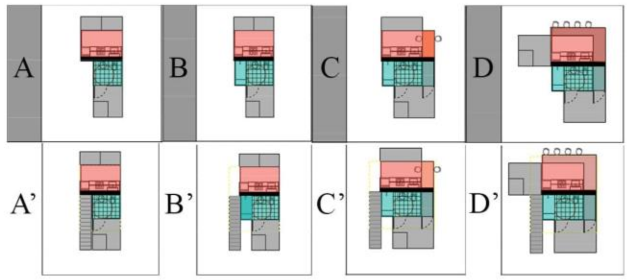
Different Examples of Articulations of Modules with Measurements



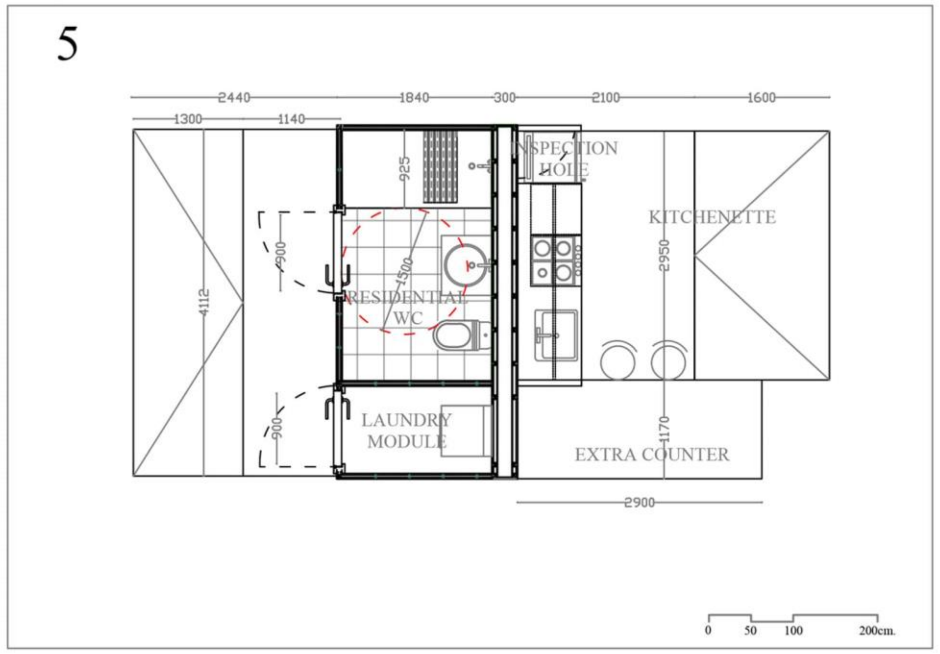
Kitchenette Module
Small Counter Addition
Counter + Bar Addition

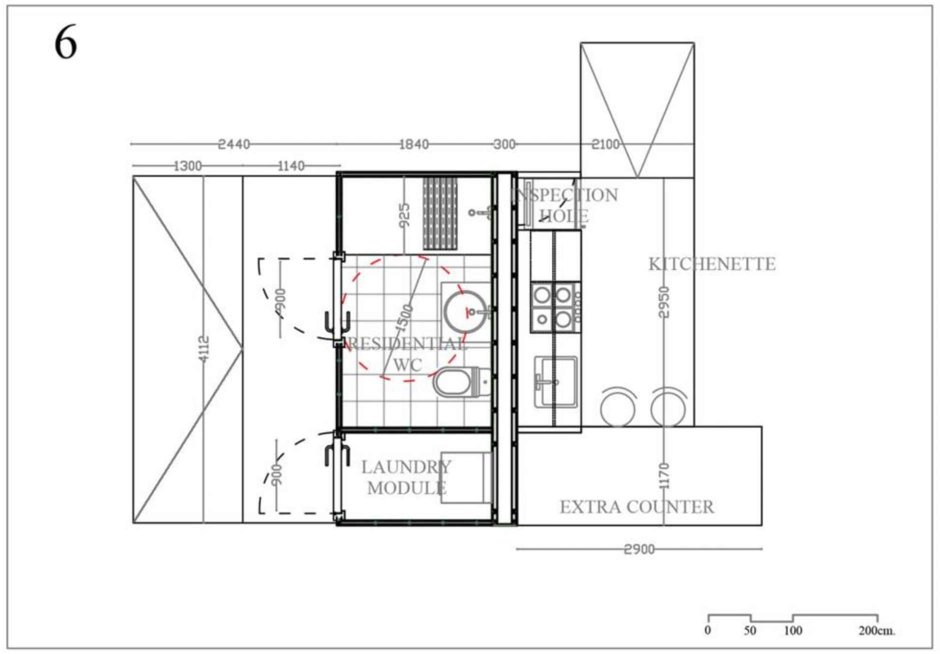
WC Module
Bath Module for Residential Use
Washing Machine & Storage Module

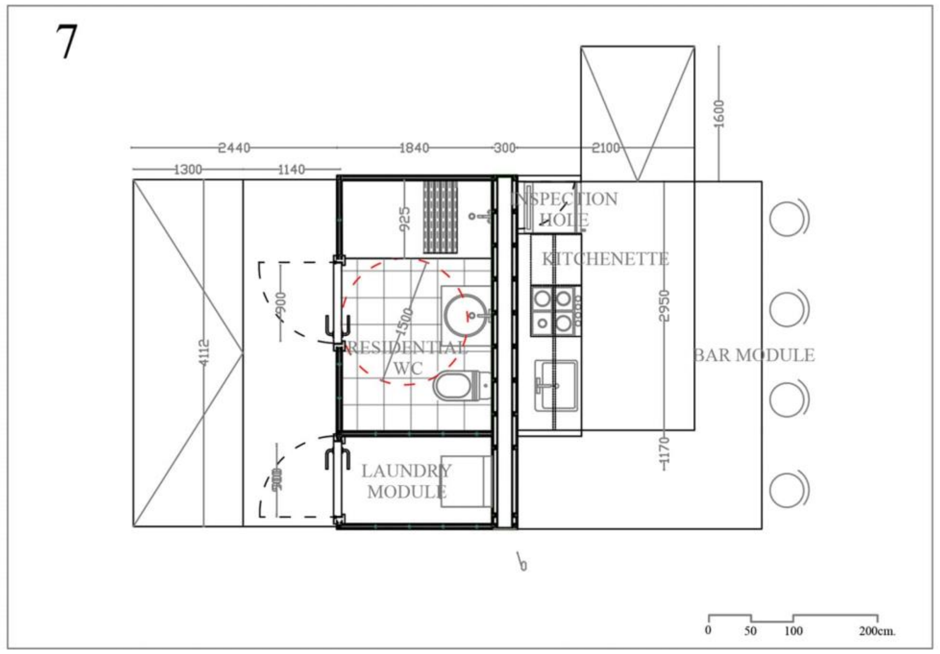
Staircase + Storage Module
Ramp for Disabled
Mezzanine Floor Module

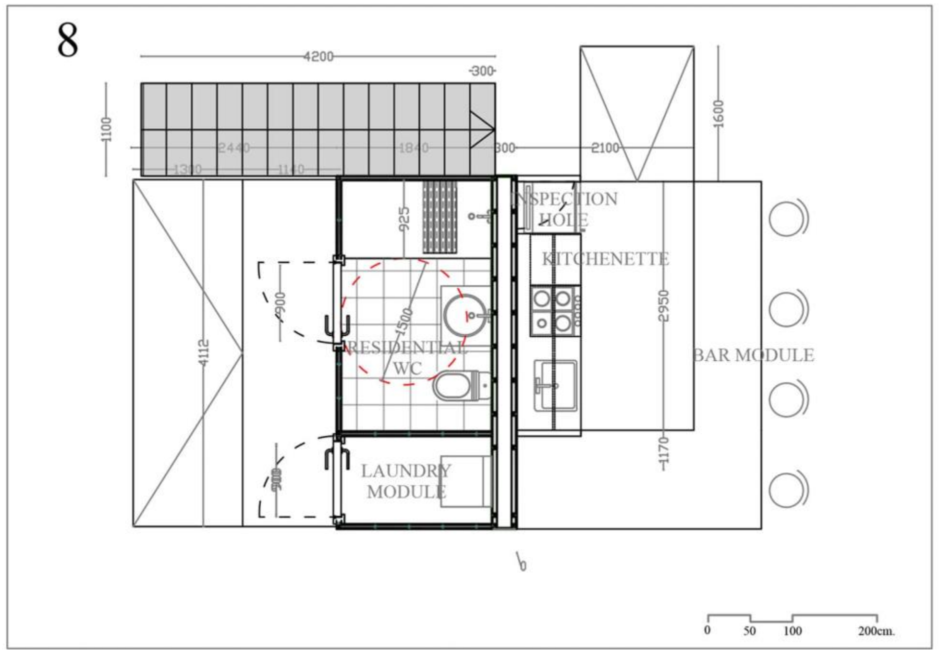
MEASURED DRAWINGS OF DIFFERENT ARTICULATIONS OF MODULES

INFORMATION









5- Measured drawing of module C with extra counter module addition. This module is for users who needs more work area inside kitchenette.

6- The ramp can be located at the side of kitchenette when adequate space does not exist on longitudinal side. Module allocation #6 shows that kind of layout plan.

7- Measured drawing of the module D with the bar module. This module allocation can be used in the need of multi functionality in space. If the size of the space is adequate for both commercial and residential use, this module can be used.

