CONSERVATION OF SILOS AS RURAL AND INDUSTRIAL HERITAGE PLACES: PRINCIPLES FOR THE TURKISH GRAIN BOARD SILO IN ANKARA GÜVERCİNLİK

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ABSTRACT

CONSERVATION OF SILOS AS RURAL AND INDUSTRIAL HERITAGE PLACES: PRINCIPLES FOR THE TURKISH GRAIN BOARD SILO IN ANKARA GÜVERCİNLİK

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Silos of the Turkish Grain Board are monumental grain storage structures that appear as the architectural symbols of the modern period rural production. Located in Turkey's many settlements, they constitute the network of agricultural industry and storage all over the country. Starting from their rapid construction by the government during the Republican Period, these structures had helped the economic growth and modernization of the new state in terms of agricultural production and societal development. However, in today's context, many silos worldwide have started to lose their original functions due to changes in their physical and functional contexts as well as the changes in grain storage technologies. Therefore, silos are under the threat of privatization, abandonment, or demolishment, including the Güvercinlik Silo located in a dense urban center of Ankara. This thesis aims at revealing the values and significance of the Ankara Güvercinlik Silo in consideration of its context and rural network of the Turkish Grain Board. At the same time, it seeks to develop principles and strategies for the future to conserve and sustain the structure through

scenarios developed for both its original use and adaptive reuse, as it acknowledges the place as a rural and industrial heritage site.

Keywords: Rural and Industrial Heritage, Turkish Grain Board, Ankara Güvercinlik Silo, Adaptive Reuse, Conservation of Modern Heritage

ÖZ

SİLOLARIN KIRSAL VE ENDÜSTRİYEL MİRAS ALANLARI OLARAK KORUNMASI: TOPRAK MAHSULLERİ OFİSİ ANKARA GÜVERCİNLİK SİLOSU İÇİN İLKELER

Bulut, Nihan
Yüksek Lisans, Kültürel Mirası Koruma, Mimarlık
Tez Yöneticisi: Doç. Dr. Ayşe Güliz Bilgin Altınöz

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Toprak Mahsulleri Ofisi siloları, modern dönem kırsal üretiminin mimari sembolleri olarak karşımıza çıkan anıtsal tahıl depolama yapılarıdır. Türkiye'nin birçok yerleşiminde yer alan silolar, ülke genelinde tarımsal sanayi ve depolama ağını oluşturmaktadır. Cumhuriyet döneminde devlet tarafından hızlı bir şekilde inşa edilmeye başlanan bu yapılar, yeni devletin tarımsal üretim ve toplumsal kalkınma açısından ekonomik büyümesine ve modernleşmesine yardımcı olmuştur. Ancak günümüz koşullarında dünya çapında birçok silo, fiziksel ve işlevsel bağlamlarındaki değişiklikler ve tahıl depolama teknolojilerindeki değişiklikler nedeniyle orijinal işlevlerini kaybetmeye başlamıştır. Bu nedenle Ankara'nın yoğun bir kentsel merkezinde yer alan Güvercinlik Silosu da dahil olmak üzere silolar özelleştirme, terk veya yıkım tehdidi altındadır. Bu tez, Ankara Güvercinlik Silosu'nun bağlamı ve Toprak Mahsulleri Ofisi'nin kırsal ağı dikkate alınarak yapının değerlerini ve önemini ortaya koymayı amaçlamaktadır. Aynı zamanda, mekanı kırsal ve endüstriyel miras alanı olarak kabul ederek, hem orijinal kullanımı hem de

yeniden kullanımı için geliştirdiği senaryolar aracılığıyla yapının korunması ve sürdürülmesi için geleceğe yönelik ilke ve stratejiler geliştirmeyi amaçlamaktadır.

Anahtar Kelimeler: Kırsal ve Endüstriyel Miras, Toprak Mahsulleri Ofisi, Ankara Güvercinlik Silosu, Yeniden İşlevlendirme, Modern Mirası Koruma

To my mother

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ABBREVIATIONS

AFF:	Atatürk Forest Farm
TGB:	Turkish Grain Board
TMO:	Toprak Mahsulleri Ofisi (Turkish)
TOBB:	Türkiye Odalar ve Borsalar Birliği (Turkish)
SDG(s):	Sustainable Development Goal(s)
UNESCO:	The United Nations Educational, Scientific and Cultural Organization

CHAPTER 1

INTRODUCTION

Silos are products of the industrial revolution, invented for the labor-free storage of grain and many other agricultural products. However, over time, besides their primary functions, they also caused various effects in terms of architectural development and economic and social improvement of countries. Therefore, it is necessary to reveal the history and importance of silo structures to create a framework that will lead to the analysis of the thesis case.

Ankara Güvercinlik Silo is a rural and industrial modern warehouse structure that is a part of the agricultural production line in the country. The structure, located in an important business and commercial center of the capital and built on the land of Atatürk Forest Farm, cannot fulfill its initial function as before. The thesis aims to shed light on conserving the silo structure that has historical, architectural, and agricultural importance within the necessities of today's world, where people realize more how important the continuity of agricultural production and grains is.

Silos, whose structural and architectural features are mostly standard worldwide, later gained new meanings in their context. Turkish silos differ from other silos in institutional identity that is unique to Turkey and socially symbolic features relevant to the Republic period’s ideologies. Additionally, the Güvercinlik Silo has a more important place in the network of silos all over the country as the center that is set in the capital city’s historically significant rural lands.

In order to develop principles and strategies for its conservation and sustainable development, the problems of the silo should be determined, and solutions should be produced accordingly.

Figure 1.1. Turkish Grain Board Ankara Güvercinlik Silo

(Source: Turkish Grain Board Archives, 2020)

1.1 Definition of the Problem

Agricultural developments of the century and the invention of new transportation approaches changed the rural landscapes and productions. Industrial facilities, steamboats and railways, mechanization technologies, and so forth increased the trade actions and the demands from the market, which caused a necessity for a new technological approach to an ever-increasing need for agricultural storage (Landi, 2019, p. 47). The silo structures that emerged as a result of such a need spread to many places worldwide in a short time and contributed to the development of agricultural production and trade.

Silos are machine-like structures that provide huge vertical volumes for product storage. Thanks to the grain elevator system inside, it transfers the grains from the vehicle to the bins without the need for a workforce. They are industrial structures

with a much higher capacity than basic warehouse structures. They occupy less space on the ground, are safer, resistant to pests and fire, and have weighing, cleaning, and automated distribution technologies in their modern design.

Today, these monumental grain storage structures are located in Turkey's many rural and urban settlements, built next to railways, highways, and ports, just like the examples in the world. They constitute the network of the agricultural storage industry and are at the center of domestic and international agricultural product trade.

After their emergence in the last period of the Ottoman Empire by foreign enterprises, state-led silo structures in the Republican era had rapidly increased in number. Silos were seen as the structures symbolizing modernization and development in the agricultural industry of the newly established but economically poor state. They did not only provide the necessary space for large-scale storage of grain, but they also had a place in their communities' collective memory and acted as the symbols of modernization and civilization of the society (Pekin, 1938).

The problems concerning silos, including the case study, occurred in the middle of the 20th century when the usage of monumental silos started to lessen in the United States and many other developed countries (Kowsky, 2006). The reasons for this can be related to different factors. It is not that people do not produce, sell or store grain for the future. However, the dynamics between countries and the economic trends within governments have changed.

Firstly, the importance of agricultural production on the economic growth of countries in the global market has changed. During the peak of silos in the early 20th century, agricultural production was the primary source of income for many countries, and industrialization has not been spread extensively. Many conflicts, wars, and natural disasters made it necessary for communities to stock up food for the hard times. These war times also caused population and financial decrease in many settlements, forcing them to depend on a small number of agricultural resources to feed the civilians and armies. After the end of the Second World War, many countries finally found a chance to heal and focus on industrialization. At the

same time, foreign dependency on grain decreased as each country could focus on its agricultural production and did not lose the human power to work in the fields to the wars. Thus, the importance of agricultural production in global trade started to lessen and eventually left its place to industrialization and industrial production.

As a result of the post-war industrialization and the increase in the welfare levels of the countries, developments began in the cities. As the need for human power decreased with the mechanization of agriculture, the masses began to migrate from rural to urban. This caused cities to grow and the boundaries of the urban perimeters to change. As mentioned earlier, since the silos are located at the perimeters between rural and urban, they became trapped in growing cities.

Silos are structures that work with large piles of grain. These vast amounts of agricultural goods have to be carried by big vehicles. However, urban growth also causes vehicle and human traffic. It is difficult for large vehicles to find a comfortable place to move in a city's traffic, and their existence causes security hazards for other cars and pedestrians. Eventually, it becomes more optional to reduce the capacity of these structures or to disable them altogether.

Additionally, the capitalist approaches to economic development adopt the view that the state should take less part in economic affairs and transfer its place to the private sector. In this context, silos under the operation of the governments in many countries have been abandoned with the widespread capitalist understanding. They have been replaced by warehouse structures operated by the private sector. These warehouses are smaller-scale structures, and they work comparable locally instead of nationwide management through networks[1].

[1] Further details explained in Chapter 3.

Although the pace of development of these events varies from country to country, they are generally inevitable. Eventually, the silo structures will either remain abandoned or be privatized, converted, or demolished.

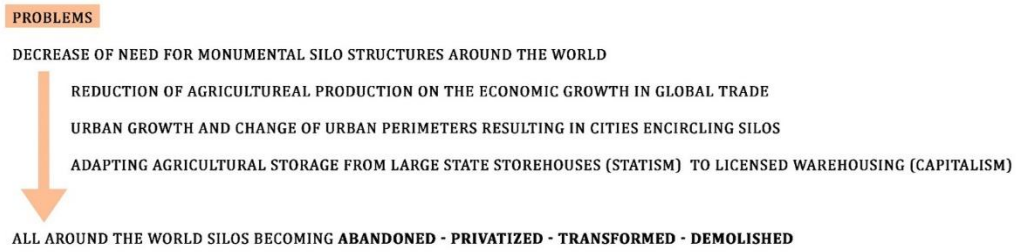


Figure 1.2. Problems highlighted (Author, 2021).

For the case of the thesis, Ankara Güvercinlik Silo, the situation is the same. The silo is still operating with ten percent of its capacity at the time of this research. However, it is expected to be out of use in the future due to the new strategic plans in agricultural storage (TMO, 2019). The structure shares the common values and problems of silos and should be conserved by considering its context's economic and socio-cultural characteristics, significant architectural qualities, and identity as a spatial representation of the Turkish Grain Board.

1.2 Aim and Scope of the Thesis

The importance of conservation studies regarding industrial heritage sites has been acknowledged in both international and Turkish platforms. But, when it comes to more specific approaches to the structures of the agriculture industry, there appears a need for more research, especially in Turkey. Because silo structures, which took on the task of leading the economic development and social change during the Republic period, are in danger of loss. The Turkish Grain Board, a national public

enterprise responsible for silos in the country, is aware of this danger and, unfortunately, is the indirect cause[2] despite genuine concerns.

The thesis aims to develop principles and strategies for the future of the Ankara Güvercinlik Silo to conserve and sustain the structure according to current conditions and contemporary needs. The silo is to be conserved together with its values by envisioning a solution in which the socio-cultural characteristics of its context and reintegration with the neighborhood are considered in unison.

For this, it is necessary to respond to existing problems with regard to the architecture and context of the silo. Understanding the place within the framework of form, material, function, location, and socio-economic aspects will lead to evaluating values and determining significance. Thus, the principles and, later, the strategies for its conservation within these principles would be achieved in this framework.

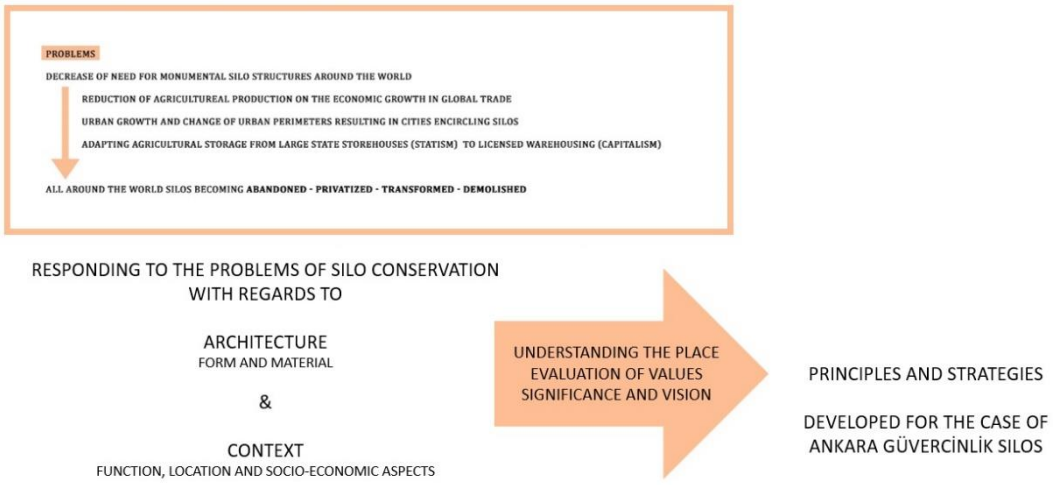


Figure 1.3. Aim of the thesis (Author, 2021).

[2] Further details explained in current context part.

In this context, the scope of the research question includes the formation of research methodology and framework for the conservation of silos. Then, as the Turkish Grain Board Ankara Güvercinlik Silo, the values and significance of its existence both as an institutional identity and as a silo structure will be studied within the research question. Furthermore, the conservation vision and decisions of the Turkish Grain Board Ankara Güvercinlik Silo can set an example for the other silos as a leading case study of the topic.

1.3 Methodology of the Thesis

The actual starting point for the topic of the thesis goes back to an official letter from the Turkish Grain Board. On the 30th of May 2018, an invitation for projects was sent to the architecture and design schools in Ankara.

The request of the Turkish Grain Board aimed to develop a new function and program for the silos in Ankara Güvercinlik[3]. The paper states that the silo cannot continue its tasks due to the reasons that were mentioned in the problem definition. In order to keep TGB's well-known “office is the farmer's friend” image consistent in people’s minds, it is thought that the Güvercinlik Silo should be preserved as architectural heritage, passed on to future generations, and also functioned as a new living space and put into the service of citizens and the Board for different activities.

The project delivery date was stated as 17th of August 2018, and there have been various deliveries. However, with the change of the general manager in September that year, the new general manager canceled this project work. Thus, the silo continues its operation, but this event have shown that the future of the silo remains somewhat uncertain because it does not have a definite strategic, management, or conservation plan if it were to become out of commission. Although the invitation

[3] A copy of the invitation for projects is in the appendix section of the thesis.

for projects was a fair approach, it is managed by one-person decisions and is expected to serve different purposes with each incoming administration.

Discussion is necessary on how this issue can be addressed proactively. How much can the silo be used with its original function is one end of the deal, but what can happen if it is to be refunctioned is the other end.

The methodology of the thesis centers around literature, archival, and site surveys. The literature survey consists of silos in a general scope, agricultural production and storage, management of grain, and rural industry. In literature survey through libraries and online sources, history of pre-silo and silo structures, architects' perspectives, symbolic influences, adaptive reuse of silos, progress and situation in Turkey were evaluated by the author's perspective on the conservation of silos. Along with these, there was also the examination of silo refunctioning examples around the world, which would be necessary for the later evaluation step. More than thirty different examples of adaptive reuse projects were examined for comparison. The examples were categorized, and three different approaches were determined for reference in the future plan.

The archival survey centered around the archives of the Turkish Grain Board. Many recent and historical sources for information on history and identity, technical drawings, official documents, photographs, maps, institutional publications, and such were obtained from the Board's archive. Where the written information lacked, assumptions and observations were made through visuals by the author. Additional to the TGB Archive, General Command of Mapping provided aerial photographs from different years between 1952 and 1999. They were used to show the changes and developments in the area and the campus in a chronological manner.

To fully understand the Güvercinlik Silo, the nationwide network and campus were also examined in these studies. However, the main focus is the silo itself. So, the network and campus will not be mentioned in detail unless it concerns the silo.

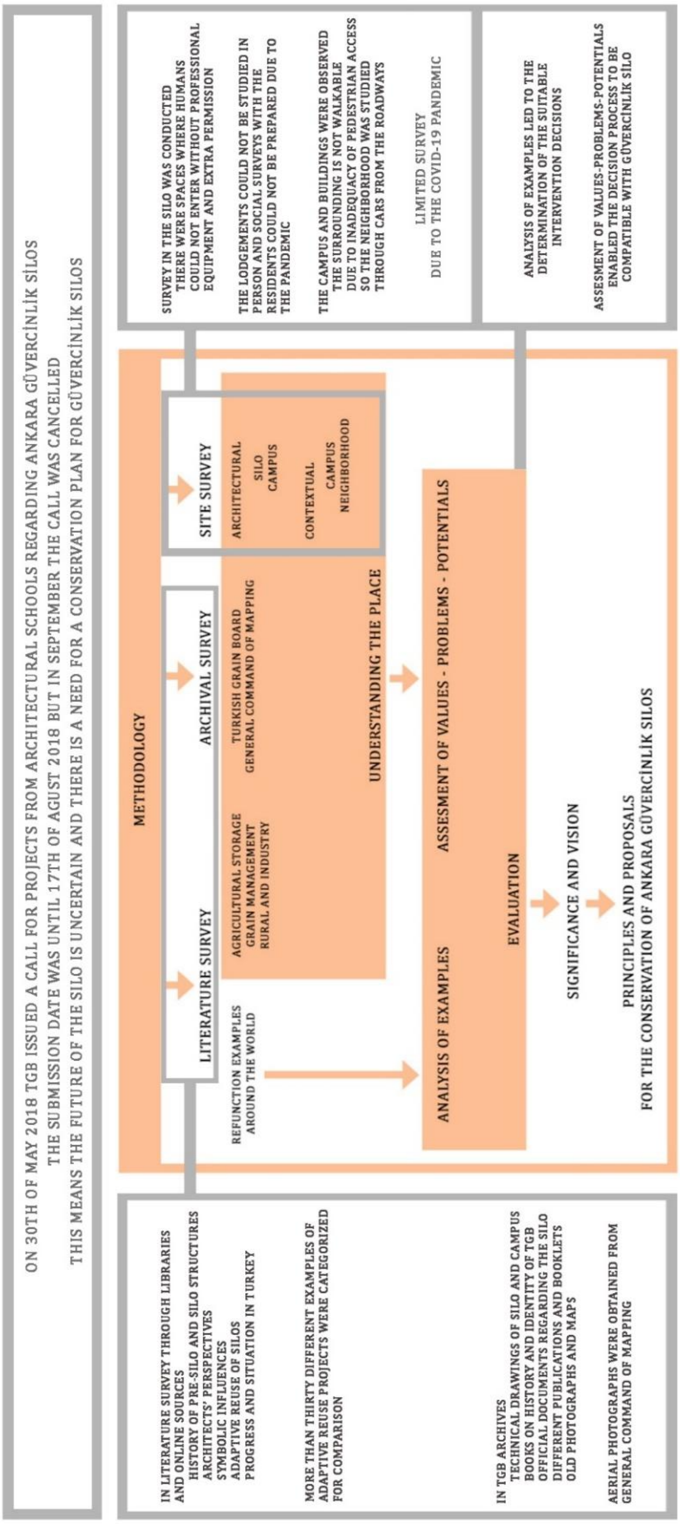


Figure 1.4. Methodology of the thesis (Author, 2021).