8- The samemeasured drawing with of module D with staircase module addition. Staircase module can be added to all plan layouts from 1 to 8 when depot building has suitable height for mezzanine floor. For disabled owner of building, rather than staircase, hydrolic elevator is suggested to use.

Figure 5.7. Measured Drawings for Different Allocations of Modules.

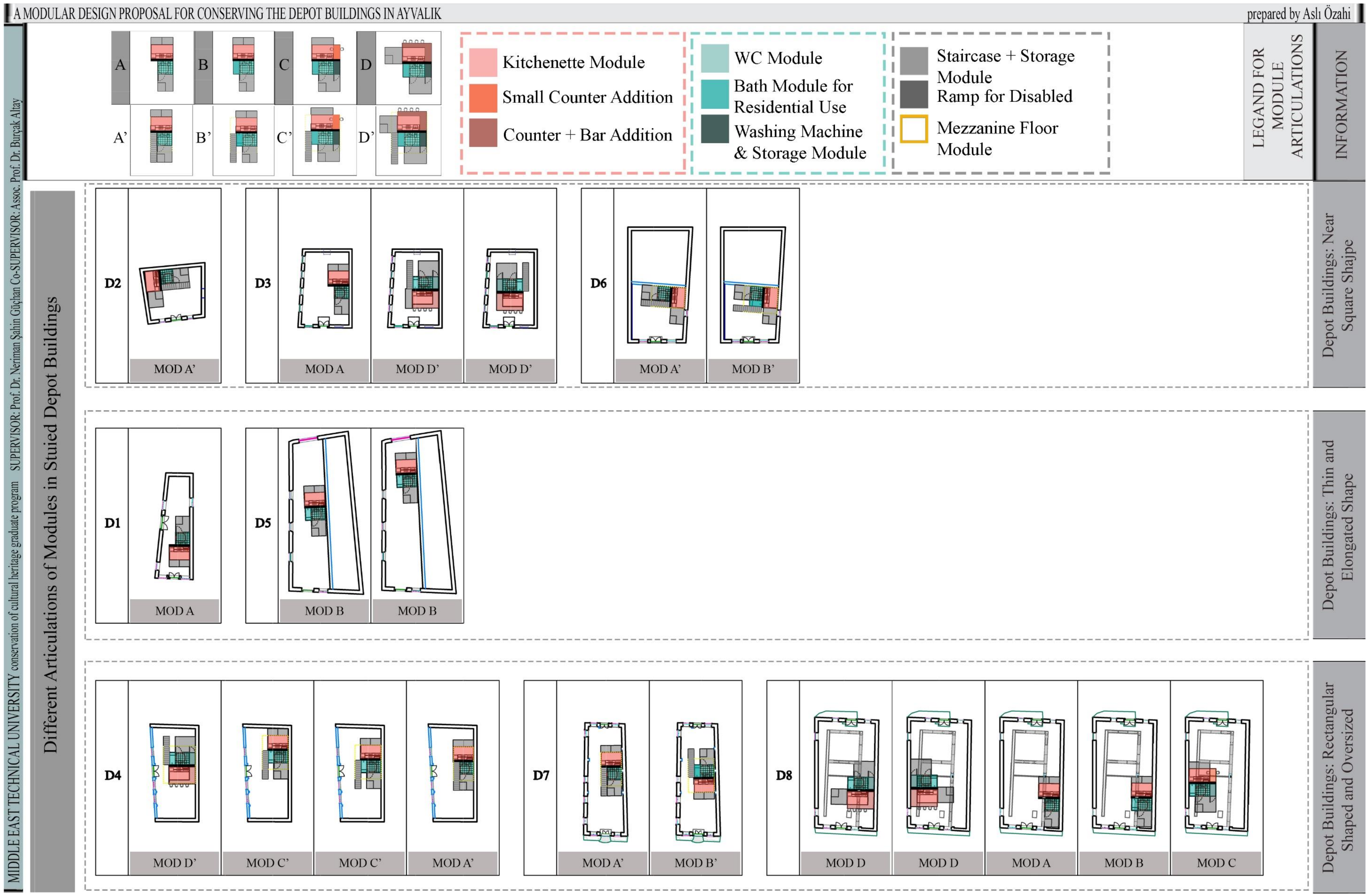


Figure 5.8. Figure Showing Different Articulations of Modules Inside 8 Studied Depot Buildings

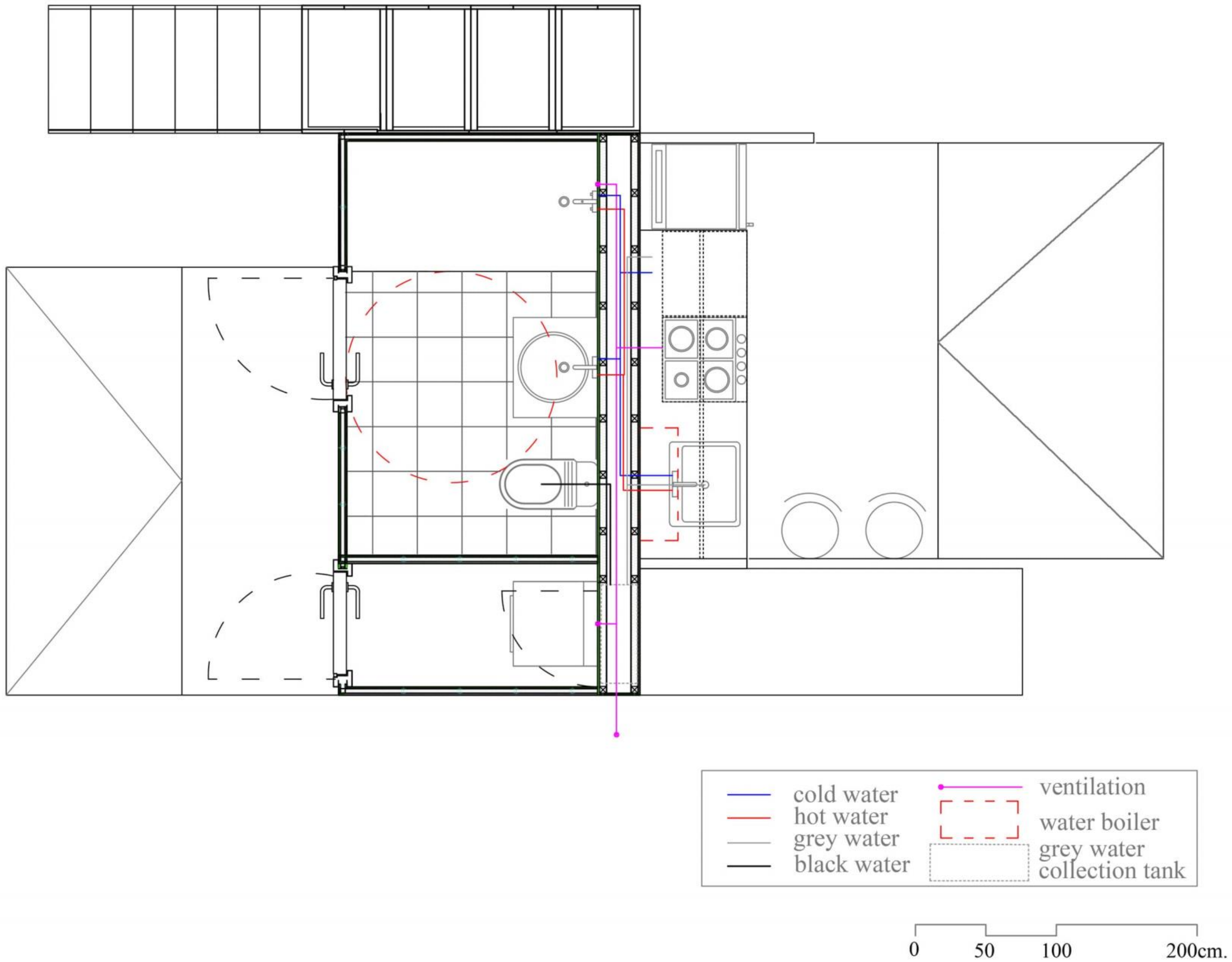


Figure5.9. Plan of Module C with Service Wall Mapping

PLAN OF MODULE C

Plan showing module C which is a moderate module with all designed elements.

The 30 cm service wall includes cold-hot water supply, grey-black water systems, grey water collection tank and ventilation system.

Back to back allocaiton of kitchenette and WC allows solution of all electrical, sewage and ventilation system inside one wall.