A site survey in the silo was conducted externally and internally on the accessible floors of the structure, but there were spaces where humans could not enter without professional equipment and special permission granted for experts.

Initially, the surveys were supposed to include many interviews with the stakeholders from TGB, residents, workers, and other experts. The campus buildings could have been studied extensively one by one, and some different silos of the network could have been visited in person for comparisons. However, due to the preventative measurements against the Covid-19 pandemic, many steps of the survey could not be fully accomplished. During the archive research, there was only one office-bearer due to the reductions in personnel numbers to decrease the spread of the virus, and it could only be visited a few times with restricted appointments. Inside the silo, only one worker and two officers accompanied the study for a short period due to time limitations. The Güvercinlik Campus and its other buildings were surveyed quickly. Especially, the lodgements could not be studied extensively, and social surveys with the residents or workers could not be done. Additionally, during the writing of the thesis, comparisons of other silos and campuses in Turkey were made, but the information was mainly taken from the online maps and sources due to the travel restrictions occurring from the Covid-19 pandemic. Meanwhile, the neighborhood was also surveyed, but the nearby surrounding is not entirely walkable due to the inadequacy of proper pedestrian access. So, the district mainly was studied through car rides from the roadways.

After the surveys, an understanding of the place would be shaped accordingly and help create an assessment of values, problems, and potentials. Together with the analysis of other examples, an approach for evaluation could occur. Determination and assessment of values and the significance that comes within create a background for developing principles and actions. Then the study moves on to the criteria and decisions that can be set for the conservation of the silo. Therefore, the formation of the content and subject flow of the thesis is essential in the methodology phase.

Firstly, background information on the history of agriculture and the need to store produced goods for preservation and trade purposes, regarding its significance on their communities, must be understood. Primitive and simplistic examples of storage, such as the use of caves and single space warehouses followed by more culturally defined models, exist for experts to understand the link between usage and space creation accordingly. Additional to the methods seen around the world, the focus will shift to Turkey's grain storage systems in history from the Ottoman Period to the Republic as a case study of an early agricultural network system. With the arrival of the Industrial Revolution, the invention and implementation of the grain elevator and its impact on the grain industry became life-changing. The introduction of reinforced concrete in the engineering field and its potential for new structural means in storage spaces made it possible to create the silos that people had come to know and use today.

Later in Turkey, these new silo structures were introduced. The new republic's establishment and new policies in terms of economic development and growth, the role of agriculture in that aspect, modernization of agricultural development, and the industrialization of this production process during that time will be informed in the light of new ideologies together with the current condition of the state and its people of that time. As the republic built new reinforced concrete silos, their relations with their neighbor area, city, and the other silos they connect and create a system through the transportation network are significant steps for a totalitarian approach in future decisions.

In addition to all this information regarding silos history, it is necessary to talk about the direct effects of silos and, in particular, reinforced concrete silos on the development of modern architecture. Its impact on new building techniques in terms of material, form, and scale, followed by the impact on urban growth and socio-cultural changes, are all interrelated and crucial to mention. After regarding historical and architectural aspects of silos, it is essential to discuss the different takes on approaching conservation of silos worldwide. The methods of approaching silo conservations should be analyzed in their context and then compared by how they

are perceived and valued in terms of architecture, socio-culture, economy, and ideology. This determination will be helpful for conservation decisions later on. As a result of all these, silos should be evaluated in a new framework dedicated to determining general values of rural industrial heritage to conserve. After the general aspects of silos, Ankara Güvercinlik Silos and the Turkish Grain Board should be examined as the scope shifts to the case.

With the ever-increasing number of silos and the network they create, there was a need for a new institution to handle the complications of agricultural production. Thus, the Turkish Grain Board's establishment as one of the modern state's oldest and biggest economic enterprises is vital during the historical development of Turkey's grain storage. The board’s economic and social visions and its many benefits for the public are essential to consider while understanding these developments. The network system expanded under the TGB is briefly examined within the limits of the thesis’ scope. Knowledge of the organization schema of the regions, work hierarchy within the network, and the condition of silos with similar status are beneficial for understanding the historical, operational, social, and architectural aspects of the Güvercinlik Silo. Then when it comes to the silo scale, discussions of the location and site characteristics of the silo and its campus, auxiliary buildings and aspects of the campus, architectural and spatial features of the silo, and the working mechanisms in both scales are crucial to conducting this study.

Moreover, the current context of the silo, campus, and the neighborhood needs to be acknowledged to determine values, problems, and potentials. The thesis tries to reveal the degree of change in the existing silo, built environment, movement, and spatial flow, social structure, the spirit of place and operational process within the frame of causes and consequences in order to understand the need for new storage methods in the field and the reasons behind the abandonment of silos.

After all, based on a comprehensive understanding and assessment of the silo in different scales, conservation principles and strategies are defined for the future of the Turkish Grain Board Ankara Güvercinlik Silo.

CHAPTER 2

CONCEPTUAL FRAMEWORK: HISTORICAL BACKGROUND OF SILOS AND REFRAMING THEIR CONSERVATION

In this chapter, the conceptual framework of the thesis focuses on understanding cultural heritage and its significance within the context of rural and industrial assets called silos. In order to understand the reasoning behind its conservation and build a framework for this purpose, there should be a comprehensive analysis of the brief history of agricultural production, the invention of silos, social and economic impacts on the countries, and the perceptions within architecture.

In addition to these, it is necessary to look at how the existing silo structures are handled on the basis of heritage conservation and how they are reintegrated into urban life when they are out of use in order to determine future approaches.

All these studies' outcomes will lead to reframing the conservation of silos through the intersection of existing keywords and concepts. Thus, the determination of common values can be achieved and utilized for the evaluation of Ankara Güvercinlik Silos.

2.1 History of Agricultural Storage Means and Silos

During the Paleolithic age, humans who lived as small hunter-gatherer groups began to eat wild grains and fruits alongside the animals they hunted due to the world's climate getting warmer. They met with these wild grains around 20.000 years ago. Thus, a very primitive agricultural production of these wild grains emerged. Since it was easy to produce, store, and take nourishment from these grains, it soon became a popular food among human groups (Mukul, 2007, p. 19).

Following these events, the Neolithic Revolution came with developments in agricultural production. Along with agriculture, humanity went through a massive shift in terms of social and economic development. Humans started to settle along the riversides for better opportunities in agricultural production and shelter. These places were already suitable for hunter-gatherer communities, but they also allowed people to develop into settled agricultural communities. As small groups started to get together, they exchanged information and new technologies among themselves. Thus, these early communities began to advance in various sciences like math, astronomy, medicine, and chemistry. Later they exchanged these sorts of information as they interacted with other communities while trading each other. Agricultural goods were an important commodity. People were also making the necessary equipment and structures upon a share of knowledge and discovery. Agricultural production led people to stay in a place and adopt a sedentary life because of the time spent planting and harvesting grains. The processes in between led people to settle down and thus eventually led them to construct shelters for residence and built farms in designated places (Yıldırım, 2019, p. 15).

Dependence on food production and its consequence on settlement decisions led to the creation of civilizations.

During the process of becoming civilized, humanity took a big step with the invention of agriculture. People started to settle in one place and produce agricultural goods, which led them to become civilized once they began to store their products for future consumption or give them away to other consumers in exchange for other necessities (İnan, 1972, p. 5).

Sharing of tasks, the start of trade, works and masterships related to different fields, management issues in various scales, and protection of all seem to be a result of this cause. People formed governments, states, social and economic classes of farmers, traders, soldiers, and many other groups from the very act of agricultural production.

2.1.1 Grain Storage and Architecture of Pre-Silo Structures

Harvested agricultural products would be stacked in large quantities as the fields expanded over the lands. Some of it would be consumed immediately by the community, but the majority of the product would have to be preserved in safe enclosed spaces.

Throughout the ages, the need to create spaces for the storage of agricultural products has led to the creation of various spaces that differ according to the differences in culture, features of the produced goods, available construction materials, and economic power. These storage spaces were seen as a closed shelter against climatic factors or other external threats and spaces where people could stack the agricultural goods in an organized and measured way for future trade and even distribution. Furthermore, the agricultural goods stored in designated spaces could be protected easily by civilizations and the states and armies they formed.

The typology of the grain storage space depended not only on natural factors like climate, topography, and environment but also on the social, cultural, economic, religious, and political aspects of the communities that designed them. From very simplistic pits to large-scale fortified structures, the grain's storage and protection were significant for their communities.

Going back in time, there were several practices to keep the grain safe from several hazards. During the archaeological excavations for the Hittite civilization in the Büyükkaya region, archaeologists discovered underground grain silos of various sizes dating back to the 13th century BC. These underground structures were consisted of cells around 6 meters in a large rectangular frame of 118 meters to 30-40 meters, reaching a stepped depth of 15 meters. This structure's capacity could approximately hold 7000 m3 grain or 4200 to 5900 tons of grain, which can feed up to 23.000-32.000 people in a year. The way these silos work protected the buried grain from hazardous insects and weather conditions. Inside these pits, the bugs and such livings that reside within the grain would die due to lack of oxygen and later

released gases that would keep other creatures away. Meanwhile, the grain would stay fresh due to these gases and lack of oxygen (Seeher, 1999, p. 303-305).

The storehouses' construction material or methodology also varied extensively through history, from stones and timbers to rock formations and underground pits. In Taşkale, Karaman, a rock formation around 40 meters tall, had 251 caves which the local community used to protect and store the granaries in the Post-Byzantine period. Their depth varied between 5 to 10 meters, and the storage capacity went up to 60 tons. These spaces were high above the ground level, and the people used to climb up the wall with the help of small carved holes called *tutamak*. They came up with pulley systems to carry the grain and lifted the products to the upper elevations to store and protect for many years (Asrav, 2015, p. 105).

Figure 2.1. Images showing usage of caves for the storage of agricultural goods in Karaman Taşkale. (Source: Yıldırım, S. 2019. Toprak Mahsulleri Ofisi tarihçesi 1938-2018. Neyir Publishing: Ankara, Turkey. 23)

In Anatolia, many more different examples of other storage spaces existed. In both the Teke Peninsula and the Black Sea Region, south and north regions of Anatolia, the use of timber becomes apparent. The storehouses are timber constructions that are traditionally placed in an interlaced manner and without using nails. The use of

cedar trees in the South kept insects away because of their smell; meanwhile, the structures called *serender* in the Black Sea Region were elevated from the ground and could only be reached with ladders. The use of timber also provided air circulation to keep the products fresh, and the unwanted insects were unable to climb the tall capped columns of the storage space (Yıldırım, 2019, p. 23-24).

The typology of the grain storage space depended not only on natural factors like climate, topography, and environment but also on the social, cultural, economic, religious, and political aspects of the communities that designed them. From very simplistic pits to large-scale fortified structures, the grain's storage and protection were significant for their communities. One example of these concerns is that in Europe, masonry structures named *granges* appeared following the monastic orders starting from the 12th century. Some of these structures were surrounded by fortifications for protection, which indicates that people were willing to take extra measures to ensure the safety of these goods (Giuliani et al., 2018, p. 2).

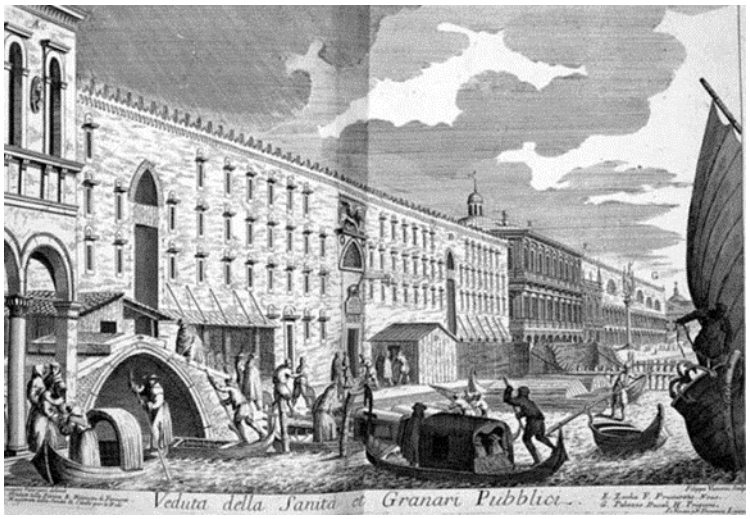


Figure 2.2. Filippo Vasconi's "Veduta della Sanita et Granari Pubblici" Public granaries in Venice

(Source: Erkal, N. (2020). Reserved Abundance: State Granaries of Early Modern Istanbul. Journal of the Society of Architectural Historians, 79, 1, 18)

Aside from the places of storage, people also had to deal with the issue of food provisioning and expanding the storage means due to the frequently occurring cold weather, food shortage, and famines. Many states built public granaries in their settlements to withstand these outcomes and keep a closer eye on the goods, varying from monumental structures with sophisticated architecture to modest ones.

In Europe, there had been many examples of monumental granaries built at city squares whose architecture did not differ from other prominent public buildings. Similar to other building types, monumentality and architectural trends of their times reflected on the storehouses as well. Later that period, some of the granaries were even designed by famous architects to appear glorious in public squares. Meanwhile, vernacular solutions and influences on architecture in European colonies were prominent for the granary structures (Erkal, 2020, p. 17). They could blend with their surroundings, and it was easy to reach and protect them in this way.

In less developed settlements, another approach for grain storage was the use of old and abandoned buildings to store agricultural goods. This showed that the management of these issues was somewhat out of date, unhygienic, less guarded, irregular, and even unscheduled. All these existing methods would never be enough or efficient to advance further in agricultural management.

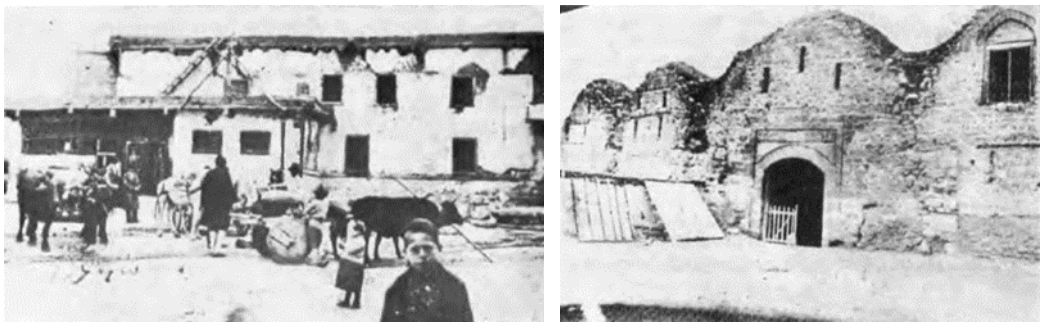


Figure 2.3. Photographs showing old storage conditions in underdeveloped parts of Anatolia

(Source: Toprak Mahsulleri Ofisi Genel Müdürlüğü. (1968). Toprak Mahsulleri Ofisi 30. Hizmet yılı 1938-1968, Ankara: Toprak Mahsulleri Ofisi)

The situation in Anatolia was more or less varied depending on the communities and their vernacular solutions of caves, timber, or masonry structures, as mentioned previously. However, the Ottoman Empire's metropolitan capital, İstanbul, required more well-thought solutions regarding the provisioning and management of grain for the large population.

Storage and Trade Centers of Istanbul in Ottoman Period: Kapan

During the Ottoman Period, the storage of agricultural goods and their supply from rural to urban centers were supervised by the state, who had control over the wholesale trade formed by the organization of the markets specialized in different products. These market places, called *kapans,* named after the public weighing scales, were the official distribution centers for varying goods. In these places, the goods would be measured, checked by their quality, and registered; then, they would be stored for a while until they departed. These facilities did not have an architectural typology. They looked like any regular public building from the outside, and they were placed in market squares by the city gates or near service structures. Among several kapans, Unkapanı stuck out as a facility responsible for grain distribution, trade, and storage. Constructed in the early 16th century and located at the harbor of the capital city, this place and its neighborhood became the primary center for the grain trade (Erkal, 2018, pp. 351-355).

Food security and control were critical topics for the empire, just like many other settlements from various periods. The government took a role in storing the grain and kept them at public places in city centers where it would be secure. The most important aspect of these structures was to ensure that there would always be enough space for food in case of famines, fires, and such hazards. The architectural solutions of these structures also focused on the prevention of physical damage or rotting. Due to the struggles of cold weather during the Little Ice Age, the supply of grain in many countries was at risk, and states worldwide took it upon themselves to deal with the storage of large quantities of grain (Erkal, 2020, pp. 17-38).

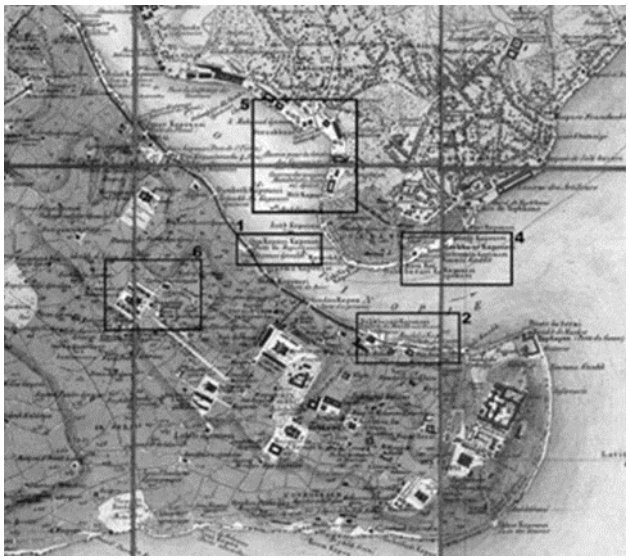


Figure 2.4. Cropped map of Istanbul from 1836, with locations of state granaries, number 1 at the center being Unkapanı

(Source: J. J. Hellert, Nouvel atlas physique politique et historique de l'Empire Ottoman et de ses etat [Paris: Bellizard, Dufour et Cie, 1844] retrieved from Erkal, N. (2020). Reserved Abundance: State Granaries of Early Modern Istanbul. Journal of the Society of Architectural Historians, 79, 1, 17-38.)

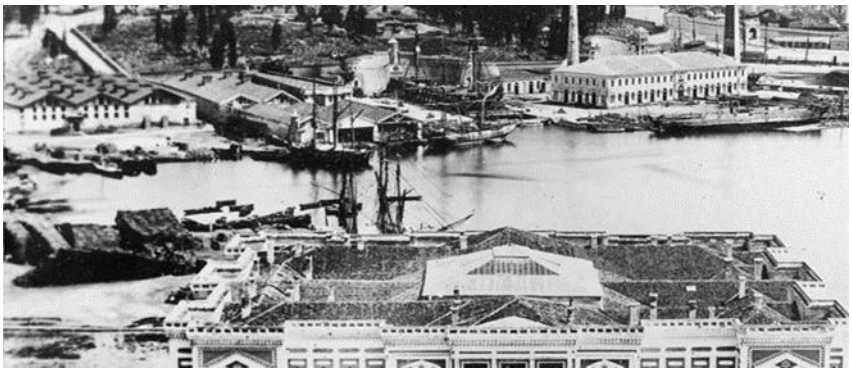


Figure 2.5. Istanbul, 1860s, granaries at the top left of the image.

(Source: Stereograph image, Ömer M. Koç Collection, Istanbul retrieved from Erkal, N. (2020). Reserved Abundance: State Granaries of Early Modern Istanbul. Journal of the Society of Architectural Historians, 79, 1, 17-38.)

Storage buildings of that time had thick walls, small openings, and hipped roofs. Between the 15th and 18th centuries, there was no architectural typology for these buildings. Therefore, it was hard to differentiate them from other public buildings, just like European examples. However, in the 18th century, these structures' architecture was standardized as the government started to control grain management firmly. In the late 18th century, grain provisioning was institutionalized, with the first modern Ottoman ministry's establishment: Grain Inspectorate (Zahire Nezareti). Later, Grain Treasury (Zahire Hazinesi) was added to the institutions for monetary affairs. Grain Inspectorate took action to increase the number of stored goods. Alongside new warehouse constructions, conversions of fort structures and ship sheds to granaries occurred. Also, the Grain Inspectorate's excess profit was started to be used for further reforms and inherently gained utmost importance (Erkal, 2020, 17-38).

For the management and protection of agricultural products, kapans emerged as a unique and national method that has been beneficial to the empire. Under the control of the central authority, the needs of the metropolitan people were met, and additional economic contributions were made to the country, which simultaneously contributed to the imperial power through reforms funded by kapans. Meanwhile, conversions of different buildings show the need for grain was greater than what was initially planned, but it also indicates that grain storage spaces have always been flexible spaces that could be converted back and forth depending on the needs, as long as it has large spaces with enveloping exterior walls and minimal openings.

Until the late 19th and early 20th centuries, the new technology of silos did not arrive in Anatolia. The first built silos were Derince Storehouse in İzmit (1897) and Haydarpaşa Silos in İstanbul (1904-1907). Unlike the kapans, these structures were constructed and managed by foreign firms. However, their lifespans were short-lived as the Haydarpaşa Silos took damage after an explosion in 1917 and became

unusable later on, while the Derince Storehouse was already abandoned at that time (Pekin, 1938, p. 9).

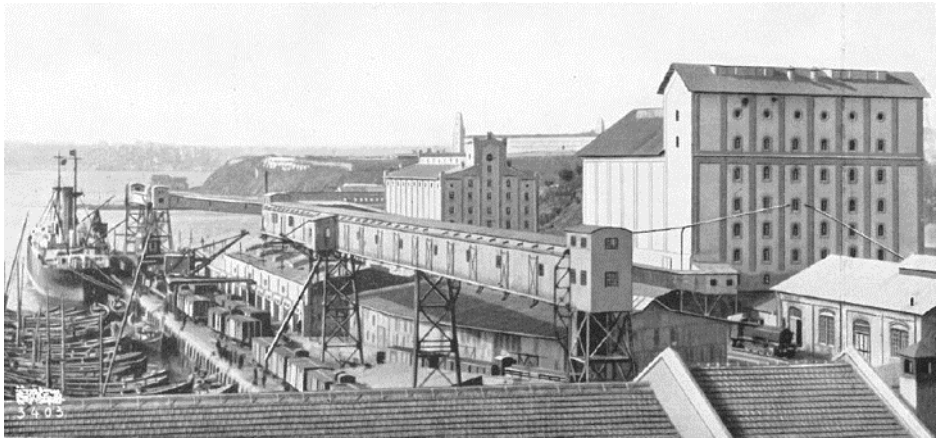


Figure 2.6. Haydarpaşa Silos, constructed in 1897, bombed in 1917.

(Source: Pekin, F. (1938). Silolarımız. Ankara: T.C. Ziraat Vekâleti Neşriyatı, Silo Komisyonu Yayın No:1, Ankara, Turkey.)

The locality of the approaches and use of environmentally dependent materials started to decrease as the time came around the contemporary periods when the technological developments, the introduction of new materials and techniques surpassed the countries' borders and the latest solutions started to be accepted globally in different communities. As the methods and needs changed, people began to search for bigger, faster, easier solutions.

2.1.2 The invention of Grain Elevators and Reinforced Concrete Silos

After the middle of the 18th century, industrialization and steam-powered engines began to take place. Thus, the process of development and the way of production started to change from traditional means. In agricultural production, the industrialization process affected the methods of moving and storing the grain with

the help of a new mechanism called the grain elevator. It allows large masses of grain to be lifted up and brought back down quickly from the storage space to the vehicles without much workforce and in less time.

In order to learn about the invention of the silo structures, the previous conditions of its birthplace need to be understood. It all began in Buffalo, New York. Located in the Great Lakes area, Buffalo was on one of the most important trade roads of the United States.

After the introduction of steamboat transportation and the opening of the Erie Canal, Buffalo became a major port for grain trade, even named as the most significant grain market on the continent by the Board of Trade and Commerce. Later, the addition of railways took the spotlight and improved the situation even more due to being able to operate all year long despite harsh cold weather and the advancements in developments and facilities next to the railways (Kowsky, 2006, p.21-23).

In this context, it is no surprise that the invention of the grain elevator appeared in Buffalo towards the end of the 19th century with two people's efforts: the entrepreneur Joseph Dart and mechanical engineer Robert Dunbar. Joseph Dart had seen that the loading and unloading process of grain in the ports was slow and based on the human workforce. However, people in Buffalo were utilizing the use of steam-powered machines and railway technology at the time. Realizing the current conditions of loading and unloading techniques of the facilities were not meeting the existing developments, he concluded a need for an invention to handle the carriage of grain. In 1842, Dart and his engineer Robert Dunbar invented the steam-powered grain elevator. Thanks to their new creation, workers could complete what took a week to unload grain within hours and with less human force. (Kowsky, 2004, pp. 23-25).

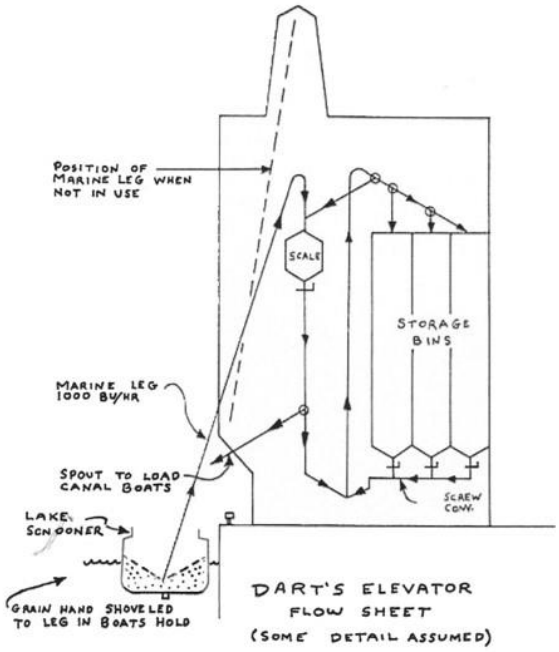


Figure 2.7. Dart's and Dunbar's grain elevator design, working principle.

(Source: https://ourgrandfathersgrainelevators.com/2018/08/14/in-the-19th-century-buffalo/)

To put it in context, before the grain elevator, it took a dozen workers a day to load a boat on the canal. However, one worker could load the same amount of grain on a railway carriage in an hour with the grain elevator. Later on, the engine advancements in the late 19th century could even be four times more effective (Lee, 1937, p.20).

After this development and its spread, engineers began to search for new storage spaces that could accommodate the grain elevator and have maximum strength and durability while also providing large volumes of space for storage. Going vertical rather than occupying much land area also became a possibility with the newly introduced grain elevators. Thus, the invention of silos, depot structures that house the grain elevator, and large bins, built with the latest technological development named reinforced concrete, came to life.

At first, the elevators were built using wooden construction, as the material was easy to use and cheap. However, there was a fire hazard due to combustions from overheated grain. Thus, a search for constructing silos with fireproof materials began. After being improved with the industrial developments, steel became an alternative. However, it was still not ideal for large-scale silos. Another option was to use ceramic tiles, but the construction of tile silos was expensive, time-consuming and the mortar joints needed a lot of maintenance (Kowsky, 2006, p. 33-37).

Later, concrete became the best option as it was the safest against fire and vermins. The timber formwork was costly, and working with the concrete required time and skill. But maintenance of concrete was low, and the insurance rates were higher (Leslie, 2020). Thus, even though steel silos have been relevant ever since, reinforced concrete silos became the pioneer structures for grain storage.

These new concrete silos consisted of tall vertical bins and horizontal conveyors spanning along the bins from the top and bottom of the design. The elevator and its related equipment are located above the bins and conveyor floor. The upper conveyors enabled the grain lifted from the fixed elevator leg to be distributed to the bins, which stand closely in a row. Meanwhile, the lower conveyors on the basement floor distribute the grain coming from the bins. In the end, the iconic look of a silo structure with several tall bins stacked each other accompanied by a horizontal upper floor with openings and a smaller head-like elevator located at the top of the form came to be (Kowsky, 2006, p. 31).

The inventor of the cylinder-formed reinforced concrete silos was an engineer named Charles F. Haglin. In 1899, he designed the first reinforced concrete elevator in Minneapolis after studying concrete grain elevators on his trip to Europe. This cylinder-formed structure was called *Peavey's Folly*. Built with a formwork system called *slip form*, it immediately gained attention and later became the pioneer of the cylindrical American silo constructions that have become a rural symbol today by replacing the standard rectangular warehouses (Kowsky, 2004, p. 39).

Figure 2.8. The first cylinder reinforced concrete silo by Haglin.

(Source: http://slphistory.org/peavyhaglinelevator/)

In Buffalo, the first reinforced concrete elevator was built in 1906 using slip form, and it was named the American Elevator (Kowsky, 2006, p. 40). Following this event, the area started to be filled with many concrete silos. In the future, the region would be referred to as the Silo City.

Figure 2.9. American Elevator, first concrete elevator in Buffalo (1906).

(Source: Schneekloth, L. H., Landmark Society of the Niagara Frontier., & State University of New York at Buffalo. (2007). Reconsidering concrete Atlantis: Buffalo grain elevators. Buffalo, N.Y: Urban Design Project, School of Architecture and Planning, University at Buffalo, State University of New York.)

Reinforced concrete silos are impressive with their massive size and are more sturdy. They utilize the ideal volume of space for maximum grain storage, require minimal effort to operate compared to previous solutions, and are convenient in every site regardless of the environmental conditions. Later, this new structure would not only change agricultural production, trade, and community development, but it would also affect the development of new construction techniques, architecture, and urban planning.

2.1.3 Modernization of Agriculture Industry and Rapid Construction of Silos in Early Republican Turkey

The introduction and utilization of this new technology of grain elevators and silos came to Anatolia during the new Republican period in the 1930s.

Muslims in the Ottoman Period were living earthbound and unable to trade, which meant they could only do agriculture. Meanwhile, the underdeveloped industrialization was either in the control of minorities or foreigners (Kongar, 1976, p. 54-56). When Turkey was founded, most of these foreigners and minorities were no longer living in Anatolia. This meant that the state’s chance at establishing industrialization at the start was gone.

Because of people's economic background and the state engaging in wars for many years, the economy became the primary concern when the new Republic was established. İnan states that the priority of economic development was to process resources independently, and another aim was to bring society to the level of contemporary civilizations through this development (1972, pp. 9-11).

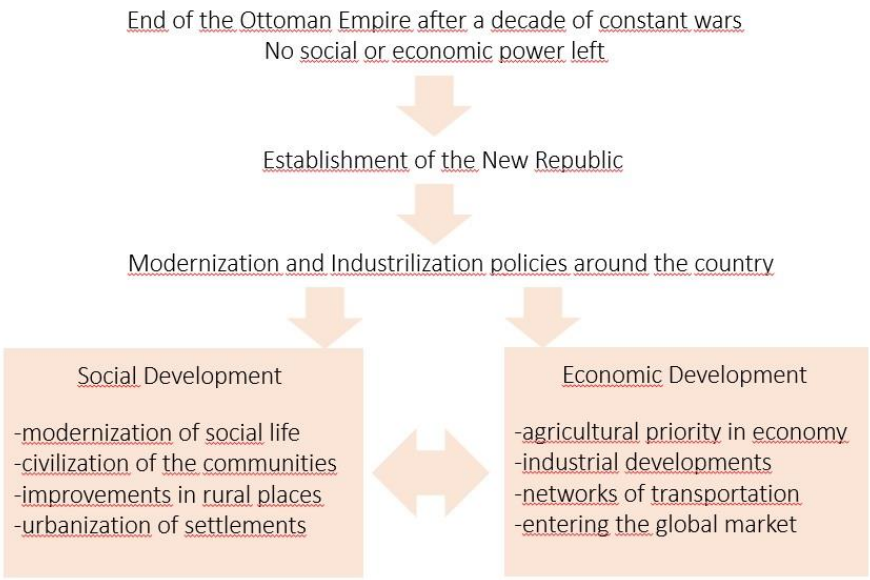


Figure 2.10. Social and economic development from the modernization agenda (Author, 2021)

To modernize the society in material and nonmaterial aspects, Atatürk planned to implement the ideology of becoming a western society. However, since the bourgeoisie, merchants and entrepreneurs were not powerful enough to provide economic background for this cause, the new Republic stayed earthbound and depended on agricultural production (Kongar, 1976, 278).

As Ömercioğlu demonstrates (2006b, p. 292), the social structure of that time mainly consisted of the underdeveloped rural population ruled by feudalism. Those uneducated people were conflicting with the emerging national values and ideals. On top of this, they did not know about modern agricultural production techniques or technologies. They relied on outdated methods and excess human work.

The new state aimed to **modernize and develop the agriculture industry** in all rural and urban settlements, thus similar to the Ottoman Era, the Republic would take the reins at the management of grain matter into its own hands and implement it throughout the whole country.

Simultaneously, grain stocks started to increase worldwide after 1928, which began to push the prices. In 1932, grain cost was not even three kuruş, although it was previously 15 kuruş per kilo. To keep the producers' loss minimal, the government assigned Agricultural Bank (Ziraat Bankası) to purchase grain from villagers (TMO, 1968, p. 2). The reason for this shift in prices was the destruction of industrial facilities worldwide in the First World War and the increase in agricultural production that came after. Ten years after the first world war, many countries purchased large amounts of grain from less developed countries like Turkey. These ups and downs in grain prices and production caused Turkey's already weak economy to be more unstable. After the 1929 world economic crisis, the state started the development period and the first Five-Year National Development Plan between 1933-1938. Although the plan's main aim was industrialization, it also paid particular attention to increasing agricultural production as a source of finance (Örmecioğlu, 2006a, p. 48).

Within the etatism principle action taken by the government, there appeared a plan of commissioning the Agricultural Bank and providing financial resources for what would come next due to the lack of a social class with enough resources.

The rapid construction of silos throughout the country by the state occurred. Introduced in 1933, "Silos and Grain Elevators Law" (Act No: 2303) writes in its first article that the Agricultural Bank was responsible for commissioning the construction of modern and technological grain silos and elevators within the country with a budget of 3.000.000 lira. In the fourth article of the law, a committee which was to be formed by the Cabinet Council (İcra Vekilleri Heyeti) was commissioned by the Ministry of Agriculture (Ziraat Vekaleti) to determine several aspects regarding the construction and management of silos and grain elevators. Thus, the first twelve reinforced concrete silos were decided to be constructed within the scope of the law numbered 2303.

In the Arkitekt Magazine, architectural publishing of its time, it is informed that the 3 million lira budget was assigned to construct the four new reinforced concrete silos.

To build the new silos, different companies from Hungary, Germany, France, Italy, Switzerland, and Netherlands have entered a competition. In the end, the German company named MIAG took the job of constructing the Ankara and Konya silos. Meanwhile, the French company of Froment Clavier won the competition for the construction of Eskişehir and Sivas silos. All four of these first silos were identical and had capacities of 4.000 tons each (1937, pp. 127-128). The first silos were smaller than the American examples, but this was only the beginning.

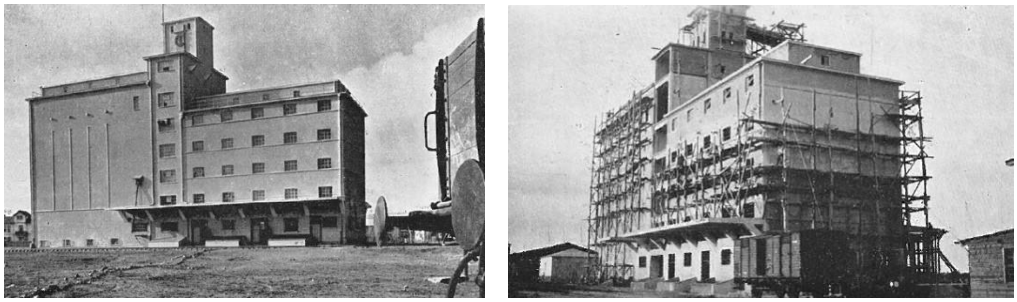


Figure 2.11. Ankara (left) and Konya (right) silos, constructed by the MIAG company.

(Source: Pekin, F. (1938). Silolarımız. Ankara: T.C. Ziraat Vekâleti Neşriyatı, Silo Komisyonu Yayın No:1, Ankara, Turkey.)

Before the new facilities' commissioning, the existing two silos that some foreign companies owned, the Derince Storehouse (İzmit) and Haydarpaşa Silos (İstanbul), were out of use ruined and needed repair by the time of Republic. Thus, there was a commission by the Turkish State Railways for their conditions to be improved and repaired (Pekin, 1938, p.9). The government provided all these storage spaces in such a short period, but there was still a long way to go compared to the western world.

In 1937, Deputy of Agriculture Muhlis Erkmen stated that the existing total storage capacity of the silos was 66.000 tons at the time, and 46.000 tons of this amount was the success of the constructions made within the Republic Period. He also adds that

their goal was to achieve a total capacity of 200.000 tons in the future (1938, pp. 21-22). Because compared to the world, 66.000 tons showed that there was still a long way to go. To name a few examples of storage capacity: Sweden had 657.000 tons, Norway had 131.000 tons, Italy had 2 million tons, Poland had 100.000 tons, the Netherlands had 250.000 tons, France had 2.9 million tons, and Romania had 170.000 tons of grain storage opportunity (1938, p. 208-215).