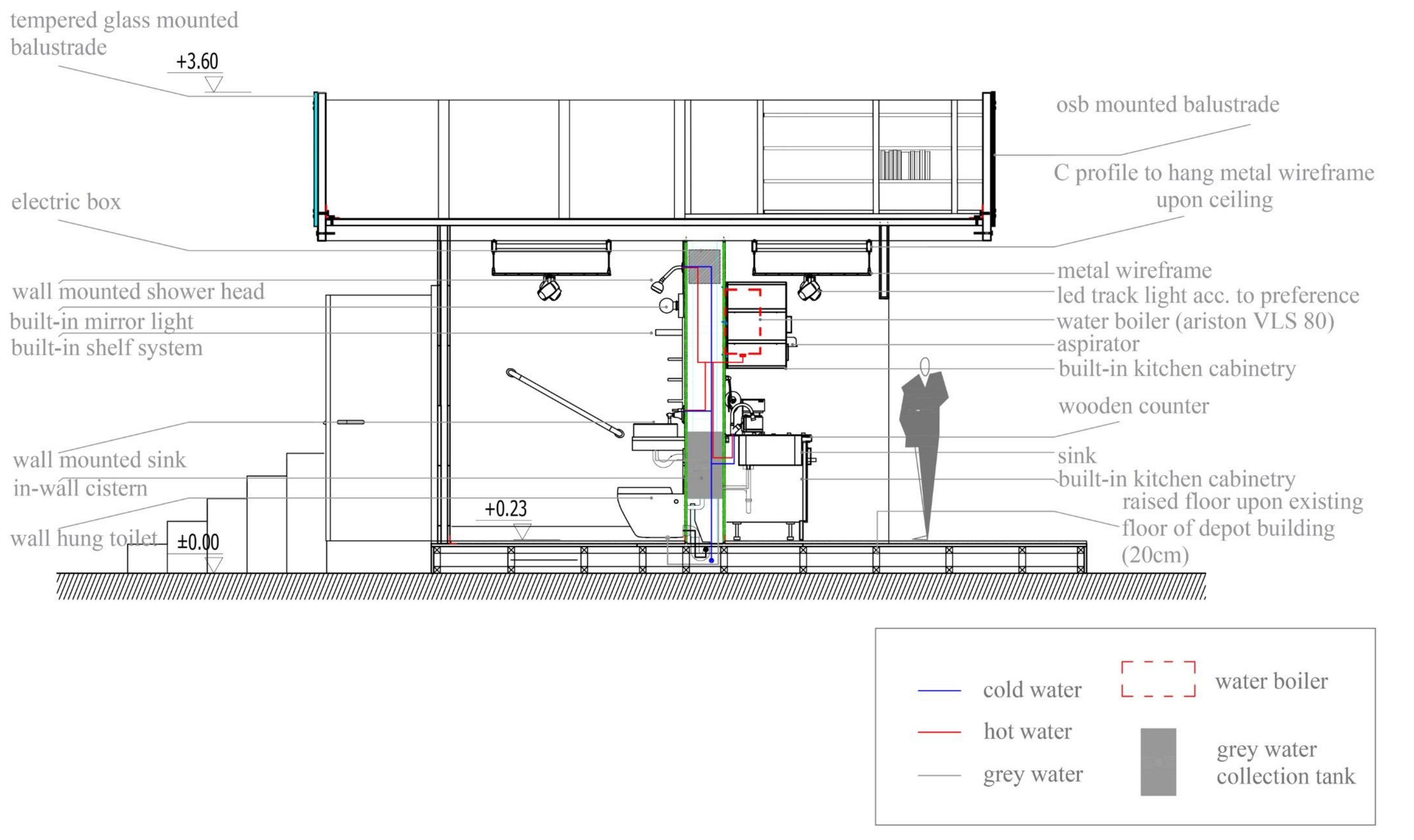
The hot water systems boiler is located inside the built-in kitchen cabinetry upon the sink.

Cold water supply and connection of black water with the general sewege system of Ayvalık city solved at the 20cm emptiness under the floor covering of kitchenette and WC modules.

Section AA' Drawing for Detailed Explanation of Module Details

SECTION A-A'

INFORMATION



SECTION A-A'

Section passes through the WC and kitchenette module which are core modules proposed to all 8 studied depot buildings.

It shows the technical background of the 30cm thick wall. Cold & hot water supply, grey water collection tank, electric box has located inside this service wall.

The water boiler which allows hot water supply is mounted upon the service wall located inside the built-in kitchen cabinetry.

Figure 5.10. Section AA' with Service Wall Mapping

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Section AA' Drawing for Detailed Explanation of Module Details

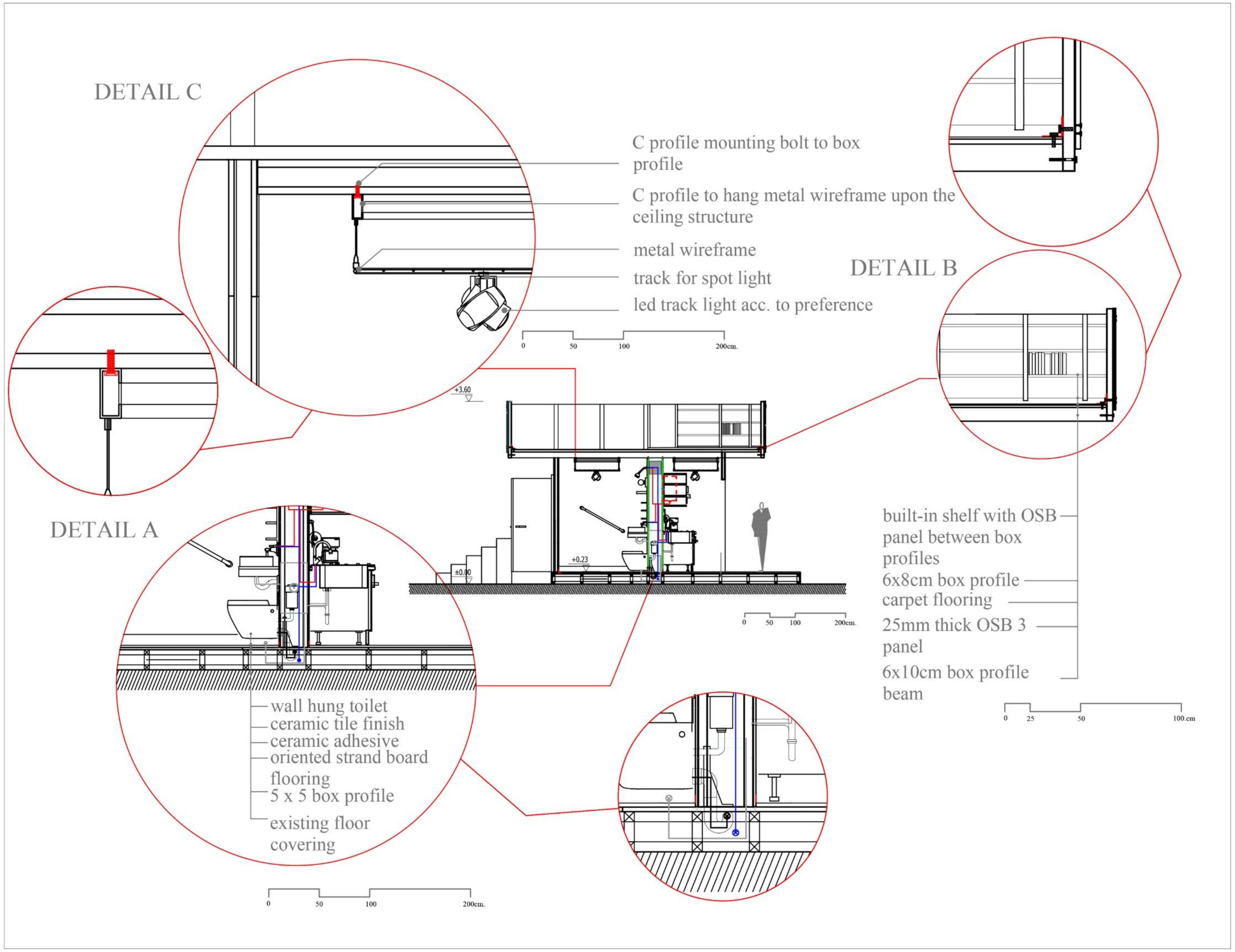

Figure 5.11. Detail Drawings A-B-C.

INFORMATION

DETAIL A
DETAIL B
DETAIL C

DETAIL A

Connection of the 30 cm servşce wall and raised floor cover of modules. 15mm OSB 3 panels are fixed on to 6 x 10cm box profile.

DETAIL B

The connection between balustrade and structural beam. Balustrade can be formed with 8mm OSB panel or tempered glass according to preference.

DETAIL C

The proposal for lighting fixture for both WC and kitchenette functions. The metal frame hang from the ceiling which allows mounting different hung styles of lighting fixtures.

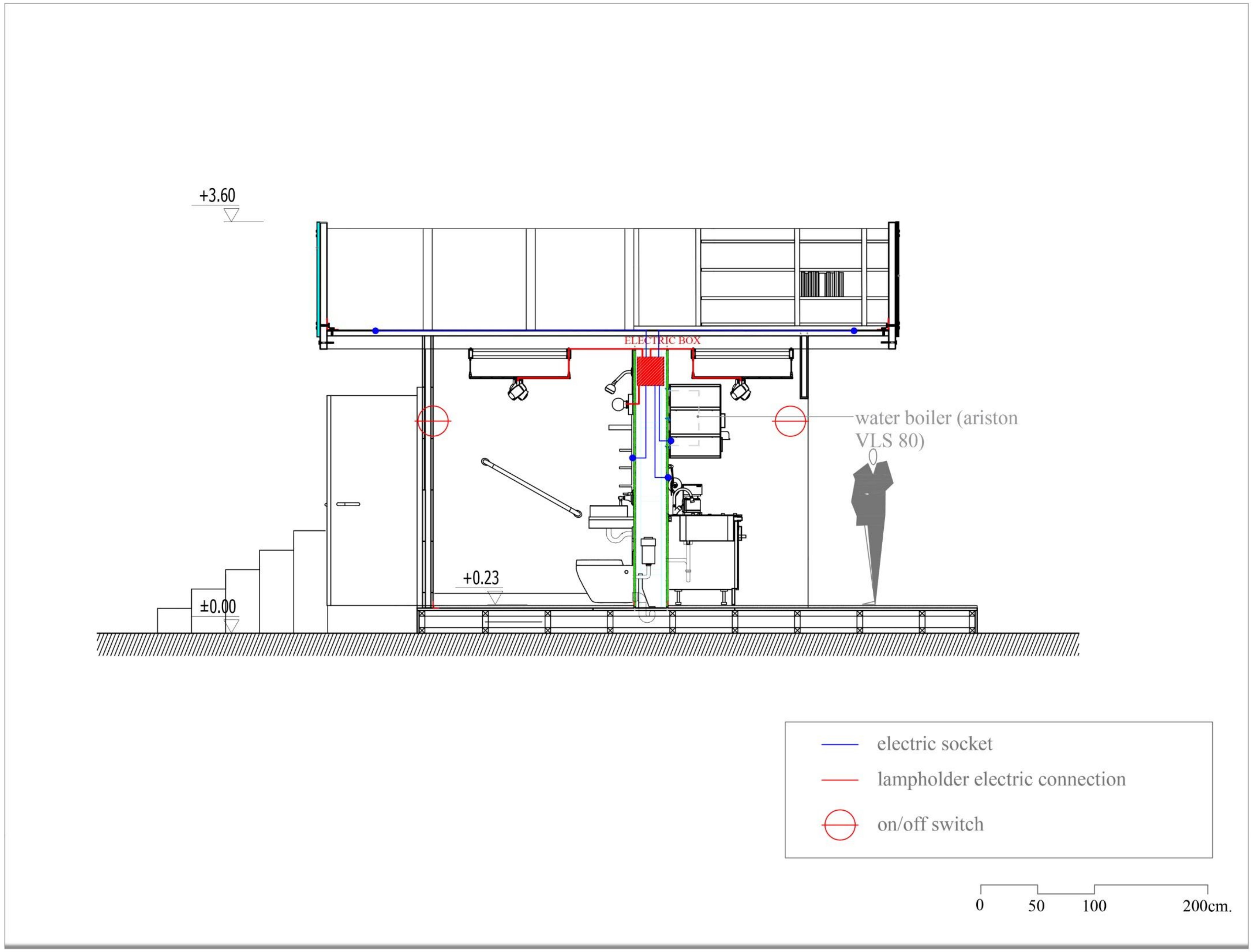

Figure 5.12 Electric Scheme Mapped in Section AA'.

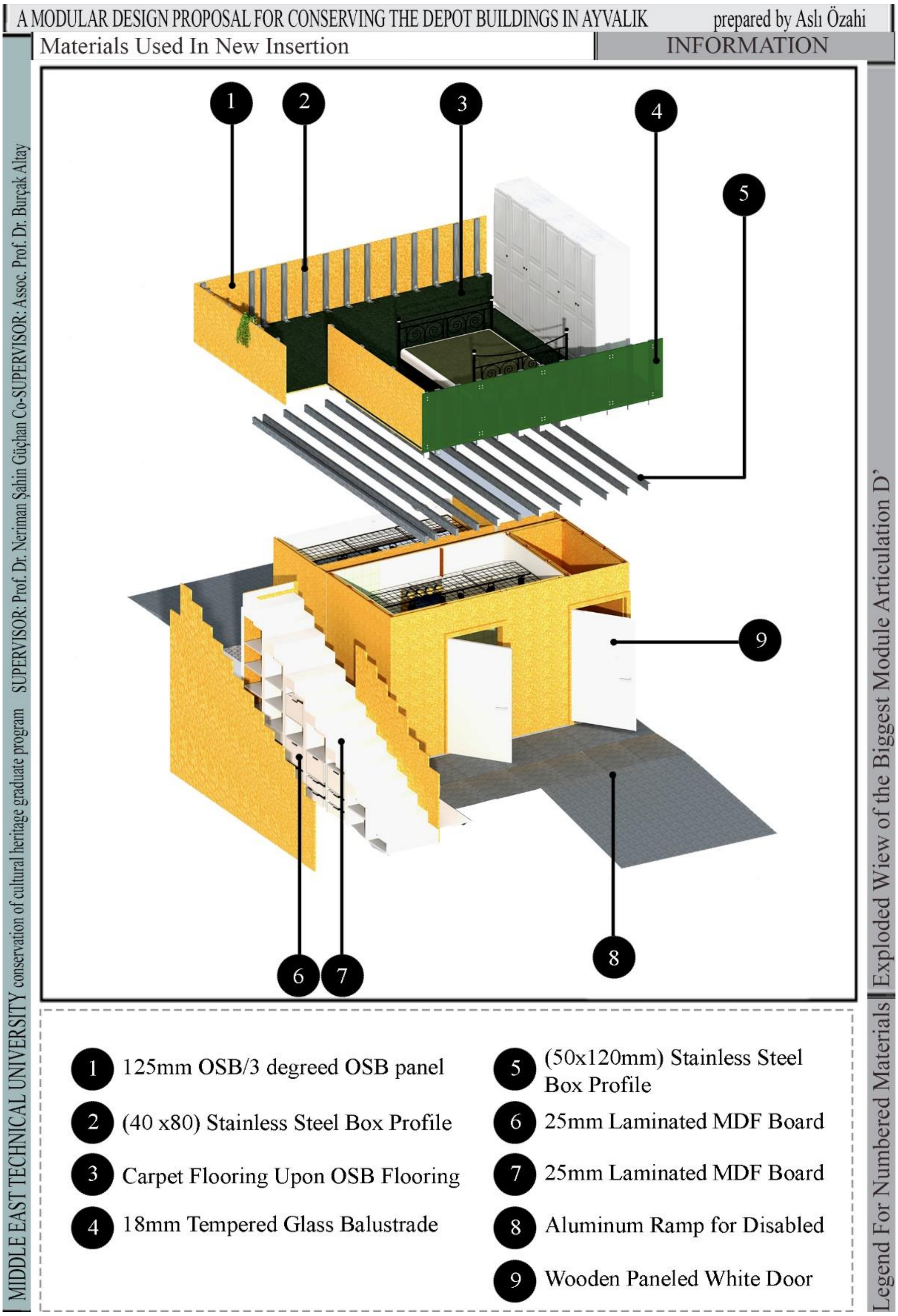

Figure 5.13. Material Board on the Exploded View of Module C.

5.4.3. Services

The services that suggested are allowing an upgraded experience of the depot buildings for users. To add a complexity layer inside the service wall and also for offering a sustainable design solution, grey water treatment has offered. This treatment can be used mostly when depot building is refunctioned with a function consist of

Figure 5.14. Rendered Section of Module C

heavy traffic of people in terms of water use. A tank for grey water collection will be installed when functions as café – bar given to depot buildings so that excessive water use will be avoided. (See details: Figure 5.9, Figure 5.10, Figure 5.11, Figure 5.12). Grey water treatment can also be used by residential users who wants to live with decreased waste. This service can advertise the module system as zero waste is becoming a popular life style among Ayvalık and Balıkesir[15]. The electric box is also located inside the service wall. In the Figure 5.12, electric scheme is mapped on the section AA'. The connection with electricity is to be made under raised floor system.

[15] Ayvalık'ta Mehmet Akif'in Öğrencilerinin Yeni Hedefi "Sıfır Atık", https://www.timeturk.com/ayvalik-ta-mehmet-akif-in-ogrencilerinin-yeni-hedefi-sifir-atik/haber-1186944 (Published on 30.8.2019),
Büyükşehir'de Sıfır Atık Dönemi http://korfezstar.com/haberdetay-buyuksehir%E2%80%99de-sifir-atik-donemi-9384 (Published on 10.07.2018)

On/Off switches will be carried to the side walls from the internal connection between service wall and side walls.

5.4.4. Sample Visuals for Module Articulations

As mentioned in above sections; flexibility and diversity in use is an important issue. It led the planning of the adaptive reuse idea to be modular and diverse. In below figures; different uses of modules for different functions of buildings tried to be shown with 3D modelling. The buildings are chosen according to their sizes and heights which shows most of the varieties of modules. The chose buildings are D01, D07 and D08. Below, first there are rendered plans of the module C for residential and office use presented. Than; one by one different functions visualizations for the selected three buildings are given.