Thus, as the silos became more effective in the economy, **the import and export increased**, and prosperity began to be achieved. However, as the capacity of the workload grew, it became more challenging for the bank to manage the silos as well.

Five years after the order of law numbered 2303, in 1938, grain production exceeded 4 million tons. Agricultural Bank could not manage and store all this grain, as its primary purpose was to be a bank. So the need for a separate institution arose for this task precisely (TMO, 1968, p. 3). The same year, a new institution with the name of the Turkish Grain Board would be established for this purpose. The construction of new silos and warehouses, management of these storage spaces, and the regulation of the grain market in the country would be assigned to this new institution.

These silo constructions would not only be economically beneficial, but they would also indirectly contribute to rural developments and the modernization of society.

2.2 Architecture and Construction Techniques of Silos

The silos as structures are machine-like storage spaces consisting of a grain elevator, bins, and equipment for cleaning, airing, weighing, dividing, distributing, monitoring, and controlling. The building can be divided into two; the slender core, where the elevator is stationed, and the repeating bin part, where the storage occurs. The elevator part is taller than the bins and takes up less space on the ground. People can occupy this part to operate the equipment; thus, it has circulation, like stairs, and openings on the façade on the floors. However, depending on the size of the silo, this part does not offer much space and is crowded due to the machinery.

Meanwhile, the bin part is shorter and occupies most of the land area. This part is inhabitable apart from the conveyor floors on the very top and bottom floors. Because, between the conveyors, the bins are located, and they are narrow spaces with no openings or access aside from the entrance lids for grain. These bins can have a cylinder or square plan depending on the available materials, needs, and design decisions, but the cylinder form is the most noticeable and well-known technique. When it is constructed, a star-shaped bin appears between four cylinder bins. This fifth one is smaller in volume but also used for storage. Aside from the storage spaces, there are conveyors for grain distribution. They are large longitudinal spaces that span the total length of bins. These parts have openings as the workers operate on these floors, and the access to these areas is from the elevator core.

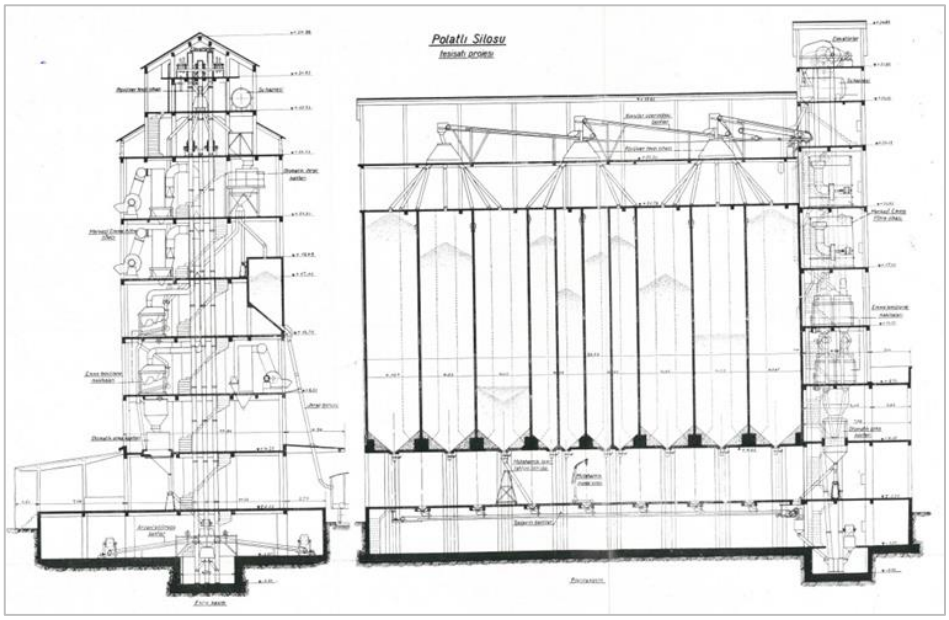


Figure 2.12. The section drawings of the Polatlı Silo. The elevator part is the shorter section, and it is also located on the right side of the longitudinal section. The bins and conveyor floors are on the left side of the same longitudinal section.

(Source: Pekin, F. (1938). Silolarımız. Türkiye Cumhuriyeti Ziraat Vekâleti Neşriyatı, Silo Komisyonu Yayın No:1, Ankara, Turkey. 218.)

The thesis subject's and many other silos' construction material is reinforced concrete. The skeleton structure system is the construction technique for the elevator part and conveyor floors. However, the reinforced concrete bins are made with the slip-form method and sit on top of the slab and columns below them as a whole like a sculpture. Hopper bottom of bins, which is shaped like an upside-down cone, hangs from the end of these circular walls. When stacked next to each other, the walls of bins intersect and make the wall thicker at that part. The columns of the top and bottom conveyor floors align with the one-point intersection of bin walls. These wall thicknesses are smaller than the dimensions of the massive lower columns. Thus, the columns of conveyor floors positioned at these intersections carry the loads.

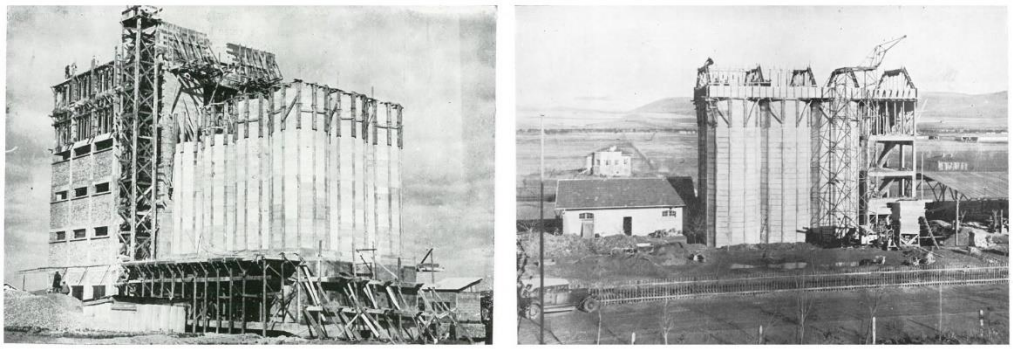


Figure 2.13. Construction of Sivas (left) and Çiftlik (right) Silos in the early 1930s.

(Source: Pekin, F. (1938). Silolarımız. Türkiye Cumhuriyeti Ziraat Vekâleti Neşriyatı, Silo Komisyonu Yayın No:1, Ankara, Turkey. 62-65.)

2.3 Perceptions and Influence of Silos

When silos were first invented, they were not assigned to any task other than the necessities of industrialization. The expectation was that they would improve the storage conditions and be a step to improve the overall production cycle. However, shortly after their invention, new identities began to be attributed to these structures.

Initially, they were designed as a functional structure with no cultural identity or ideological cause. However, as previously mentioned during its invention, silos did not only change agricultural production, trade, and community development, but they became part of the factors that led to social changes. Also, their implementation affected the course of events in architecture and led the way for the development of the modern international movement.

2.3.1 Architectural Influence of Silos in Modern Architecture

Modernism gave transatlantic granaries and airplanes privilege and particular importance as they were prominent sources for development (Bozdoğan, 2002, p. 16). Industrial advancements and machinery were fascinating in many aspects regarding their **forms, materials, scale, construction techniques, and speed**. Therefore, being one of these new inventions, grain elevators and silos had become a source of inspiration to many artists and architects.

When American artists perceived silos as an industrial American object that became a part of the rural context, European architects noticed these structures because of their simple geometry and honest construction at the start of the 20th century. Later on, these structures started to be adopted all over the world by architects like Le Corbusier, Walter Gropius, and Erich Mendelsohn in the light of international style and became one of the first American building types to have this broad influence (Mahar-Keplinger, 1993, p. 8).

Le Corbusier (1965) himself further explained this **influence** in his book "Towards a New Architecture." He states that architecture had failed to base its designs on basic geometric forms. American silos and factories, the first intellectual productions of the new age developed by engineers, overtopped architecture using mathematical equations.

It can be said that the mathematics of these structures comes from the **modular** configuration of silos' simple geometries. The **monumentality** of their appearance

is another factor as this technology enables the utmost, especially in the upward direction. This means that the **verticality** aspect of silos should be significant for modernist architects.

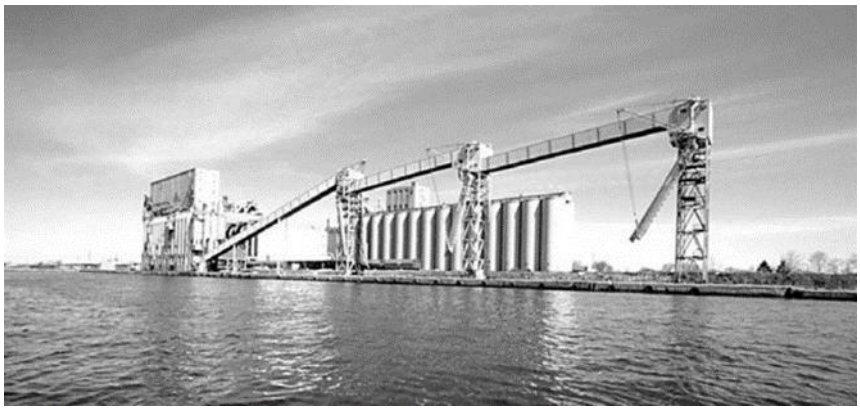


Figure 2.14. Cargill Elevator, Thunder Bay appreciated by Le Corbusier in Vers Une Architecture (1923).

(Source: Vervoort, P. (January 01, 2006). "Towers of Silence": The Rise and Fall of the Grain Elevator as a Canadian Symbol. Social History Ottawa, 39, 77, 181-204.)

In short, these structures were influential because they consisted of massive **cylinder** bins made with **reinforced concrete** material. Cylinder form was desired in order to achieve the maximum capacity with minimum material. Thus, **form followed function,** and functionality became a prominent part of modern architecture.

However, silos were not actually experienced on-site by these architects. The images of silos would be taken from engineering journals and perceived as stand-alone objects without a context. Their appearances were important, but their working conditions or usage were mostly dismissed (Moreno, 2019, p. 104).

Hadas Steiner (2006) demonstrates this situation best with the example of an image of the Buenos Aires Silo used by Le Corbusier, who got the photograph from Walter

Gropius, was misunderstood as a Canadian silo. European architects designed non-industrial buildings inspired by the silos that they had never seen in person (p. 105).

Years after Le Corbusier's statement, Aldo Rossi defines grain elevators as the cathedrals of our times. He mentions that they show collective work overtime. Similar to architects, people who migrated from Europe to America interpreted the architecture of Europe in the first wooden silos. Thus, it created a new rural landscape in the vast lands. He even states that the construction of silos "rediscovered architecture" without worrying about its forms and exposing its geometry and construction within the rural landscape (1992, pp. 7).

Afterward, the Buffalo riverfront would be framed as "a concrete Atlantis" by Reyner Banham (1986), as the silos of the area were standing there to be discovered and studied. He also states that the modern movement in art and architecture is the first one to be based on photographic evidence instead of traditional techniques, survey, and measured drawings (p. 18).

2.3.2 Silos as Symbol of Production and Power in Different Geographies

Silo constructions were costly, but they greatly improved the production cyles and grain trades of their countries. Thus, the idea of having silos began to coincide with striving for the country and the regime bringing benefits to the communities.

As the welfare level of the country increased, the trust in the governments would increase accordingly, and the continuity of the power was aimed at the same time. It also attracted more immigrants to the countries because of economic improvements and thus, increased the workforce.

North American Perceptions in the United States of America and Canada

The foreign artists and architects sincerely appreciated the silos of the United States as machine-like structures supporting the latest technologies. The region in Buffalo later named as the Silo City, appeared in 1906 and prospered until the middle of the

20th century. During that time, these structures brought economic wealth, electricity, and distinctive architecture (Yerebakan, 2021). However, after that time, it all started to fall behind as the agricultural production's place in the economy lessened over time, and new storage methods emerged.

These industrial structures were not just machines for the American people, but they symbolized the American landscape, rural life, and transportation changes. Some local people who did not experience the silos in their prime time considered them 'ugly' with no regard for beauty. Wilhelm Worringer compared silos to the monuments of ancient Egypt as they resembled both the massive columns of New Kingdom temples and the pyramids due to the myth of them being used for grain storage (Steiner, 2006, p. 106-109).

In Canada, silos were perceived as similar to the case in the United States. Buffalo and the Great Lakes area is next to Canada, and during the construction of Silo City, there also appeared many Canadian silos. Patricia Vervoort (2006) mentions that silos that had been indicators of rural settlements, good economy, and attractors of immigration have become "silent towers."

European Examples from Extremist Regimes

Meanwhile in Italy, the "battle of grain" promotion during the fascist regime led to the construction of collective storage facilities in light of the economic crisis in 1929. It became mandatory to deliver your grain to these large-scale facilities managed by the government. Spain also followed a similar approach. However, most European governments only regulated the market prices instead of forcing the producers to hand over the grain (Landi, 2019, p. 49).

This confiscation of grain was not the only negative event. Italian engineers and architects studied the silos. Thus, it enabled the understanding and further development of reinforced concrete as a building material, which was later used to construct the monumental architecture of the fascist regime. Because of this link between fascism and silo, they started to be seen as reminders of the oppressive

government, which was followed by a dislike towards reinforced concrete due to its aging and repair issues (Giuliani et al., 2018, p. 2-3).

Like the fascist ideology, the other end of the spectrum utilized the silo as a tool for political power. In USSR, the communist regime used silos for the propaganda of the new agricultural program.

Figure 2.15. Mayday in Moscow, 1936, designed by Boris Klinch.

(Source: Hatherley, O. (2015). Silo dreams: metamorphoses of the grain elevator. The Journal of Architecture, 20, 3, 474-488)

After the dispossession of the peasantry in the 1930s, silos were used as an image of abundance. However, the fact that there was a large-scale famine in 1933 shows that this image could not be realized. In a promotional regime poster called “Mayday in Moscow," designer Klinch placed silos and grain bags next to Joseph Stalin's photograph. Hatherley (2015) interprets this as Stalin becoming a pharaoh and the silos resembling the ancient Egyptian structures of pyramids, just like the analogy made by Wilhelm Worringer (p. 484-487).

Perception of Silos in Republican Turkey as a Symbol of Modernization and Societal Development

The perception of silos by the Turkish architects was not much different from the modernist European architects. Due to their undecorated mass and volume compositions, Turkish architects perceived silos and warehouses as the new aesthetic in modern architecture. Because of this, the news regarding the construction of new silos was covered by the architectural magazines of the time, like *Arkitekt*[4] and *Mimar*[5], focusing heavily on the buildings' functionality, technological capabilities, and construction materials (Bozdoğan, 2002, p.139).

On the other hand, the rural communities' perception of silo can be examined as a technological structure gaining new meanings and symbols in the context of the Republic, and the social effects of the Turkish Grain Board as a public economic enterprise working for the benefit of people.

The main aim of the Republic was industrialization and urbanization. At the same time, the biggest obstacle was the financing for these issues. Because of this, agricultural production and farmer population were the top priority. Silos in **urban perimeters**, located **next to the transportation** like railways, were at the entrance of the cities for newcomers and peasants. They were the first indicators of the developments provided by the new Republic, assigned to symbolize how the state prioritized its rural population that had been neglected previously. These buildings undoubtedly represented technological advancements both in the countryside and in the city. Their mechanized structure and the use of reinforced concrete as the latest technology indicated that the new state was keeping up with the global methods and trends (Örmecioğlu, 2006a, p. 50).

[4] Memleketimizde Silo İnşaatı. 1937. *Arkitekt*, 4, 127-128.
[5] Memleket Haberleri-Zahire Siloları. 1933. *Mimar*, 2, 63

The high-rise nature of silos in the urban fabric, one of the tallest of its time, was also impressive. Compared with the much smaller structures of its time, silos became the **landmarks** in their surroundings due to their appearance, which could best be described as **sculpturesque**.

Figure 2.16. Ekin Magazine of Turkish Grain Board, showing the social impact of the silos on villagers. Translation of the dialog between the two peasants:

- *Is this the "Citadel of Ankara" they talk about?*
- *No son, these are the castles of our country that feed the soldiers in peace and war.*

(Source: Yıldırım, S. 2019. *Toprak Mahsulleri Ofisi tarihçesi* 1938-2018. Neyir Publishing: Ankara, Turkey.)

Urban silos also had important meanings in **displaying agricultural wealth** in the city to assure people that the food quantity and safety were adequate. The message was that the Turkish Grain Board would always be on the public's side with its large

amounts of stored goods during the **hard times**. As it was reassuring for the population, it also took the peasant policies of the populist ideology further (Sağlam, 2013, p. 153-154). Therefore, silos could be seen as the **spatial symbols** of the state's ideologies and development goals.

Figure 2.17. "Ofis çiftçinin kara gün dostudur" (Board is farmers' friend in hard times) were written on silos after a farmer's words in the 1980s, photograph of Haydarpaşa Silo with these words (Author, 2020).

The ideology that led to the writing of '*Ofis çiftçinin kara gün dostudur*' (Board is farmers' friend in hard times) on the silos in the past continues today. Coupled with TGB's public interest policies, it leaves a positive attitude in people's memories and overall perceptions.

2.4 Changing Function and Architecture of Silos

Since the middle of the twentieth century, the need for silo structures began to lessen with the changing economic and technological trends. The decrease in the bias of agricultural production in world trade, the reduction in the bulk storage of agricultural products by the states, and the tendency to choose the private sector for

grain storage with smaller structures were among the factors that led to this situation. In addition to these, large-scale reinforced concrete silo structures cannot fulfill their functions properly due to being encircled by the growing cities, which then has caused the silos to be demolished, abandoned, or change their usage.

The private sector's handling of the storage of agricultural products is called licensed warehousing activities. The first futures contracts and organized markets on agricultural products and precious metals began to be made in Japan in 1730. However, the United States of America is where licensed warehousing is most common and has been implemented since 1917 to regulate trade and increase quality in agricultural and food products. There are 863 licensed warehouses at the federal level and 6937 licensed warehouses at the state level in the USA, and they are under the control of the private sector. Most of the grains in Canada are traded through licensed warehouses as well. However, unlike the USA, the control of licensed warehouses and grain trade is carried out by the "Canadian Grain Commission." According to the data announced by the Canadian Grain Commission, as of 2013, there are 156 licensed warehouses across the country. Apart from the USA and Canada, licensed warehousing practices exist in many countries such as Poland, Bulgaria, Romania, Hungary, and England (Sezal, 2017, p. 1148-1149).

This method, which has become more and more widespread over the years, creates new income opportunities and increases competition in trade. However, it also renders the existing silo structures, which can be described as rural and industrial heritage areas, out of use.

Demolishing a large-scale reinforced concrete silo is a high-cost job for the construction field. In the sites where the land value is low, preference towards keeping the structure is likely. If the economic conditions are not enough, silos are left unused. Depending on the budget, the interventions might be limited by removing mechanical equipment, installing primary amenities, and providing safety measures and accessibility. However, with the right strategies, the conservation of

these structures can provide sustainable development and economic benefits to where they reside (Worth, 2005, p. 151-152).