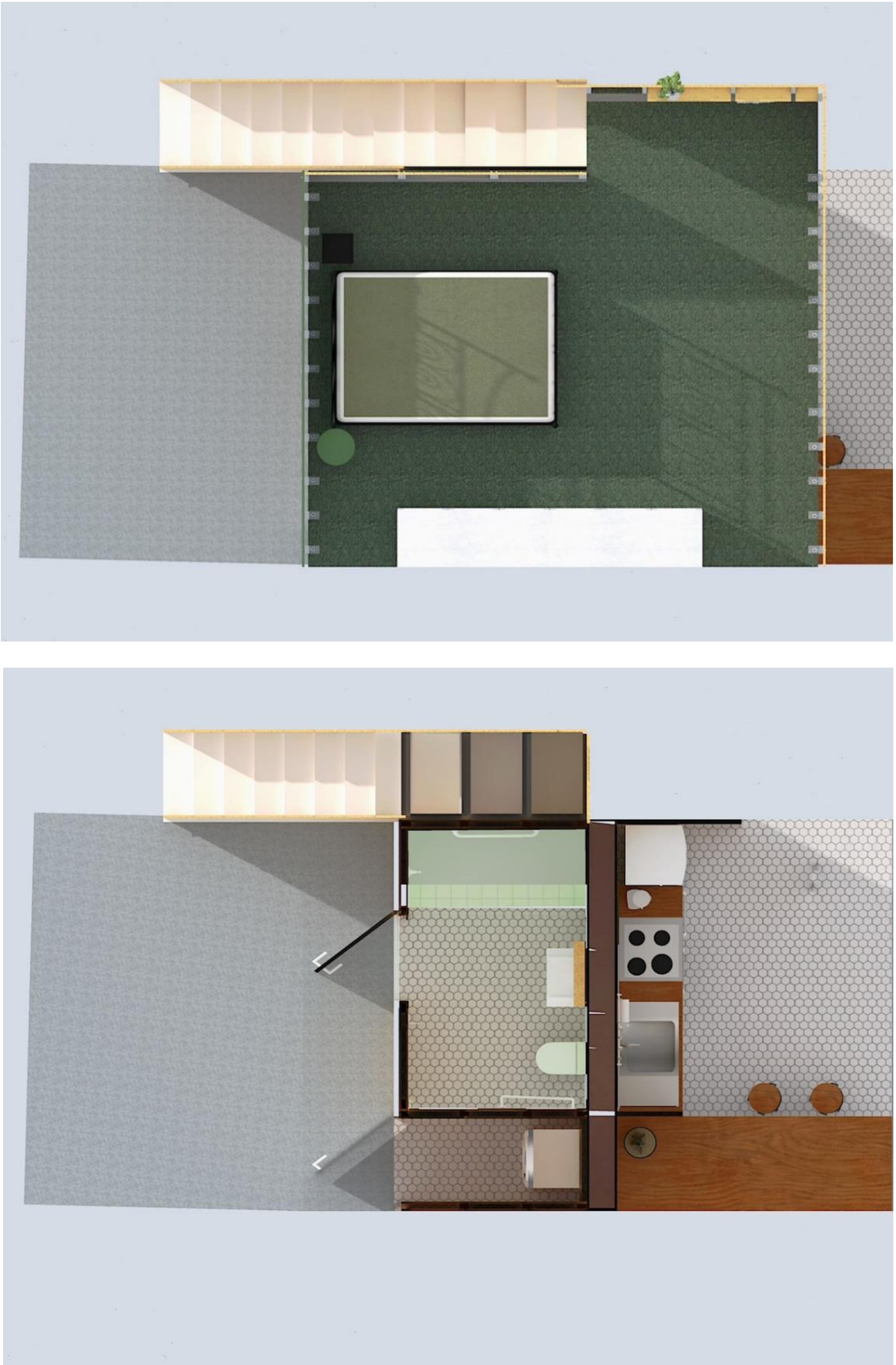

Figure 5.15. Above: Rendered Mezzanine Floor Plan of Module C in Residential Use, Below: Ground Floor Plan of Module C in Residential Use

Figure 5.16. Above: Steel Beams for Mezzanine Floor Shown in Module C, Below: Office Area Created at the Mezzanine Floor of Module D.

Figure 5.17. Module A inside D01 Cafe'S Coffee Shop

D01 Cafe'S coffee shop is one of the narrowest buildings among eight studied buildings. The Module A is suitable for this building with respect to its size. In addition, as this building has two different entrances, module divides the single space into two as semi private space and public space. The second entrance located at longitudinal side can be worked as a semi private entrance at the back of the building for staff. Area related with the front entrance can be used as public area which coffee service occurs.

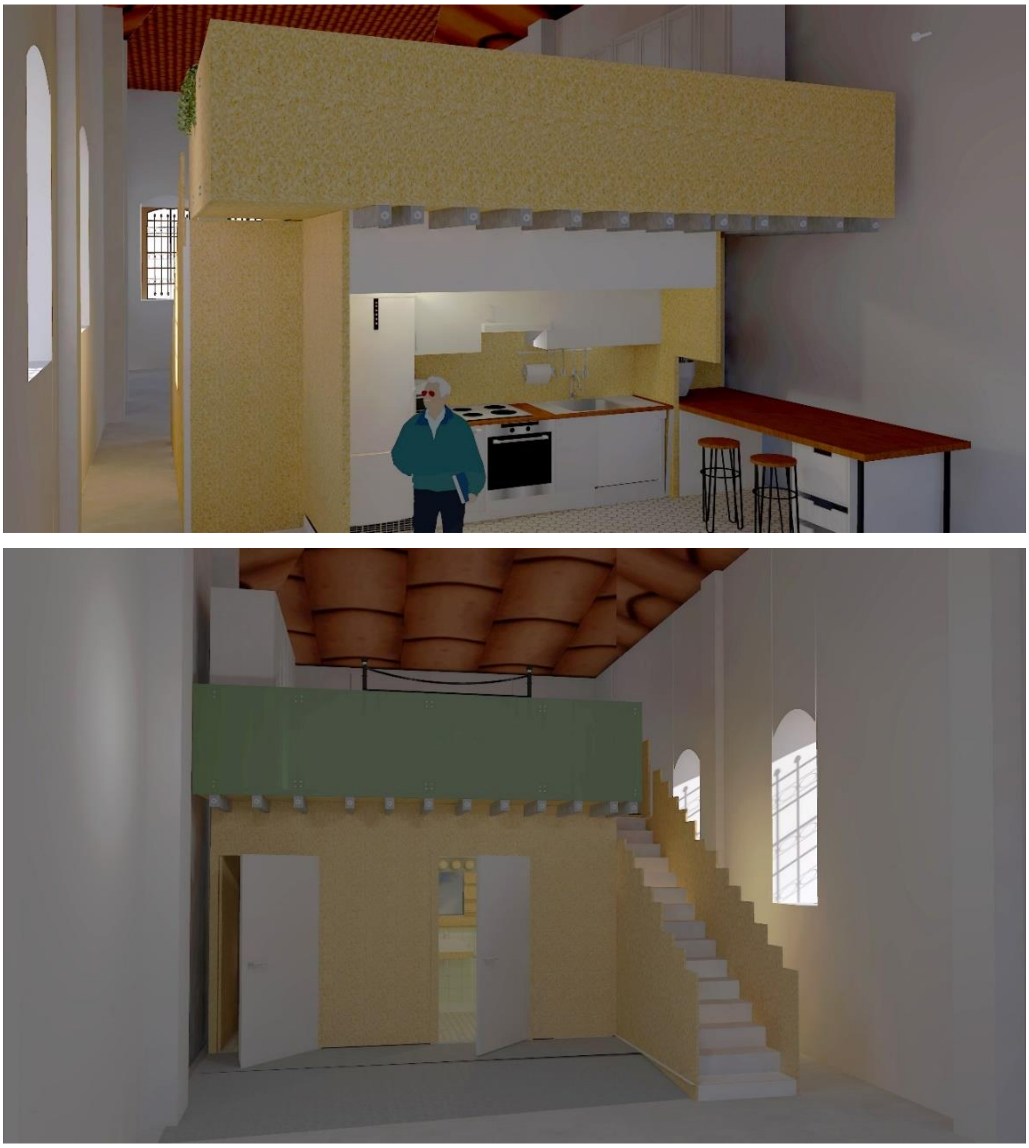

Figure 5.18 Module C inside D07 Depot Near the Seaside

D 07 has suitable height for a mezzanine floor, so it was selected to shown in 3D visuals. The building is suggested to be used in residential function for a family of 2. With loft style allocation of modules, this empty building will sustain its life to future generations.

Figure 5.19. Module C Inside D08 Depot Building Near Seaside Functioned as Café.

In Figure 5.19 Module C located inside D08 depot building near seaside. With this module allocation, the café function tried to be visualised in 3D. As seen also in above examples; the service wall always locates perpendicular to the wall. In this example it is tried to be shown that, with other decorative items; those spaces can be customized for different functions.

CHAPTER 6

CONCLUSION

Ayvalık is one of the important heritage places which also accepted to the tentative list of UNESCO world heritage list with its industrial traditional city pattern. Conservation of the architectural heritage of the ancestors who lived here and made the industrial development inside this district is a special issue to give importance to think twice. Thus, this district is one of the most studied area in literature because of its uniqueness. This also helps this study to investigate and to focus on details and move studies to one step forward.

Re-functioning industrial buildings is a common problem in Turkey and also in world. Adaptive reuse strategies which mentioned in Section 2.1 are developed in terms of increasing the use values of mostly abandoned buildings in bad conditions. Although some of those strategies intervene buildings and transform them; some of them are installed in a more respectful way, affected by the structural condition of existing industrial buildings.

In Ayvalık, selected depot buildings are outnumbered and spread through the whole traditional pattern which studies mentioned through 1987 to present. (Kabasakal Coutignies, 1987), (Terzi, 2007), (METU Graduate Program in Restoration,-REST 507-Design in Restoration 3 Studio, 2005), (Özbayar, 2014), (Yıldız, 2017), (Utta Planning, 2019) At present state; the number of traditional depot buildings decreased to fifty by years passed. (Utta Planning, 2019) Depot buildings are selected as the case study in this thesis because of their traditional beings and representing the history of industrial background of Ayvalık. They are the unique examples of being that much spread around a historic cityscape with their flexible space inside huge masses they offer. Depot buildings are historic industrial loci of the local people living there and also, they are important for being important part of Ayvalık industrial landscape pattern. It declared in Joint ICOMOS – TICCIH Principles for the Conservation of

Industrial Heritage Sites, Structures, Areas and Landscapes that; to conserve and maintain the industrial heritage structures, sites, areas and landscapes: "Appropriate original or alternative and adaptive use is the most frequent way and often the most sustainable way of ensuring the conservation of industrial heritage sites or structures. New uses should respect significant material, components and patterns of circulation and activity. Specialist skills are necessary to ensure that the heritage significance is taken into account and respected in managing the sustainable use of these industrial heritage sites and structures." (ICOMOS, 2011) Benefitted from those studies, structural and typological information of Ayvalık depot buildings are obtained. As a result of this literature study, the further step determined as understanding buildings in detail and composing a strategy for them to sustain for future generations.