Silos are industrial structures designed for storage that mostly do not offer space for human movement and interaction, aside from the conveyor floors and mechanical rooms for regular check-ups and monitoring. They are machine-like structures with no openings on the iconic tall and narrow vertical bins. They are suitable for a few workers to be inside simultaneously on the limited number of open floors. There is also no division of space through its vertical or horizontal lengths. Thus, it offers unlikely characteristics for human inhabitation. These qualities of silos make them very challenging for an adaptive reuse proposal, but they also provide unique solutions and possibilities.

The first silo to undergo the process of refunctioning was turned into an office in Barcelona, by the Spanish architect Ricardo Bofill during the 1970s. In the following decades, other silos were also converted into dorms, residences, and such (Giuliani et al., 2018, p.3).

Adaptive reuse of structures enables regional progress and eliminates the risk of the cultural heritage becoming a frozen museum object. It is an important conservation strategy that rejects large-scale demolitions which are both ecologically and culturally harmful. In addition, governments are leaning towards approaches where instead of funding the conservation, the heritage should pay for its conservation through income-generating strategies (Plevoets et al., 2019, p. 1).

With the ever-growing number of abandoned silos globally, various examples of refunctioning projects exist. After learning their history, social and economic effects, the potentials of silos that are no longer in use with their original functions and their emerging re-functioning projects should be analyzed to see the frame of this field.

2.4.1 Attitudes and Degree of Interventions

In order to assign a new function, silo structures require different levels of interventions because, as mentioned previously, they were not built for human occupation. The degree of the intervention depends on many factors like the budget, community, functional requirements, and awareness towards industrial heritage. According to these factors, the changes in the building would vary from minimal to maximum. Thus, a need for criteria appears to group similar approaches and analyze how they affect the silos.

There exist different categorizations for the interventions made on cultural heritage for adaptive reuse. Bie Plevoets and Koenraad Van Cleempoel (2019) divide the types of contemporary adaptive reuse attitudes into five categories. ‘Typological approach’ depends on matching the appropriate function with the proper typology. ‘Architectural approach’ focuses on the form to form relations with physical alterations. ‘Technological approach’ is when the technical specifications of the building are improved for better performance. ‘Programmatic approach’ starts with selecting a program and then searching for a historic building to accommodate it. ‘Interior approach’ gives value to the immaterial aspects in a romanticist way towards building adaptation (p. 16-20).

Along with the reuse of the existing building, sometimes additional spaces can be needed for the reuse proposal. In that case, there are different options in which the new can be integrated with the old. Francoise Astorg Bollack (2013) determines five different approaches for connecting new forms to old buildings. ‘Insertion’ happens when the new form is inserted inside the old and gets protected. ‘Wraps’ are the reverse technique where the new surrounds the old and provides an enclosure. ‘Parasites’ are the attached new forms from the sides or top, which use the old building's infrastructure, access, and supporting structure. ‘Juxtaposition’ is when the new stands next to the old independently but works together in function. Lastly, ‘Weavings’ are the new forms integrated into the old by reusing elements of the past in this new whole.

Lastly, adaptive reuse as a ruin is also possible for many cultural heritage places, including the industrial ones. Post-industrial landscape designs offer an intersection between the contrasts of natural and manufactured, green and gray, vertical and horizontal. This approach can pave the way for new experiences in public space.

All building types have their unique structural qualities and a place in the socio-cultural order. With this point of view, interventions on silos might have their own categorization whose basis is derived from the previously given categorizations but briefly grouped and simplified to accommodate better.

Thomas Yots (2006) states that there had been three methods towards altering the structure of silos. Some of these designs did not touch the grain storage bins and only altered the open-plan spaces that people could occupy, and some other methods did invasive changes to the bins to provide openings like windows and balconies. Others kept the silos intact and placed installations within the structure (p.117).

From these attitudes, the changes on the iconic bins are the most significant indicator of the type of change. The alteration on the façade becomes a major criterion for silos since people never experienced them from the inside. Their relations with neighborhoods and cities heavily depend on exterior qualities. In addition, there are no groups of worker population inside aside from a few that can convey experiences, pass memories or create customs and traditions in the structure itself. Thus, the degree of change in façade becomes the key determinant in intervention categorizations for adaptive reuse.

2.4.2 Categorization of Interventions and Examples of Adaptive Reuse Around the World

For this thesis' research, more than thirty different adaptive reuse examples around the world were examined. Some of these were just project proposals and ideas that were not built but only published, and the others were realized, starting from the

1970s onwards to today. When looking at these examples, there appear three main approaches towards the silos, just like how Thomas Yots stated in the first place.

The interventions can change both the exterior and interior of silos. However, since the façade is the key factor to the iconic structure, the classification of silos should only be centered around how the alterations affect the outer look of the building, with particular interest on the bins, which make the silo be known as it is.

For a more accurate approach that focuses on just silos, new groupings were decided within the scope of the thesis instead of the previous classifications. This approach leaves the plan layout of the building in the background because reinforced concrete bins made with slip-form exist in every example, even if they undergo inevitable changes due to installation of infrastructure or partial removal. However, these do not affect the overall plan layout, at least on the inhabitable storage parts. Because these structural parts work as a whole and keep the structure standing, in this case, the grouping depends on the exteriors.

The content of these three methods can be briefly summarized as enclosing the silo by making additions on the bins, making changes on the bins by removing mass and providing openings on the facade, or changing the habitable parts while leaving the bins or the silo as it is. In order, they are named as the additions-on-bins, removals-on-bins, and preserved-bins approaches.

Additions-on-bins adaptive reuse means that the silo is covered by a new skin or structure that does not allow people to recognize the existence of a silo or its overall form or look. It is a very costly and high-effort job to demolish the silo. Instead of removing the silo, using it as the structural core of the new proposal is an additions-on-bins approach. In some examples, like Frøsilo by MVRDV and Siloetten by F. Møller Architects, silo becomes the circulation shaft, and the new encapsulating parts carry the function. Other instances might partially destroy the bins to create spaces within the silo for the function, like Silo Point by Turner Development.

The method of encapsulating in the additions-on-bins approach can show slight differences. The common ground in all of them is the fact that the silo cannot be perceived as a whole. In some of them, there is no indicator of the bins, the only way to know the existence of a silo is to learn it from outside sources. The other option is to leave a fragment of the silo uncovered. This fragment can be a limited number of bins or just the bottom or top part of the silo. The exposed fragment of the silo is not enough to understand the whole picture, but it might give a clue from the past to the viewer or a simple reminder to its neighborhood.

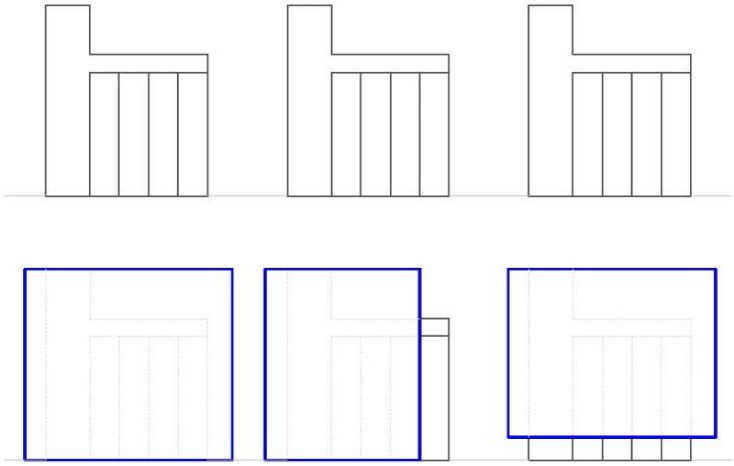


Figure 2.18. Images showing the different additions-on-bins approaches and use of the silo as a core. On the left, the outer shell makes it impossible to perceive anything from the silo. The middle one only exposes fragments of the silo, but the whole structure cannot be perceived. The one on the right allows the viewer to understand the existence of a previous structure, but again, the entire silo cannot be perceived (Author, 2021).

Figure 2.19. Examples of the additions-on-bins designs, matching with the corresponding illustrations above. From left to right: Housing in Denmark by Cobe, Residence in Baltimore by Parameter Inc, Housing in Denmark by MVRDV.

(Sources from left to right: https://www.cobe.dk/place/the-silo, http://www.turnerdevelopment.com/home/#silo-point, https://www.mvrdv.nl/projects/143/fr%C3%B8silo)

Removals-on-bins adaptive reuse means that new openings for windows, balconies, and such were created on the bins by puncturing the reinforced concrete surface. This approach allows viewers to understand the existence and overall mass of the silo, but the façade qualities and the impressions caused by the massive uninterrupted look of the longitudinal bins are lost or not similar as before. The simple geometry coupled with symmetric and repetitive characteristics of the silo appeals to modular design proposals. The placement of bins next to each other offers a grid plan layout, and the changes on facades can transform the structure into multiple habitable spaces. It is not surprising that the adaptive reuse proposals for these silos are mostly dorms, hotels, apartments, and similar residential or mixed uses.

The method of creating the removals-on-bins approach can create possibilities for open and closed spaces on the hollow of bins. However, the perception of the silo is also altered since the bins are the most crucial elements of the façade. In some examples, these openings are smaller and do not continue from one bin to another. Designs like Grünerløkka Studenthus by HRTB Arkitekter AS or Mill Junction by Citiq add the same small window openings for air and light to all the bins and create a pattern. Other instances can be bolder with the openings as there can be a removal

of bin surfaces and spaces all along the length or width of the bin composition for different uses.

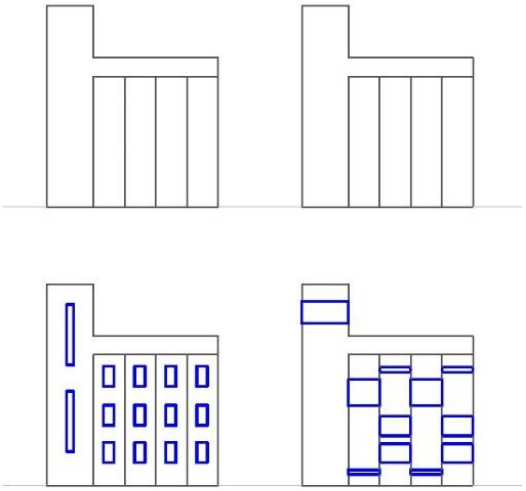


Figure 2.20. Images showing the different removals-on-bins approaches where the silo is visible but altered. On the left, the outer shell is punctured to create repetitive openings for air and light. Meanwhile, the one on the right side hollows out large fragments in the bins to provide open spaces in different elevations (Author, 2021).

Figure 2.21. Examples of the removals-on-bins designs matching with the corresponding illustrations above. From left to right: Hotel in Ohio by unknown local architect, Housing in Finland by PAVE.

(Sources from left to right: https://www.quakersquareakron.com/, https://www.archdaily.com/887591/the-tervahovi-silos-pave-architects)

Preserved-bins adaptive reuse does not alter the bins but provides spaces for human movement by adding new structures or changing the habitable parts of the silo, like the conveyor floors and engine rooms. This approach makes it so that the main silo remains mostly by maintenance, but it also gains new functions. In these design decisions, the recognition of silo as a historically and culturally significant heritage place is more apparent. Art installations, identification of the silo as a landmark, and photographic appreciation of the structure emerge from its community or the visitors. These giant structures urge people for new experiences, and it also attracts architects and artists to learn new things or get inspiration in their new context within adaptive reuse.

Additional spaces that can be attached to the silo or the transformation of the existing ones mainly consist of including circulation elements like stairs, detachable elements for art installations or display purposes, and insertion of offices and atelier rooms. In China, Silo-top Studio by O-office Architects converts just the conveyor floor into an office and a workshop area with additional furniture and installments. Another example is the Minsheng Dock Silo by Atelier Deshaus, a cultural space for art exhibitions in which the conveyor floors are the gallery spaces, but this time, they are accessible through a stairway installation on the bins' façade. Another cultural place, Zeitz Museum of Contemporary Art in Cape Town by Heatherwick Studio, changes the façade of habitable spaces and the bins look untouched. However, the bins are actually hollowed out from the inside, which cannot be perceived from the façade. Thus, this example still belongs in this category.

Meanwhile, the preserved-bins approach also consists of instances that do not add or change anything to the silo itself. In some of these examples, silos are utilized by

projecting visuals on the bins' surface, used for climbing activities, or treated as exhibition objects for a promenade. Silo City is the most significant promenade example as it provides an 'architectural playground[6]' for visiting architects. Another example of this category is the grain silo of Iowa, which is covered with ice for wall climbing in wintertime.

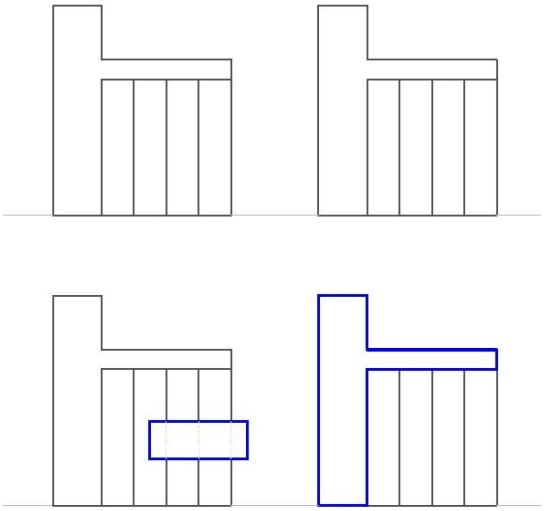


Figure 2.22. Images showing the different preserved-bins approaches that do not alter the bins but add or change spaces for human movement. On the left, the bins and other parts are kept, but additional spaces are attached. Meanwhile, the one on the right side only changes the existing habitable parts, but just like the other, preserves the bins (Author, 2021).

[6] This analogy was made in Worth, D. (2014). Cape Town's grain elevator to become the Zeitz Museum of Contemporary Art Africa. The International Committee for the Conservation of the Industrial Heritage Bulletin, 64, 6.

Figure 2.23. Examples of the preserved-bins designs matching with the corresponding illustrations above. From left to right: Minsheng Wharf by Atelier Deshaus, Zeitz Museum of Contemporary Art in Cape Town by Heatherwick Studio.

(Sources from left to right: http://www.deshaus.com/En/Script/detail/catid/8/id/19.html, http://www.heatherwick.com/ projects/buildings/zeitz-mocaa/)

Figure 2.24. Examples where the silo remained the same without additional spaces or alterations. The left one is the North Wharf Promenade and Silo Park by Wraight and Associates. The structure acts as the projection wall. The one on the right is the Silo City in Buffalo, which serves as an exhibition piece between different art installations.

(Sources from left to right: https://www.world-architects.com/en/taylor-cullity-lethlean-carlton/project/auckland-waterfront-north-wharf-promenade-and-silo-park, Worth, D. (2014). Cape Town's grain elevator to become the Zeitz Museum of Contemporary Art Africa. The International Committee for the Conservation of the Industrial Heritage Bulletin, 64, 6.)

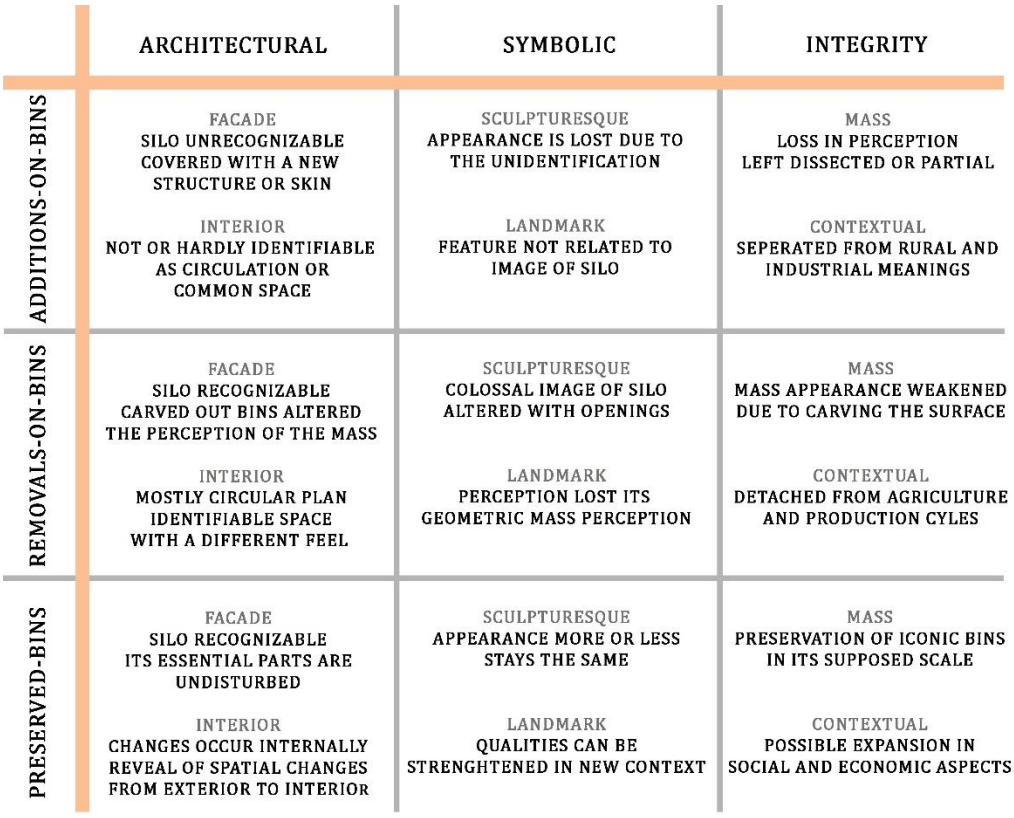


Figure 2.25. Intervention types: Architectural features in terms of façade and interior, symbolic features in terms of silos being sculpturesque and landmark structures, and the interventions' impact on silos' integrity in mass and contextual aspects are explained in a simplified manner (Author, 2021).

These intervention decisions differ from each other in architectural and symbolic aspects, as well as how they affect the integrity of the silo structures. While the additions-on-bins approach changes the architecture in an unrecognizable way, silos with removals-on-bins are only altered so that the perception of the massiveness is lost. Their symbolic meanings also diverge from the fundamental image of the silo, more or less. Meanwhile, the preserved-bins approach comparably remains faithful to its origin, at least when it comes to what makes a silo structure unique from others. This approach offers opportunities without going too far from its essence.

When it comes to the new functions of silos, the most common approaches include residential use, art galleries, museums, and mixed-use. The residential units,

housing, dormitory, and hotels, are seen in additions-on-bins and removals-on-bins adaptive reuse methods. If the mixed-use includes residential units, the same techniques come to the fore again. This is not surprising considering the fact that the previously mentioned modular nature of the bins is easy to insert rooms for accommodation, use as the circulation or act as the structural support for attached residential units.

However, if the proposal includes art galleries, exhibition spaces, or museums, the preferred approach is the preserved-bins silo. Because of their architectural qualities, silos are great for exhibitory functions. The movement inside the open spaces and the surface configuration throughout the bins can create various options for an unmatched experience with the correct strategic placement.

The experiences of the inhabitants of these projects are also various. The hotel project in Ohio, the Inn Hotel Quaker in Akron, was found successful by its community as a residence. The people made an analogy in which they are stored inside the bins like the grains in the past, thus connecting them with the building (Yots, 2006, p. 119). Meanwhile, the young population embraced the Silo City, a cultural site with three abandoned large-scale silos. The owner of the silos, Rick Smith, rejected the need for detailed plans and large budgets for adaptive reuse (Campo, 2016, p. 325). Instead, he came up with a project that depended on cultural programming. Locals, tourists, artists, and architecture students have shown interest in the site through the years. He states that the previous generation failed to see the potential of silos, but young people get inspired by them (Yerebakan, 2021).

2.5 Reframing the Conservation of Silos: Values and Significance

This chapter examined the history of agricultural storage, silo's invention, its effects on the world and Turkey, perceptions of the communities, and the adaptive reuse approaches towards this heritage to reframe the understanding of silo's conservation and determine its values.

Joint ICOMOS-TICCIH Principles for the Conservation of Industrial Heritage Sites, Structures, Areas, and Landscapes state that the industrialization of humankind for the last two centuries made the industrial heritage a crucial part of the modern world built fabric. As the product of this industrialization, silos are at risk of loss due to a lack of awareness, recognition, and protective measures. Moreover, economic trends, environmental issues, advantageous locations, and large sizes contribute to the reasons for this risk. However, conservation of these structures can contribute to the sustainable development of their regions at different scales. Because they physically and contextually affect their environment, as explained before in the thesis, by employing social and economic growth and architectural advancement.

In order to understand the silo as a cultural heritage, it needs to be reframed and separated from other heritage in a unique manner that is distinguishable from others. The realization of its significance would lead to the reasonings behind its conservation.

Silo is a modern, rural and industrial structure. These three qualities are their primary aspects since they are designed for the industrialization of rural production and led to the development of the modern movement. Silos should be tackled within a frame centering around these keywords and their intersections regarding physicality and context. Social, economic, and architectural elements coincided in the interfaces between the primary keywords would prepare the groundwork for these structures' spatial and contextual disclosure.

In rural settlements, industrialization prospered the economic conditions, and the modernization steps led to social improvements in rural populations’ daily lives. Meanwhile, industrialization and modernization together enabled the emergence of an architectural understanding born out of the structure.

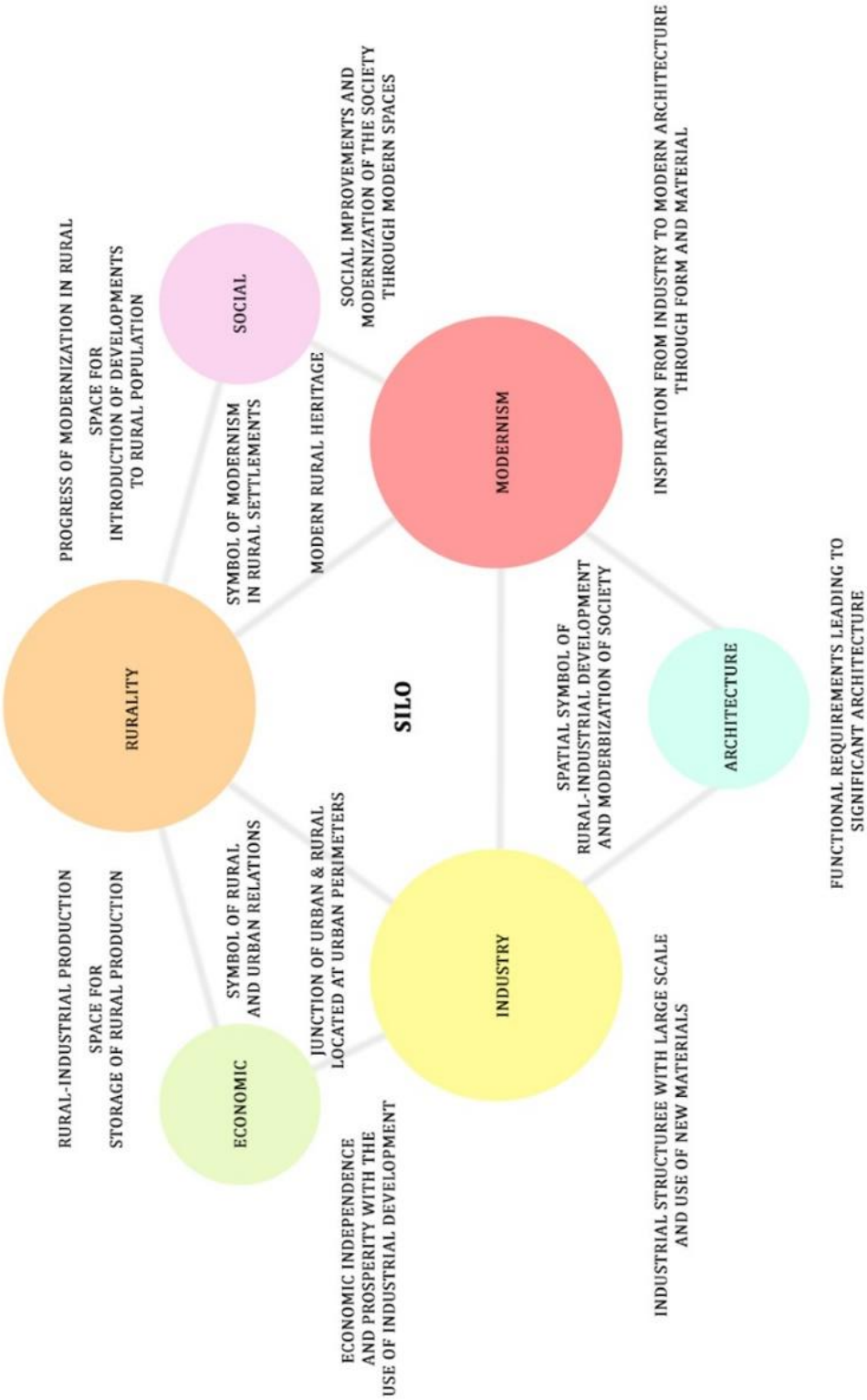


Figure 2.26. Reframing silo as cultural heritage and highlighting its significance for conservation (Author, 2021).

Therefore social, economic, and architectural aspects created the sub-groups that complement the whole framework. The first subgroup to be disclosed is rurality and industrialization supporting the economic situation. Silos are located in rural places or at the urban perimeters, which could be interpreted as the junction of rural and urban borders. Thus, they emerge as an industrial symbol for rural and vice versa. Because silos are the spaces of rural production, they ensure that grain would be kept safely and distributed safely and fairly. Even though there is no production in the traditional sense, its purpose enables economic prosperity by improving the process and conditions, and all of this is made possible by industrialization.

The following subgroup is the rurality and modernization coincided with achieving ideal social conditions. Silos are also symbols of modernization in rural areas, providing an introduction into the new world of advancements and societal change. They are one of the few modern rural heritage structures embedded in the historic built environment to improve society, specifically the rural population. Modern ideologies had to match with corresponding spatial equivalents. Thus, innovative spaces and forms of a silo that go beyond tradition and the use of the latest technology and materials provided that improvement through spatial enlightenment.

Finally, industrialization and modernization met in an architecture that would be one of the building blocks of change in history. For industry, a silo is the embodiment of pure functionality. Thus, it enabled them to become an inspiration to modernists in the sense of form and material. All things considered, this reframing of silos reshapes itself as the values of silos.

Values Of Silos

By its modern nature, silos do not have national or cultural identities by default. However, they gain these values later on, depending on their context. Before the interaction with their own context, silos display common values that define them.

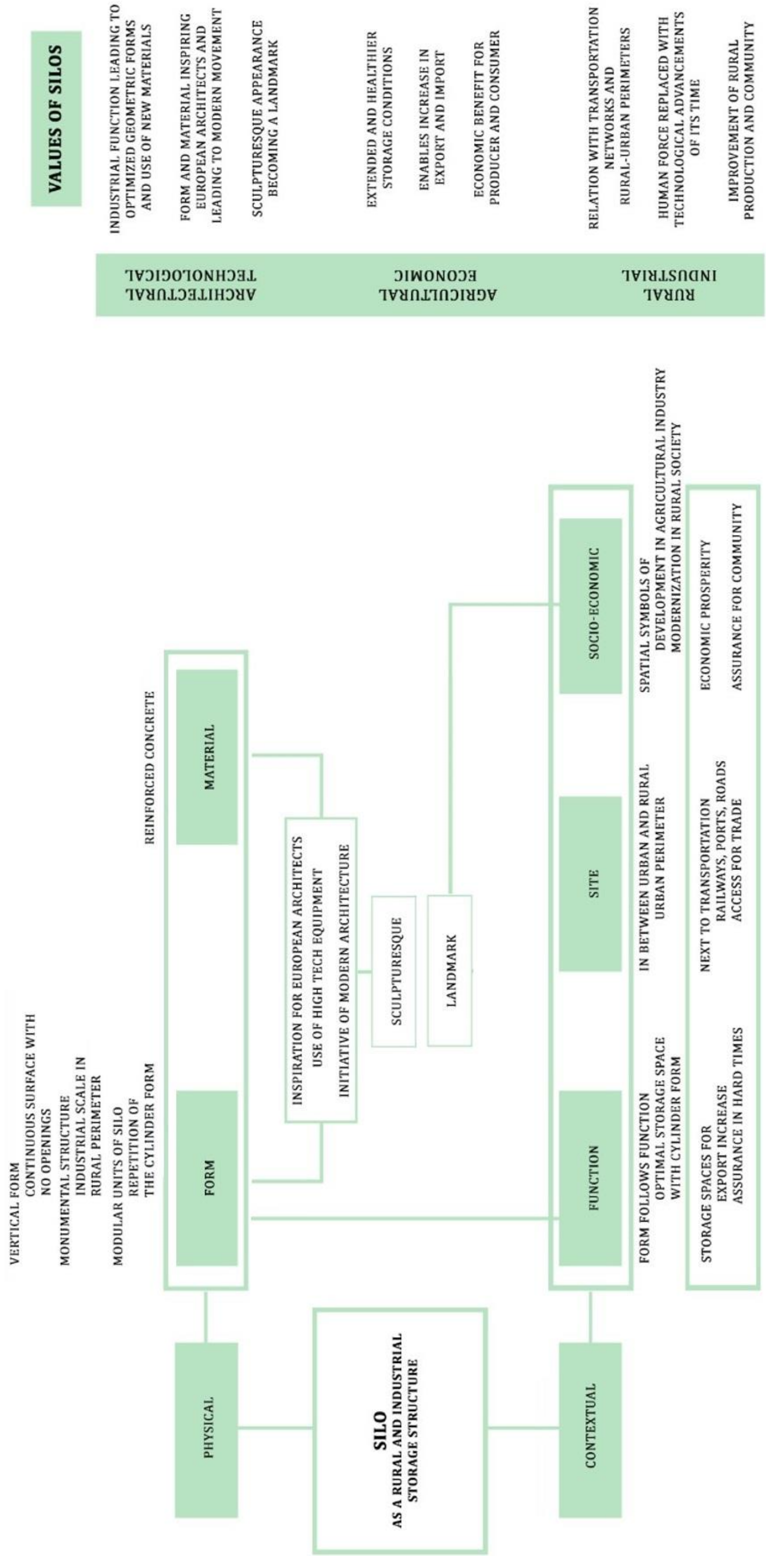


Figure 2.27. Values of silos schematized (Author, 2021).

As a rural and industrial storage structure, the silo consists of a physical body and a meaning in context. This physical body is made up of form and material, which constitutes the sculpturesque appearance of the silo. The sculpturesque look coupled with the socio-economic context becomes a landmark. An example from North America would be that silos were landmarks for attracting settlers for immigration because of the economic prosperity they provide. Since its reinforced concrete material and vertical, monumental, and modular form initiated modern architecture, their architectural and technological values would derive from these aspects.

In a contextual perspective, silo's function, site, and socio-economic qualities would be the main criteria for various values. Essentially it is an agricultural storage space for generating profit through import and export business that also provides safeguarding and insurance to the public grain. Not to mention the extended and healthier storage conditions that benefit both the producer and consumer economically. Thus, with its function alone, it has many agricultural and economic values.

The site of a silo is very significant as well because they act as a transition between rural and urban, both physically and metaphorically, due to their impact. Moreover, silos were the first buildings that welcomed people while entering the cities through railways and harbors. In social terms, this opened a door that allowed the rural population to see beyond their little world. Additionally, silos lifted farmers' workload off their shoulders and made people save more time. Developments in the industry led to improvements in rural life. Thus, enable silos to have values regarding these topics.

Due to their nature, silo structures are neither production nor consumption, neither rural nor urban and neither agricultural nor industrial structures. Their storage features works for both production and consumption, rural and urban, agriculture and industry. Silos, which have features from these **opposing concepts**, are situated at

their intersection and become a linking element. Thus, they form an **interface** in between with their entities.

The understanding of silos and their values is crucial. Because just in Canada, it is recorded that grain elevators and silos are disappearing two times faster than the average historical assets. Their conservation issues only become apparent when susceptible stakeholders are involved other than just their owners (Grant, 2018, p. 573). When we take this statistic to the world scale, the numbers are worrying. On top of that, identification of modern heritage's values and significance raises many questions and debates. Nonetheless, unlike regionalist views, modernism's wide range allows each place to interpret the same structure in its own ways (Grementieri, 2003, p. 83-85). The conflicting sides of industrial heritage accompany this complicated yet strong character of modern structures and the unique situations of rural places housing the silos. Thus, open new possibilities for their adaptive reuse and conservation issues within the new framework and defined values.

CHAPTER 3

THE TURKISH GRAIN BOARD (TGB) ANKARA GÜVERCİNLİK SILO AS A PLACE OF MODERN AGRICULTURAL INDUSTRY

Until now, the thesis delivered the historical background of silos, perceptions from different mediums, intervention decisions in adaptive reuse designs, and the discussions of reframing silo conservation and determining values. However, the case study of the thesis, Ankara Güvercinlik Silo, has more significance than just being a regular silo structure.

Unlike some other countries, Turkey has an institution for managing and constructing silos and storage structures, regulating the grain market, and helping the community in difficult times. The Turkish Grain Board, a unique solution to these issues from the new Republic, must be learned within the context of silos for this research to be comprehensive.

The headman of the Ministry of Agriculture, Silos Science Bureau Chief (Ziraat Vekaleti Silolar Fen Bürosu Reisi) Fuad Pekin, states the necessity of silos by defining them as multifunctional storage units that are crucial for the times of abundance, challenging economic conditions, and trade activities of import and export. In the age of rationalization and standardization, they are the places of storage, factory, and laboratory (1938, pp.23-24). Therefore, in every region, TGB expanded its network and established different types of silos that are accompanied by campuses. These campuses house the personnel for the various jobs assigned to these silos and campuses, such as managing the trade affairs, keeping tabs on collection and distribution, or conducting research activities. The structure of the Güvercinlik Silo and its campus should be studied within the networks' context. Located in the capital city and at the center of the Turkish Grain Board's network, Güvercinlik Silo embodies the institution's identity and acquires new dimensions to be understood and evaluated further.

3.1 The Institution of the Turkish Grain Board (TGB) and Its Silos

After the task of rapid silo constructions in the Republican period was given to the Agricultural Bank, it was also given the opportunity to employ civil servants, experts, and various workers as needed and necessary to ensure the fulfillment of purchase, sale, preservation, and administration issues of grain in the provinces. On the other hand, the bank would appoint as many officers as necessary to carry out the transactions at the center. This task also included the storage and preservation of the crop in the required conditions. A "Grain Committee" was formed to deal with grain purchase and sale affairs. According to the new directive, the duties of the Grain Committee would be carried out by the Silo Commission, which was to be established with the law numbered 2303. In between 1933-1934, the Bank increased its purchases almost seven times. However, as time went on, these tasks became a burden on the bank, whose primary task should not have been these issues. Not to mention that the bank was insufficient to achieve the full potential for the cause. The idea that an independent and expert institution should carry out grain management received a positive response (Yıldırım, 2018, p. 39-44).

On July 13th of 1938, the Turkish Grain Board was established by introducing the "Turkish Grain Board Law" numbered 3491. Even though this establishment's primary responsibility was to regulate the grain market in the country, it had gained more roles within the agriculture industry over the years. After grain, the facility added other agricultural goods like barley, rye, oat, corn, rice, bean, chickpea, lentil, and potato to their list to be stored and distributed (TMO, 1979, p. 13).

Turkish Grain Board Law (Act No: 3491) declares the board’s responsibilities, financial provisions, administrational structure, various divisions, and provisional judgments. The institution’s tasks involved managing existing silos (including other grain storage units) and constructing future ones. Turkish Grain Board would define the construction process and techniques of silos and then build steel and reinforced concrete silos in rural areas, urban perimeters, and harbors.

As expected, the Turkish Grain Board started buying and selling grain right after its establishment. The number of grain purchasing centers of the board has been increased immediately. The railway construction program since 1925, had also played a significant role in this action and helped the board spread as these new centers would be constructed next to the railways for easy access to transportation (Yıldırım, 2018, p.56).

Turkey was not the only country that was utilizing an institution for grain affairs. Other facilities with similar duties in the world worked at the same period. Some of these were: in the United States, Commodity Credit Corporation (CCG); in Canada, The Canadian Wheat Board; In Argentina, Instituto Nacional Granos y Elevadores (INGE); in Germany, Einfuhr und Vorratstelle Für Getreide und Futtermittel; in France, L'Office National lnterproffessionnel des Cereals (ONIC); in Italy, Federazione Italiane dei Consorzi Agrari (Federconsorzi); in Spain Servicio Nacional del Trigo (SNT); in Norway Staten Kornforetting and in Switzerland, Administation Federal des Blés. Those in Norway and Argentina worked independently under the supervision of the government. Meanwhile, the one in Switzerland worked affiliated with the Ministry of Finance and the rest were directly affiliated with the Ministry of Agriculture in their countries. (Ziraat Mühendisleri Odası, 1964, p. 16).

Board's Role During the World War II

Soon after its establishment, the Turkish Grain Board met with one of its biggest challenges: the Second World War. Even though Turkey did not join the war, its effects could be felt from every work field, including agricultural production. At that time, the board tried to keep the grain business stable, grow itself as a proper institution, and provide aid to citizens, which were a lot of responsibilities for a new institution with lacking infrastructure. Thus, both good and bad precautions with mixed results were put into action.