At the present stage; some of the depot buildings are in use but in bad interior conditions, while others are abandoned and neglected by their owners. In addition to these; Ayvalık is one of the seaside districts which get migration from the big cities of Turkey; Istanbul, Ankara. That place is under the danger of losing its locality because of this fact. Traditional depot buildings are popular with their reusability cohesiveness. However, most of the depot buildings are observed in structurally healthy conditions which absolutely need further inspection by specialists when projects made for them to reuse. For understanding the needs of depot buildings, they are documented in detail and problems and information about the history of buildings are gained from their occupants. Documentations about their actual state with sketches and photographs are prepared accordingly.

Regarding the Ayvalık depot building case study, different case studies are examined in terms of their intervention strategies in different sizes of projects. As a result of this study, consideration of buildings as a shell structure upon a new insertion is found suitable for re-use of depot buildings which are single spaced and mostly empty buildings. Furthermore, the search of complexity in design and aim for reaching a "good design" perception, flexibility and feasibility of the intervention technique have become decisive.

Accordingly, modularity in design is suggested as a solution which provide diversity in use among different sized depot buildings. It provides easy installation and rapid result., also allows manufacture for being low-cost. In addition; diversity in use is an important issue as some of those buildings are in huge dimensions and they are already used with one or two different functions.

As a result of this all literature, conceptual and documentation studies, the analysis part starts which directly integrates with the principles to conserve traditional depot buildings and design principles of the end product. Those analysis about values, problems and potentials of buildings became the assessments. Moreover, those assessments led the end product, the “modular insertion” to act as a problem solver for the sustainability of industrial depot buildings. In that manner, as an interior architect, human needs and basic necessities for universal design are also used as a tool to achieve a design quality for diverse users of those buildings. In the end, after a multi-layered study a design product, is proposed to regenerate lives of depot buildings and sustain their heritage to future generations.

The modular designed living space proposal is one major contribution as an interior architect by the author. Modularity itself is used rather for standardization, more for enhancing a complex modular end product to offer. The contribution which tried to be achieved is the opportunity to establish a respectful design proposal to the existing depot buildings with suggested materials, given importance to user requirements and universal design principles as an interior architect. These can be considered as another major contributions of this study. With respect to these, intervening the existing building is the most important principle that effect the whole design proposal. To suggest a reversible and flexible reuse experience; modularity used as an approach. It allows a complex design solution to be prepared which can be applicable to Ayvalık depot buildings but also on other heritage buildings. The adaptive reuse strategy used is seeing the building as a shell structure upon the new insertion for different flexible uses. The functional variety this design offers can be used either residential or commercial functions. This kind of variety amplifies the quality of reused spaces that they could have more than one function with inserted design.

6.1. Suggestions for Future Research

Ayvalık has a significant number of historic industrial building stock with its olive oil factories, depot buildings and traditional residential buildings. Some of them disappeared without any documentation and some of them were damaged by the outnumbered user and function changes. The need for a comprehensive and well-thought design system for this kind of an important building stock was seen as a problem in the scope of this thesis. Although the scope of the thesis is limited with the depot buildings, this work can be done for different case studies since, most of the industrial buildings reflect similar characteristics as they were built in the same era. As the sizes and allocations of the architectural features change across buildings, it is inevitable that, every study will be unique, and change will be done for each case. Moreover, an interdisciplinary extensive study should be driven for developing the mechanical and electrical systems of the modular proposal in the scope of this thesis.

In addition to this; the structural conditions of the further studied buildings should be well-designated before the application of any adaptive reuse proposal. What is not included in the scope of this thesis is industrial buildings with different needs for refunctioning. As such, the scope may change for different needs of structures.

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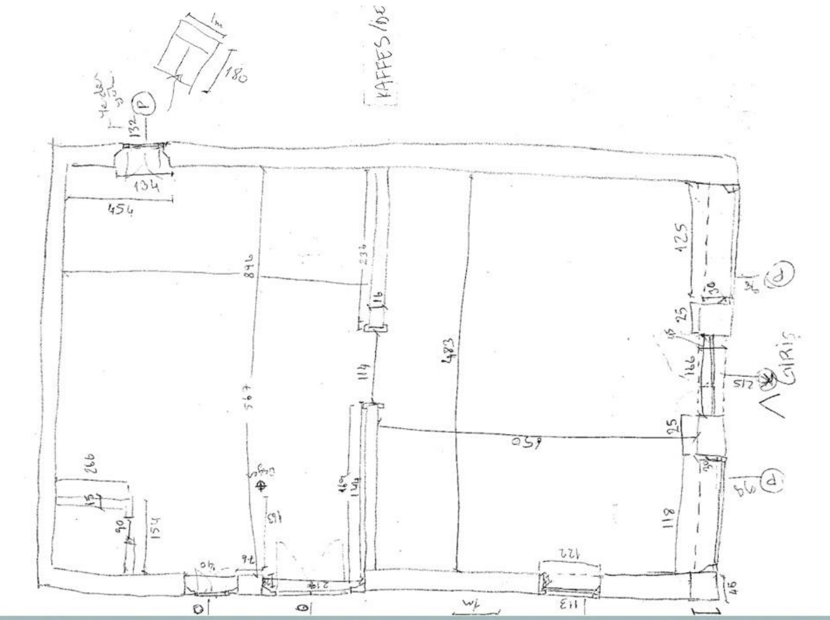
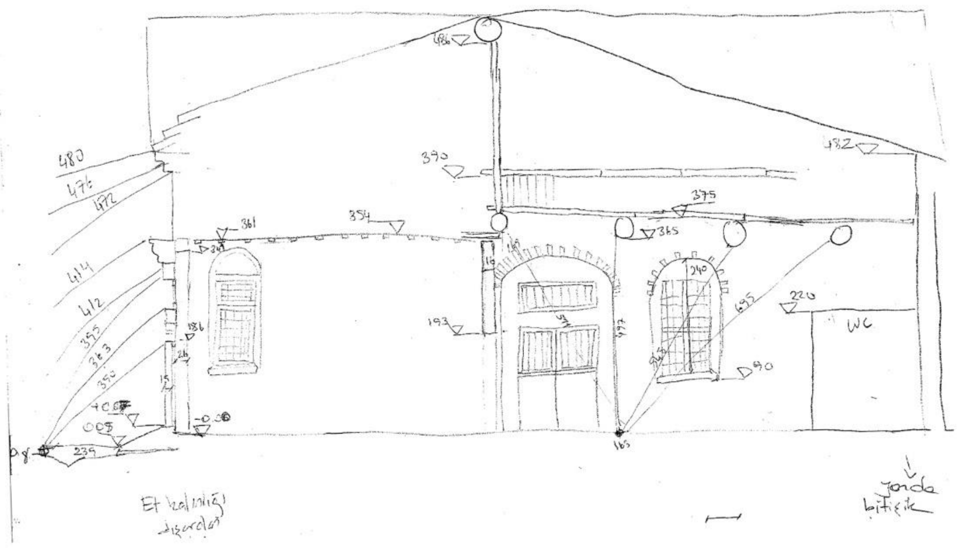
APPENDICES

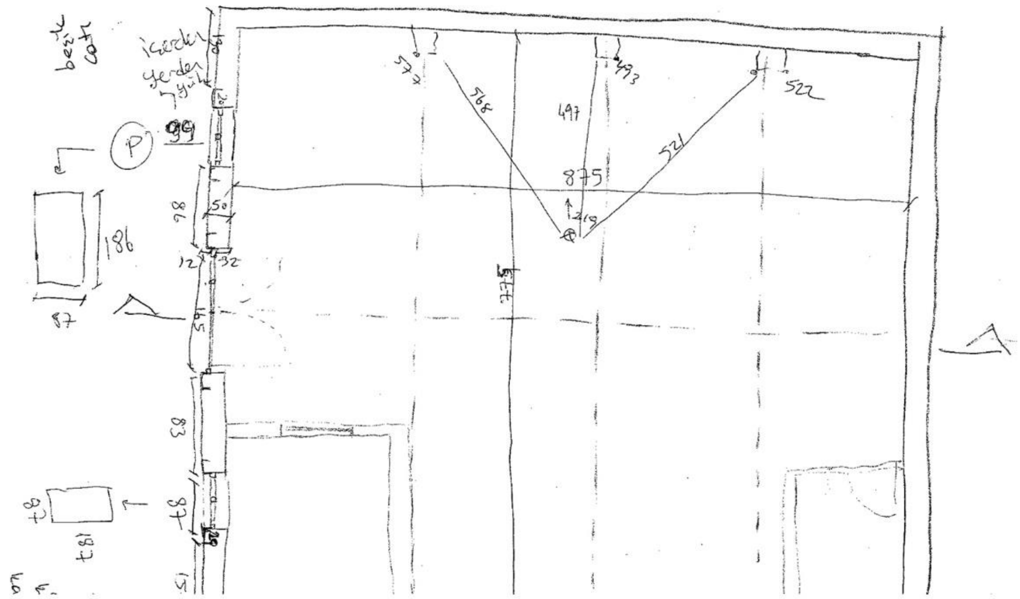
A. MEASURED SURVEY SKETCHES OF DEPOT BUILDINGS