The National Protection Law enacted during the war years dictated TGB to provide some legumes (beans, chickpeas, lentils, alfalfa seeds), coffee, tire, margarine, meat,

and oil for the citizens. The establishment of the industries for animal feed and meat-fish was also given to the Board as a temporary assignment. In addition, a flour mill was provided in Konya to revitalize agricultural production (Ziraat Mühendisleri Odası, 1964, p. 8).

As can be seen from the measures taken, the board started to work hard and made breakthroughs to prevent economic harm for people and provide them with various needs and food options in these challenging conditions.

However, these extraordinary conditions brought by the war came with a remarkable set of measures in agriculture that were not always welcomed. Supply problems arose for the army and growing cities, which exceeded the population of 1 million, and significant decreases were observed in the level of agricultural production. In this period, to provide food, the government applied many practices such as the National Protection Law, confiscations, the Agricultural Products Tax (Toprak Mahsulleri Vergisi), etc. These agricultural-oriented economic policies negatively affected small and medium-sized producers (Şener, 2004, p. 90).

In addition, the inexperience of institutionalization during the war period caused the emergence of food shortages. TGB was just getting started, and there were mistakes in the decisions regarding silos. Problems in determining the capacities, making centralized decisions instead of the local, the absence or lack of storage centers were some of these problems. Also, some products have been left to rot in warehouses for a long time due to a lack of infrastructure regarding the transfer. The incompatibility between the railways emerges as another factor that affects this situation[7] (Sağlam, 2013, p. 169).

Despite the negative sides, the agricultural policies implemented during the war years were considered successful. The needs of big cities and the army were met,

[7] Contains citations from the Republican Archives of Prime Ministry (Başbakanlık Cumhuriyet Arşivi) Toprak Mahsulleri Ofisi İdare Meclis Tutanakları, c.1, c.2, c.3, c.4, c.5.

and the Turkish economy became more robust at the end of the war. Later on, the measures taken due to the war caused the rural people, who made up about 80% of the population in the 1940s, to react strongly to the one-party regime and seek alternatives (Şener, 2004, p. 91).

Post War and Further Developments

After the war and change of government, a new era for TGB and silo constructions began. It was a prerequisite for the first silos to have drying, weighing, cleaning, sorting, and electrical loading and unloading systems following the latest technology of the 1930s. Later, a similar agricultural development move would be experienced again as the Democratic Party government constructed the second generation of silos. Fourteen reinforced concrete silos and nearly seventy steel silos were built between the 1950-1960 period (Örmecioğlu, 2006a, p. 48-49).

Since 1952, the government implemented a purchasing policy to support the producer on a high floor price in determining the cost of grain. This policy had considerably increased the workload and services of the board. In these years, silo and warehouse construction policies were determined, and they were built every year according to the needs (Yıldırım, 2019, p. 97, 277).

While creating new depots, the board was following the innovations in the world and continued its modernization. More extensive and faster silos with better computational equipment were built in several cities and harbors.

Figure 3.1. Images showing the comparison of old (left) and new (right) silos of TGB

(Source: Toprak Mahsulleri Ofisi Genel Müdürlüğü. (1968). Toprak Mahsulleri Ofisi 30. Hizmet yılı 1938-1968, Ankara: Toprak Mahsulleri Ofisi)

The liberal economy approach, which started after the 1980 decisions, also affected the financial policies of the board. In this framework, the possibility of obtaining funds from public banks was eliminated, and instead, a free competition environment was adopted. After that, the office had to get resources from various banks and financial institutions on its own. With these sources and the ever-developing technological advancements, new installations of automation programs, traffic signaling systems, electronic truck scales have been put in all workplaces. Dust collection systems were installed to prevent dust explosions in silos. The developments of the internet and communication systems since the 1990s have been accomplished with the board's efforts to improve itself (Yıldırım, 2019, p. 304, 346).

Today, the board’s fields of activities include purchase of products, import, and export of grain, sale of products, sale of grain, morphine and derivatives, sale of

services (laboratory analysis, training), general store, storage of products, licensed warehousing activities, emergency stock facility and forced sales, market evaluation, research and development activities, poppy breeding and seed breeding studies, production of finished products and production of legal drugs (TMO, 2019, p. 30).

Support Policy of Turkish Grain Board

The price support policy that emerged during the World Economic Depression had grown and became an institutional identity for the board, which continues to this day. Along with the aids towards producers and consumers, there had also been supportive approaches towards other institutions that worked for the public interest.

Despite its limited financial means, the board gave credit for establishing the Meat and Fish Institution and became a share capital in Azmi Milli Değirmencilik Firm, Gima, Animal Food Industry (Yem Sanayi), Migros, Güneş Insurance institutions (TMO, 1968, p. 12).

Social Side of TGB

According to the TGB archives, the Directorate of Social Affairs was established within the board in August 1958[8]. Providing educational courses for the personnel, health insurance, and social aid already existed. In addition to these, exhibitions, cinemas, conferences, TGB magazine, lunch, clothing, sports teams, and charity funds were planned to be achieved.

The first publication of the board was the Ekin newspaper. In 1948, TGB published the newspaper once a month and distributed it throughout the country to provide helpful information to the villagers until the publication was terminated in 1950 (Yıldırım, 2019, p. 395). According to the book of the Turkish Grain Board, 40th Year of Service 1938-1978, the "Information Bulletin" has been published continuously for 19 years, and the TMO Magazine for nine years (1979, p. 30-31).

[8] TGB Archives. 2201-2500.

However, these journals do not continue today. Magazines, books, brochures, special issues, albums, etc. publications are issued when needed. Translation service is available for communication with foreign companies and organizations (1979, p. 32). Currently, the board is publishing Board Newsletter (Ofis Bülteni) monthly and online.

Besides the publications, it had a radio network headquartered in Ankara. The Directorate of Communications was established in 1940 under the name Document and Communications Service. In 1956, the radio system was provided by the Raymond company through a grant (TMO, 1979, p. 34).

Aside from within the board, social acts outside the institution involved investments and economic support to producers, promoting and distributing new products and foods for the public.

Figure 3.2. Lentils for everyone, providing new agricultural goods.

(Source: Ofis Bülten, April 2021)

Nevertheless, these were not the only actions taken, but there were also other helps, including the transformation of unused facilities into primary schools (Decision No: 2230/21) and scholarships for students (Decision No: 2732/26) .

The board also helped the people in need with various associations, institutions, and organizations. In Ankara Soup Kitchen (Aşevi), which was established with the aid of the Red Crescent in Ankara Kızılay, poor people and students were given one meal a day. It was an activity to alleviate the problems experienced by the public due to the difficulty of the economic conditions (Yıldırım, 2019, p. 96).

Figure 3.3. The economic and social benefits of the board are briefly explained (Author, 2021).

All these economic and social benefits of TGB led it to be regarded as an essential formation for the nation, and the silos and the network they create have become the spatial symbols of this status.

3.1.1 Network of the TGB Silos

The Turkish Grain Board Silo network enables the institution to operate simultaneously throughout the country. Silos, warehouses, administrative, educational, social, and many other facilities are located along with this network system.

The locations of silos are strategically designated places. To collect and distribute the grain through various transportation means, they are located between stations, the transport network's stops, and agricultural production areas (Landi, 2019, p. 51). In addition, Fuat Pekin mentions that the elements that determine the number,

location, and capacity of the silos are the quantities of crops, imports, exports, and the dynamic state of the world grain market (1938, p. 24).

In Republican Turkey, the expanded construction of railways and the effective use of rail transportation were priorities. The railway network, which spread to all kinds of large and small settlements all over the country, managed to shorten the distances and provide accessibility. As a result, grain collection, distribution, and storage centers were built along the rail systems and coincided with important places of trade, harbors, villages of agricultural production, and the entrance of cities.

Grain production and storage demand were very high at the time. For this reason, many silos have been built or planned to be constructed to store agricultural products such as wheat, barley, rye, and oats. Since these grains are primarily produced in Central Anatolia, the constructions mostly took place there.

In June 1941, a few years after the establishment of TGB, the Board Transport Regulation (Ofis Nakliyat Nizamnamesi) was accepted. Accordingly, the main transportation would be officially by train due to the inadequacy of road transport, but land transportation would be the next resort if there were no railway. Sea transport was also less preferred despite being cheaper because the grains do not stand up to the long journey. In addition, the closed storage areas transferred from the Agricultural Bank to the Board were mainly on the railway routes. The hangars and warehouses belonging to the railway administration were also influential in preference towards the railways. At the same time, the Board opened reception centers considering the railways, and the construction of new warehouses continued on this network. Only after the 1950s, there was a gradual increase in road transport, and by the 1990s, road transport became the number one method for grain transfer by reaching 93% of the total transportation (Yıldırım, 2019, pp. 308-313).

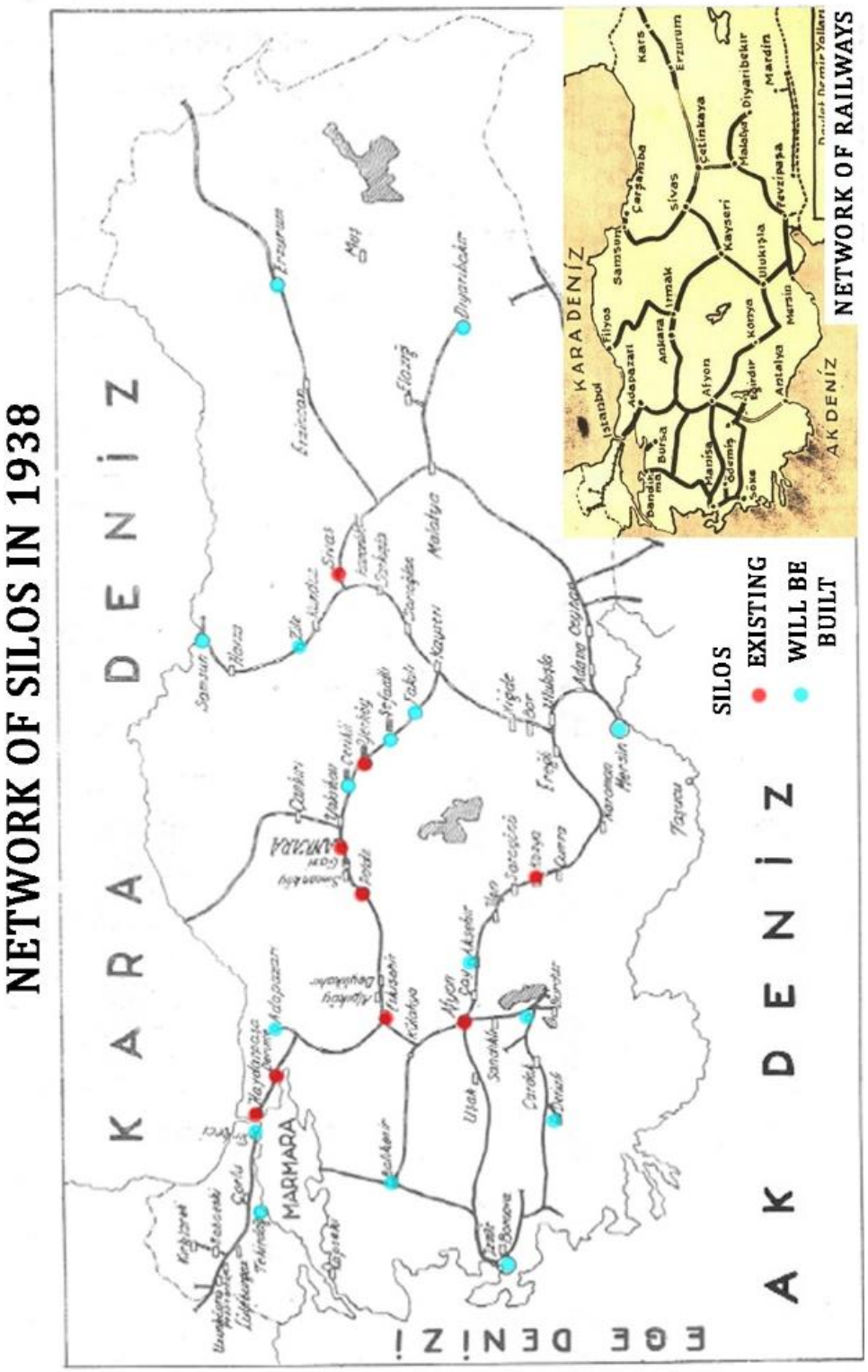
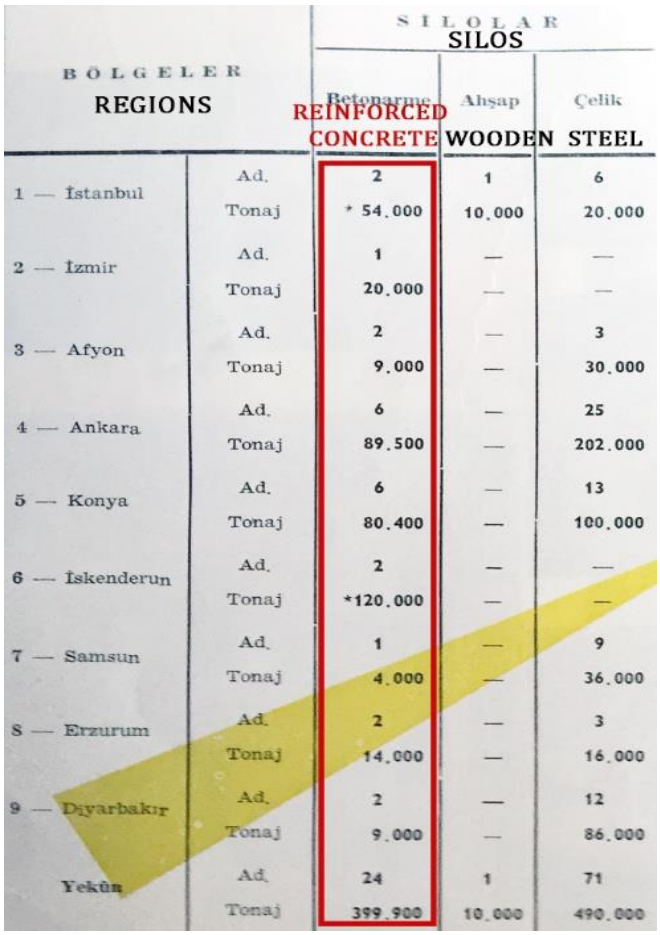


Figure 3.4. Silo construction program and the formation of the early network until 1938, following along the existing railway roads on a reinterpreted map (Author, 2021).

(Source for map of silo network and map of railways respectively: Pekin, F. (1938). Silolarımız. Türkiye Cumhuriyeti Ziraat Vekâleti Neşriyatı, Silo Komisyonu Yayın No:1, Ankara, Turkey. & İnan, A. (1972). Devletçilik ilkesi ve Türkiye Cumhuriyeti'nin Birinci Sanayi Planı, 1933, TTK Publishing, 16, 14. Ankara, Turkey. 5.)

As mentioned previously, with the acceptance of "Silos and Grain Elevators Law" in 1932, several foreign construction companies were commissioned for the rapid silo constructions until the second world war. After the war, the transition to the multi-party system occurred and changed the politics in Turkey, including the agricultural policies. Meanwhile, the population of urban settlements increased, and there was a need to feed more people in the cities. As the production increased simultaneously with the populations, the need for more silos with larger capacities emerged.

To meet these demands, the number of silos in the network had gradually increased. The new wave of silo constructions raised the number of reinforced concrete silos from 7 to 17 between 1955 and 1959 (Yıldırım, 2019, pp. 275-280). Following this, in the early 1960s, there were a total of 24 reinforced concrete silos, 71 steel silos, and one wooden (Derince) silo in Turkey (Toprak Mahsulleri Ofisi Genel Müdürlüğü, 1960).



BÖLGELER REGIONS		SİLOLAR SILOS		
		Betonarme REINFORCED CONCRETE	Ahşap WOODEN	Çelik STEEL
1 — İstanbul	Ad.	2	1	6
	Tonaj	* 54.000	10.000	20.000
2 — İzmir	Ad.	1	—	—
	Tonaj	20.000	—	—
3 — Afyon	Ad.	2	—	3
	Tonaj	9.000	—	30.000
4 — Ankara	Ad.	6	—	25
	Tonaj	89.500	—	202.000
5 — Konya	Ad.	6	—	13
	Tonaj	80.400	—	100.000
6 — İskenderun	Ad.	2	—	—
	Tonaj	*120.000	—	—
7 — Samsun	Ad.	1	—	9
	Tonaj	4.000	—	36.000
8 — Erzurum	Ad.	2	—	3
	Tonaj	14.000	—	16.000
9 — Diyarbakır	Ad.	2	—	12
	Tonaj	9.000	—	86.000
Yekûn	Ad.	24	1	71
	Tonaj	399.900	10.000	490.000

Figure 3.5. The total number of silos, their capacity, and construction materials grouped into the nine regions information include silos that would be completed in 1961. There are a total of 24 reinforced concrete silos.

(Source: Toprak Mahsulleri Ofisi Genel Müdürlüğü. (1960). Toprak Mahsulleri Ofisi 1938-1959. Ankara: Toprak Mahsulleri Ofisi.)

In 1978, 40 years after first mapping, the network had significantly expanded and went beyond the limits of the railway as road transport became more accesible. Thus, the network has become closer to producers all over the country, especially in Central Anatolia, where grain farming is a lot.