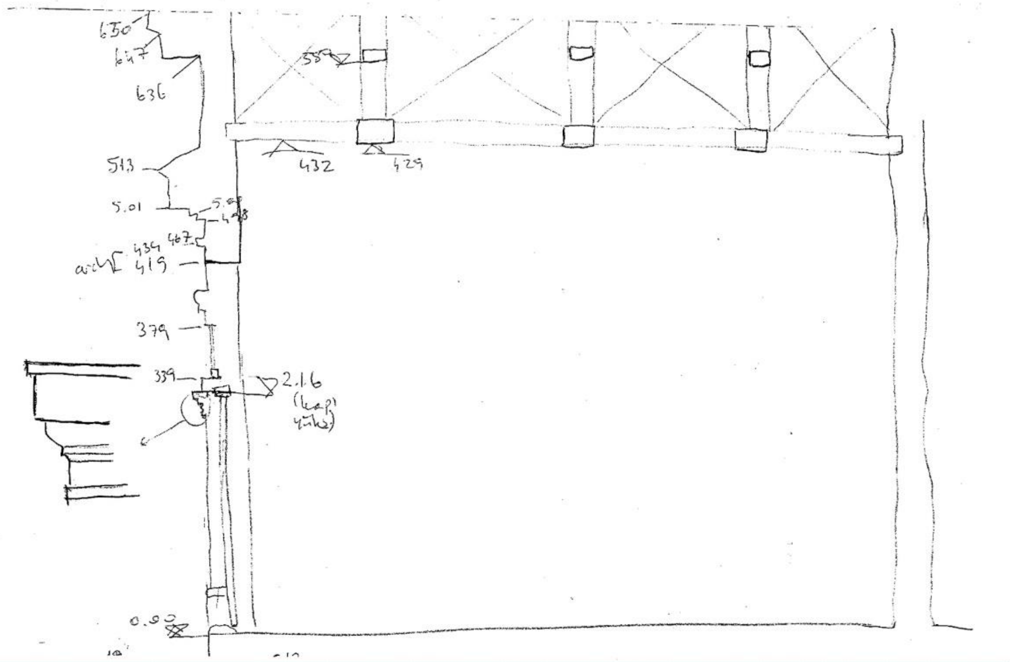
D01- Cafe'S Coffee and Antique Shop — Plan Survey Sketch



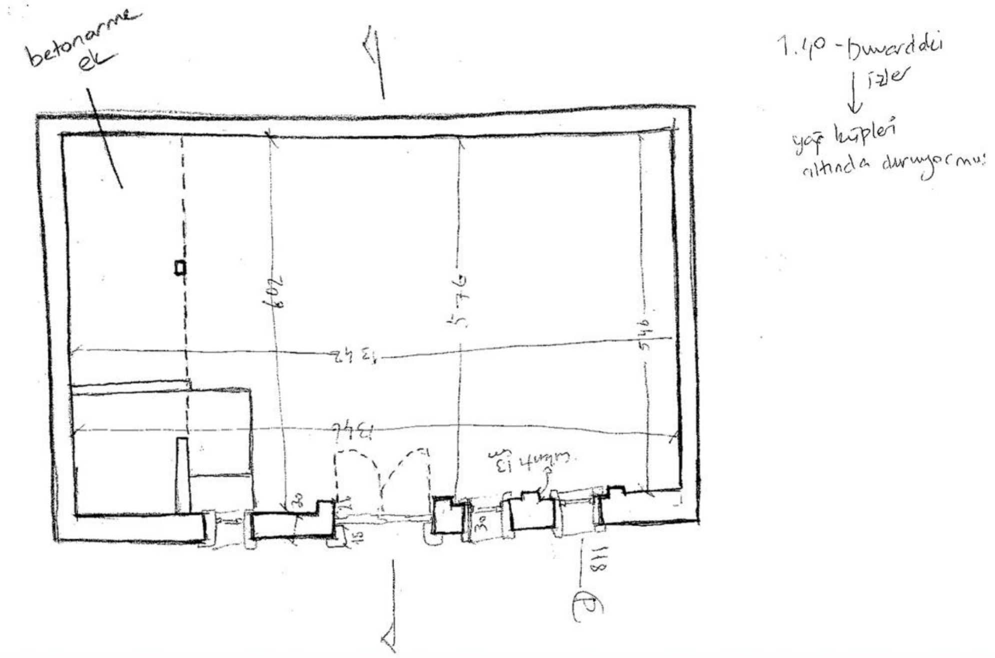
D01- Cafe'S Coffee and Antique Shop — Section AA' Survey Sketch



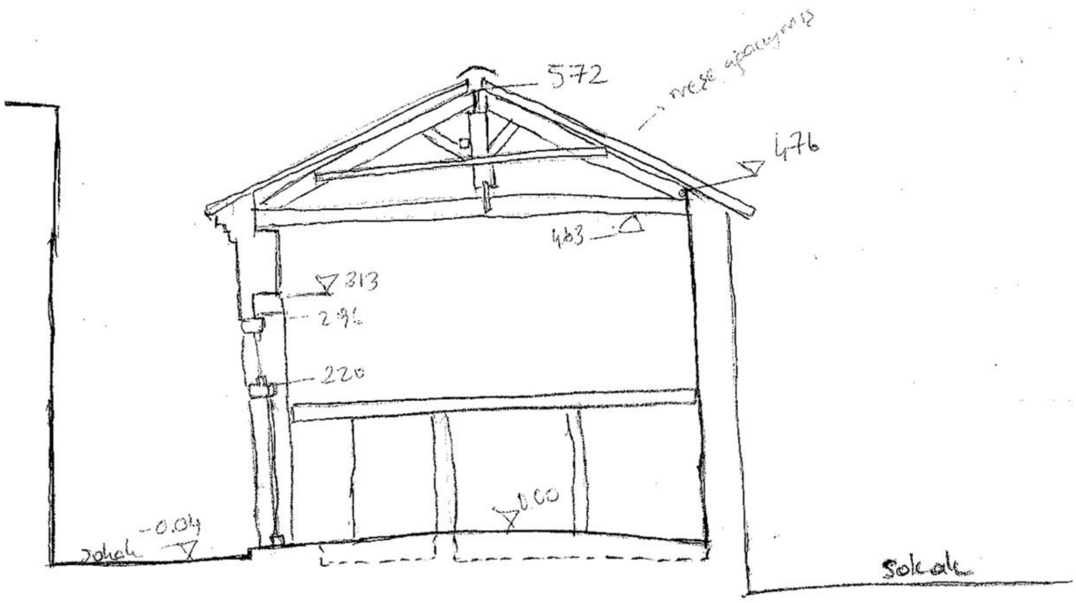
D02- A Furniture Workshop | Plan Survey Sketch



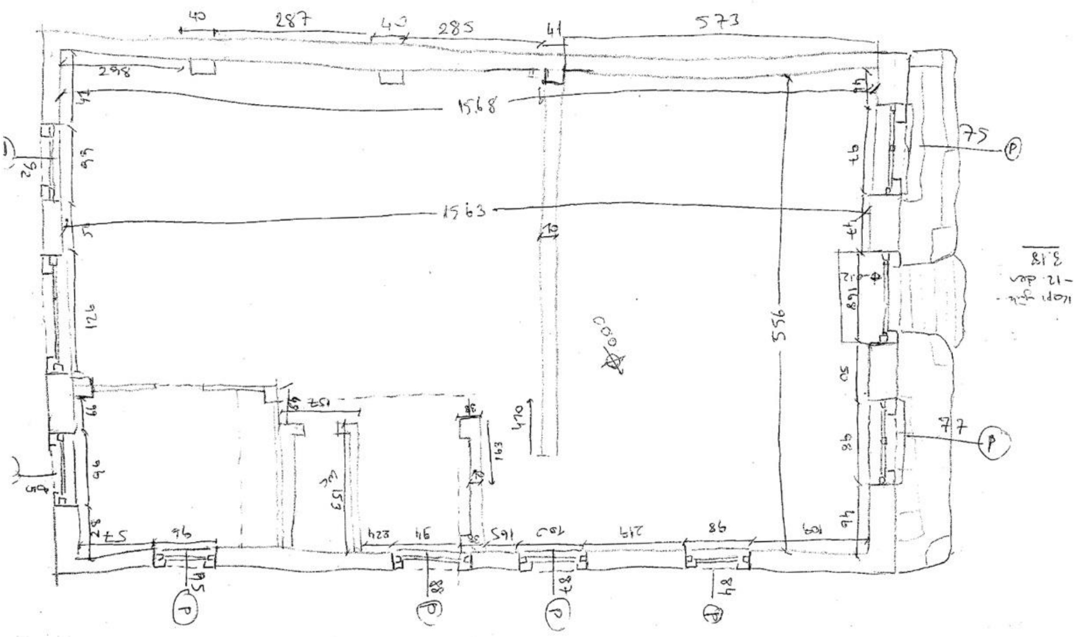
D02- A Furniture Workshop | Section AA’ Survey Sketch



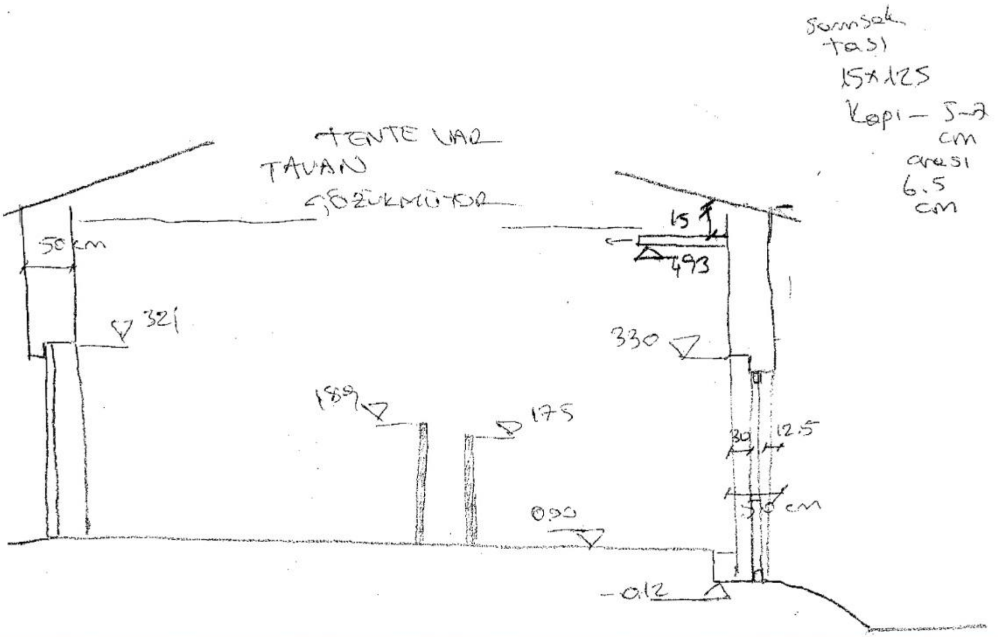
D04- Café & Bar | Plan Survey Sketch



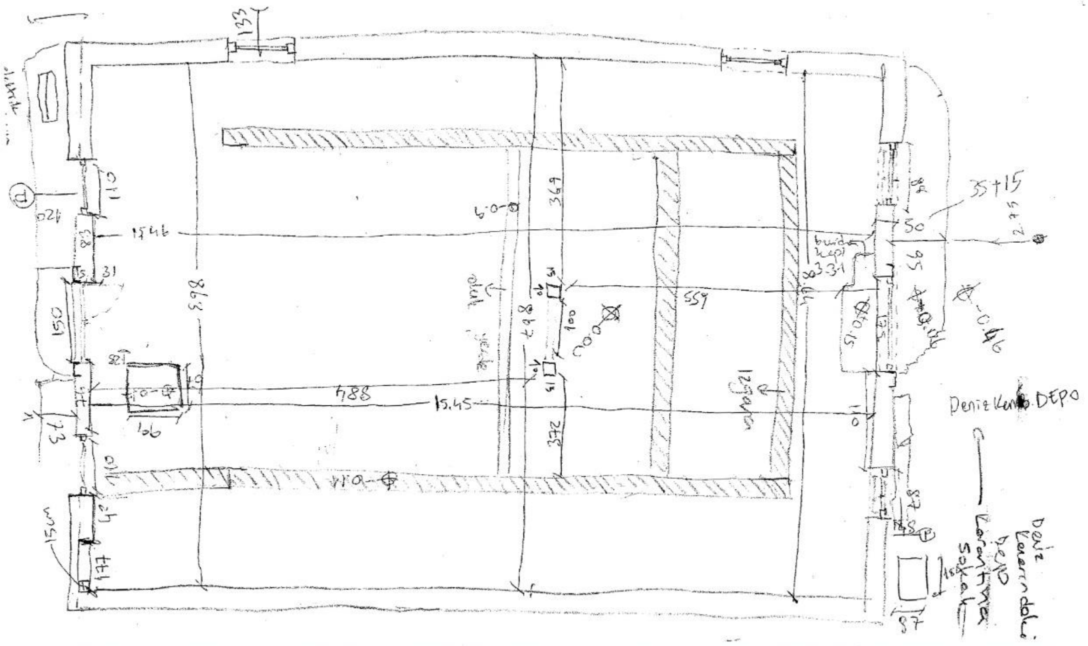
D04- Café & Bar | Section AA' Survey Sketch



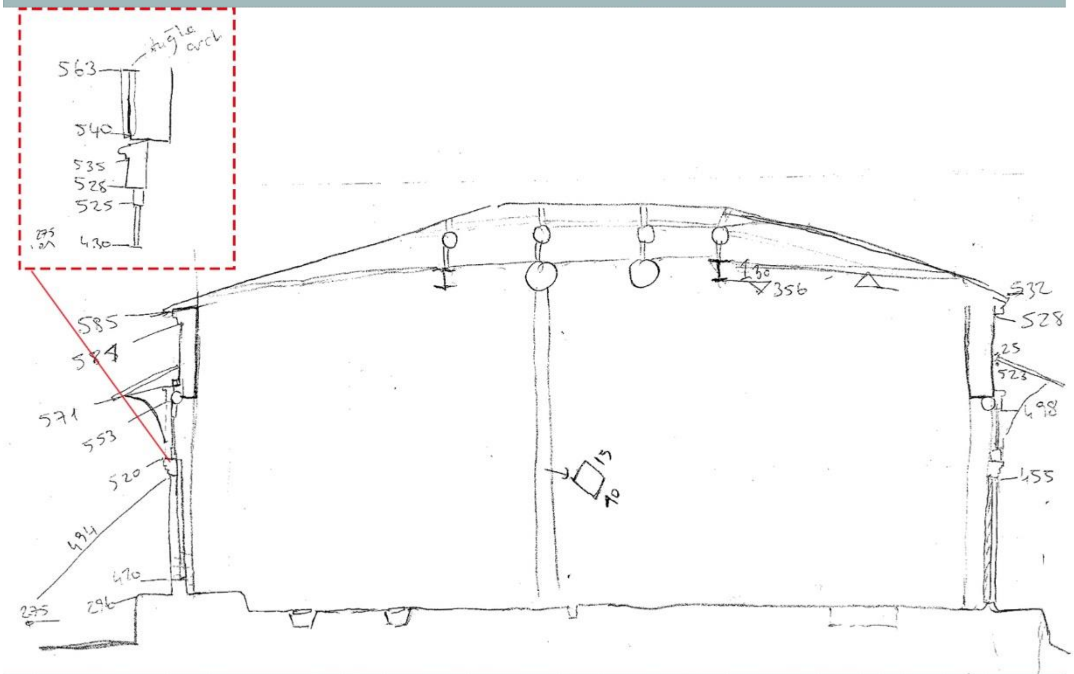
D07- Empty Depot Near Seaside 1 | Plan Survey Sketch



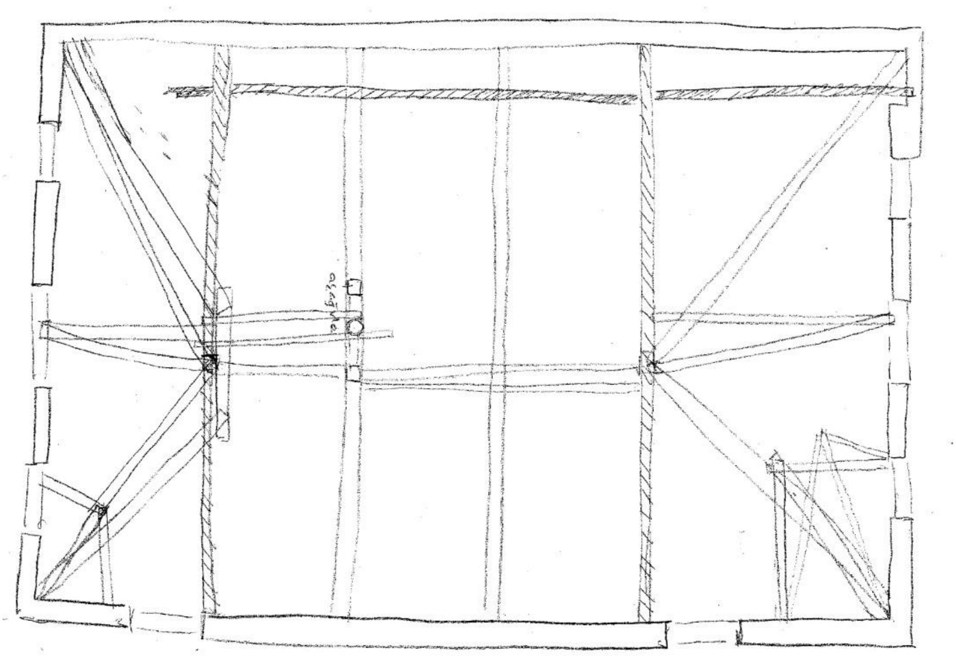
D07- Empty Depot Near Seaside 1 | Section AA' Survey Sketch



D08- Empty Depot Near Seaside 2 Plan Survey Sketch



D08- Empty Depot Near Seaside 2 Section AA' Survey Sketch



D08- Empty Depot Near Seaside 2

Reflected Ceiling Plan Survey Sketch