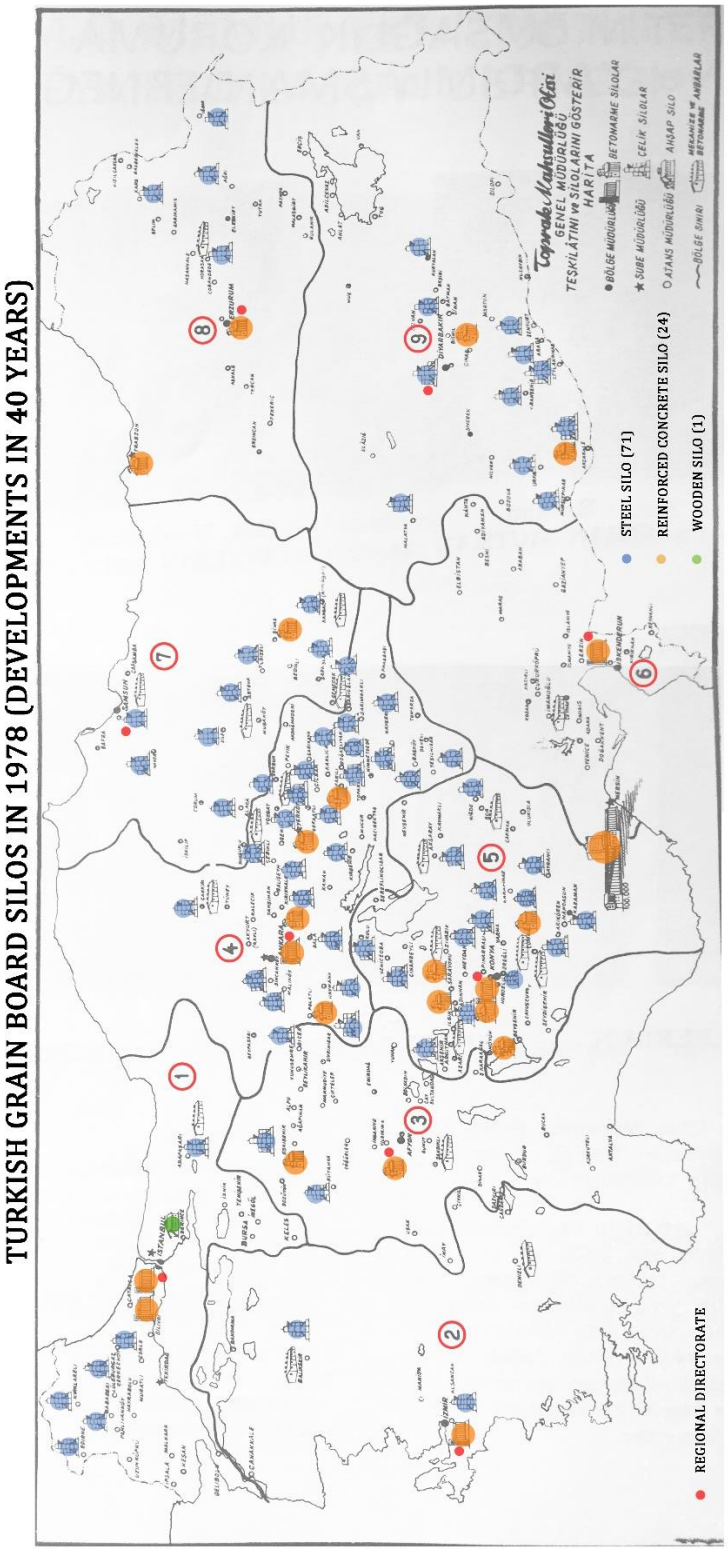


Figure 3.6. Silo network of Turkish Grain Board elaborated on map from 1978 according to the types of construction material in silos (Author, 2021)

(Source: Toprak Mahsulleri Ofisi Genel Müdürlüğü. (1979). Toprak Mahsulleri Ofisi 40. hizmet yılı 1938-1978, Ankara: Toprak Mahsulleri Ofisi.)

Additionally, in the late 1980s, four reinforced concrete silos were built on harbors. Thus, the total number of reinforced concrete silos became 28 (Yıldırım, 2019, p. 296). These structures could commonly be seen in urban perimeters of strategically important cities like those with ports of import and export or settlements where the total excess grain of a region would be collected at last. In comparison, the steel silos were most widely built near small settlements like villages for quick storage of small quantities of grain due to their smaller size, relatively easy construction, and lower cost.

The network of silos is not just a physical entity connected by railways and roads, but it also has social and economic aspects inside and beyond the Board. Farmers bring the grain to their nearby silos after the harvest. From there, the grain follows a journey through the network for nationwide distribution or worldwide export from the ports. The villagers know that the silos in the settlements are part of this network which ensures the safety of grain. This system improves the product cycle from farm to fork and the farmer's working life quality.

In the built environment, the Sculpturusque look of the silo makes it perceived as a landmark. Thus, it acts as the indicator of a settlement and can even be interpreted as a symbolic entrance to a city from railways. In this context, the network also becomes a spatial intermediary between two different settlements consisting of producers and consumers, rural and urban.

Within the Board, the personnel working on duty can go from one agent to other agents for training, research, and other work-related or social activities. The interaction of these people with silos and other auxiliary buildings continues to keep their mechanism dynamic. It helps the silo and campus as a system to be proactive by being adaptable to changes and innovations in the world.

3.1.2 Administrative and Spatial Organization of the TGB Campuses and Silos

Turkish Grain Board is headquartered in Ankara and affiliated with the Ministry of Agriculture and Forestry. The organization consists of a General Directorate in Ankara, an Operation Directorate of Opium Alkaloids Factory in Bolvadin, and the provincial organizations of branch offices (33 in number), agency chiefs (106 in number), and facility teams (68 in number) all around the state. Today TGB works with a capital of 2.550.000.000 TL and serves the agricultural sector with its team of facilities located in every region of the country and temporary purchasing centers that are put into operation during peak purchasing periods (TMO, 2019, pp. 22-25).

In the past, during the founding years, TGB did not have sufficient purchasing centers. Inıtially, the Board was administratively divided into three regions. These regions were: the 1st region, Western Anatolia-Thrace-Central Anatolia, and the Black Sea, the 2nd region in Eastern Anatolia (Diyarbakır - Erzurum - Kars - Karaköse - Bayburt) and the 3rd region Southern Anatolia (Adana-Tarsus-Ceyhan-Suruç-Urfa). A total of 59 purchasing centers were positioned in these regions because the production amount was expected to be higher in 1940 than in 1939. There was also a decision to open new centers in the production areas where the Board did not have an organization or increase purchases by sending mobile teams (Yıldırım, 2018, p. 88). Nationwide, the regional organization of the Turkish Grain Board was decently put into operation in 1946. Its services before this date reflected the transition period from the Agricultural Bank to the Board, and the activities in this period were carried out under the name of the Regional Warehouses Department (Bölge Ambarlar Şefliği) (TMO, 1979, p. 99).

Later, the country was divided into nine regions, and each of them had a regional directorate in an assigned city. These cities with regional directorates are: Ankara, İstanbul, İzmir, Afyon, Konya, Samsun, İskenderun, Diyarbakır and Erzurum.

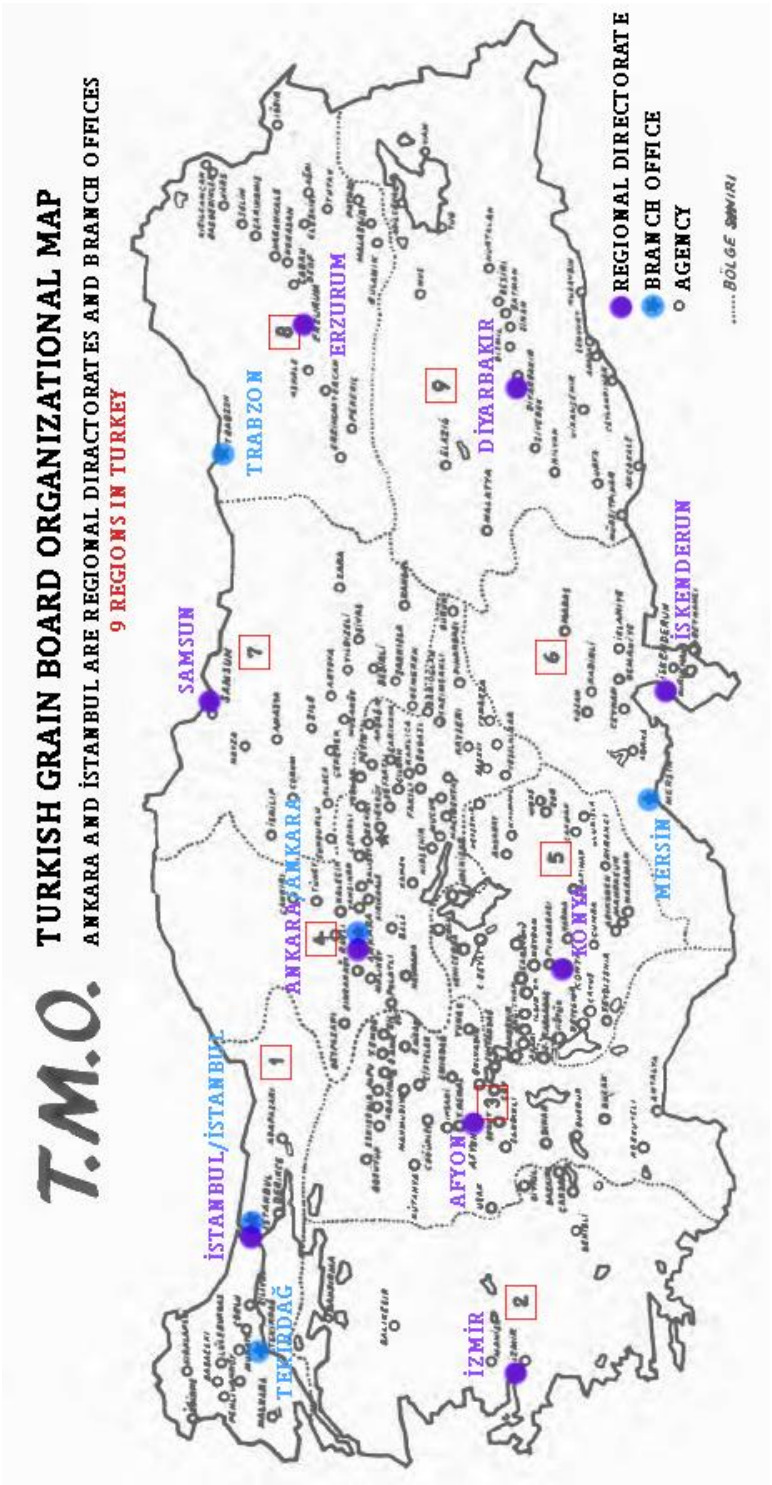


Figure 3.7. Organization of Turkish Grain Board network showing the headquarters elaborated on the regional map of TGB (Author, 2021).

(Source: Toprak Mahsulleri Ofisi Genel Müdürlüğü. (1968). 30. Hizmet yılı 1938-1968. Ankara: Toprak Mahsulleri Ofisi. 17.)

Additionally, there were branch offices and several agencies all around the country. In a map from 1968, there are three branch offices in the port cities of Trabzon, Tekirdağ, and Mersin, alongside the regional directorates. The number of the branch offices has grown eleven times more since then. Also, the cities of Ankara and Istanbul are different from the others as they both had regional directorates and branch offices. The main center of this organization is Ankara. The General Directorate, previously located in the Güvercinlik Campus but later moved to the Kızılay district, is the head of TGB. All the works of the institution are carried out and audited according to the decisions in the General Directorate.

It is expected that silo structures do not stand alone but work together with additional auxiliary facilities to meet various services and needs. Considering the entirety of these buildings as a campus, whenever there is a silo, there is a campus of a certain size and facilities for various programs like atelier, depot, desk office, etc.

Through the years, many of these campuses had disintegrated as the rural population decreased, leaving some of them abandoned or the urban growth reached the settlement perimeters, forcing the campuses to be swallowed by the big cities. In addition, these campus areas sometimes attract third parties due to the land value for rent or its strategic location. All of them may not have survived until today, but the ones that are suitable for the scope of the thesis should be examined and compared accordingly.

Campuses of silos would not be the same everywhere as the demanded workload, or the facilities' population would not be the same. When considering those in similar positions in the hierarchy to categorize campuses, Ankara as a Regional Directorate can be examined together with the other eight directorates.

The campuses of silos lead to urban regeneration in large cities. Because when they were first built, they were located at the old urban perimeters next to railways and roadways. As the cities grew, they followed these transportation networks and came to the silos. Therefore, cities had no choice but to adjust their growth to the silo in their neighborhoods.

Regional directorates are remarkably in line with this statement as they are encircled by the rapid growth of their metropolitan settlements. Since silos are easily accessible places, they became the centers of their new development areas. Today most of them, including Ankara, are surrounded by business and commercial districts where human movement and vehicle traffic are very high, instead of rural agricultural fields. In fact, in some places, the existing movement and traffic capacity are much higher than the amount that allows the silo to work appropriately. Thus, it can not handle the cramped neighborhood and is forced to decrease its workload.

Turkish Grain Board and its silos also influenced the naming of streets, avenues, and neighborhoods in their surroundings. According to Google Maps and Google Earth[9], there are five avenues called after the board "Ofis Caddesi" in Diyarbakır, Burdur, Afyon, Adana, and Balıkesir. It is not surprising that the silos and TGB facilities are precisely located on these avenues. In Çifteler, Eskişehir, there are two streets named Silo and Ofis (board). Meanwhile, another Ofis Dead End Street is in Balıkesir. Lastly, in Şanlıurfa's Siverek and Mardin's Artuklu and Kızıltepe districts there are neighborhoods called "Ofis Mahallesi".

[9] This analysis was conducted in August, 2021.

Figure 3.8. Campuses of regional directorates, located next to railways or at the ports.

(Source for images: Google Earth and Google Maps, 2021)

The campuses of regional directorates show differences from each other. The ones in port cities are mostly smaller and less equipped in terms of social facilities. Because ports are places with terminals for loading and unloading cargo, forest products, livestock, vehicles, food, and containers, they are very crowded with many companies specialize in loading-unloading, transportation, industry, and support services. Therefore, the land area per institution is small and valuable. In some of these campuses in port cities (like İzmir and İskenderun), other services that are not directly related to the warehousing business are located in the inner city, thus making the campus fragmented.

Figure 3.9. Silos in Izmir are located in the highly demanded and crowded region of Alsancak. The lodgements and other social facilities are not located on this campus.

(Source: Google Maps, 2021)

The facilities in Central Anatolia have more comprehensive campuses, including all administration, storage, and social services within their borders. They are also accessible from the same entrances.

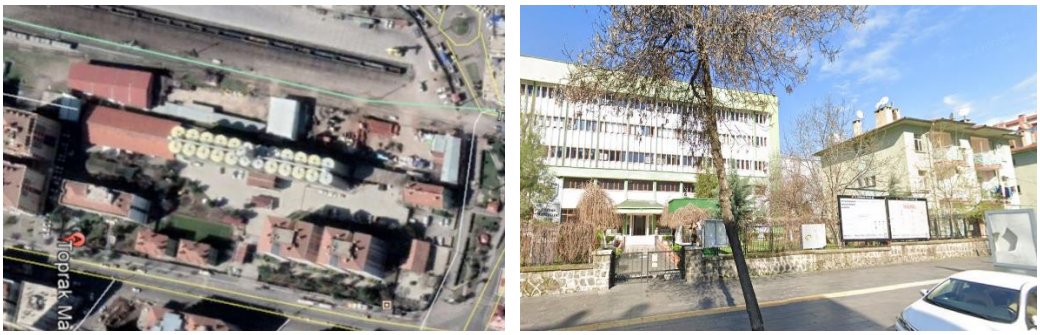


Figure 3.10. The lodgements of the personnel and social facilities with football fields are in the same campus with steel silos and administrative buildings in Diyarbakır.

(Source: Google Maps, 2021)

In some cities, old and new silos are neighbors within the same campus. This shows changes in preferred storage methods and gives an idea of the value of the land. Since demolishment of reinforced concrete silos are costly, when there is no demand for the land, the old silos stay abandoned.

Figure 3.11. The old abandoned reinforced concrete silo and the relatively newer steel silo are on the same campus in Erzurum.

(Source: Google Maps, 2021)

3.1.3 Reinforced Concrete Silo Typologies in the Network of the TGB

In Turkey, the construction materials for silos consist of reinforced concrete, steel, or timber. Reinforced concrete silos are the most durable and safest option for grain storage, as discussed in the invention of silos. Therefore, their constructions had been widespread, including the Ankara Güvercinlik Silo. Thus, it is crucial to categorize and differentiate the types of these silos.

There are three different types of reinforced concrete silos built with cylinder bins. These types are the traditional silo with bins on one side, the extended silo with additional bins attached to the end of the existing ones, and the silo with bins on both sides of the technical core.

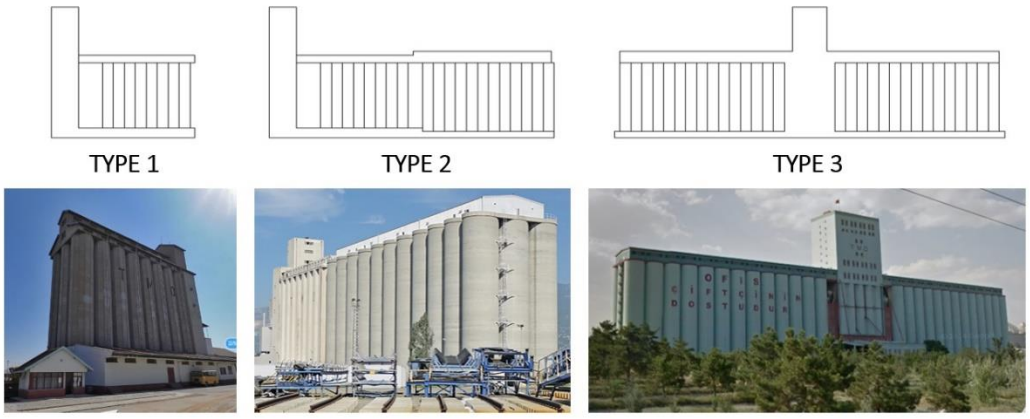


Figure 3.12. Three types of silos: Type 1 the oldest and traditional silo, capacity around 4000 tons, Type 2 advanced version of the first type capacity around 20.000 tons, Type 3 bins on both sides and largest capacity of 60.000 tons – even reaching 100.000 tons in Mersin (Author, 2021). Silo examples from left to right are from Afyon, İskenderun, and Konya.

(Source for silo images: Google Maps, 2021)

The first one, Type 1, is the oldest type and the textbook definition of a traditional silo with cylinder bins. In Afyon and Erzurum, the first design of for this type still exists today, but they are no longer in use. Both Afyon and Erzurum silos can store

up to 4000 tons of grain, and the number of bins in this type varies from 5 to 8 rows. In İzmir and İstanbul, an upgraded version of the same type can be found with much more capacity due to the increased number of bins, height, and volume. The capacities of these silos are 20.000 tons in İzmir (9 rows of bins) and 34.000 tons in İstanbul (12 rows of bins).

Type 2 is an advanced version of the first type with additional rows of bins that make the silo structure more or less double in terms of total length. İskenderun Silo is an example with its capacity growing from 20.000 tons to 40.000 tons of grain (Yıldırım, 2019, p. 271).

Figure 3.13. İskenderun Silo before and after the added part.

(Sources for images from left to right: Yıldırım, S. (2019). *Toprak Mahsulleri Ofisi tarihçesi 1938-2018*. Neyir Publishing: Ankara, Turkey. 271 and Google Maps, 2021)

Lastly, Type 3 has bins on both sides and provides the largest capacity of 60.000 tons of grain in silos of Ankara and Konya – even reaching 100.000 tons in Mersin, the biggest silo in Turkey. The number of rows in Ankara and Konya is 13 bins on both wings, but again the most number belongs to the Mersin Silo with 18 rows of bins on each side. Also, there are shorter bins on the lower parts of the central core for this type. Thus, this silo type provides the maximum space for storage.

3.2 The Turkish Grain Board (TGB) Ankara Güvercinlik Campus and Silo

One of the most critical rural policies of the Democrat Party period was the highway-based state policy. The roads reaching the villages and the increase in tractor ownership in the rural areas caused significant changes in villages. People started to immigrate to the cities due to technological advancements in production, and there appeared a surplus in agriculture due to new developments. Therefore, between 1950 and 1960, a new wave of silo structures was built to store surplus agricultural products. The Güvercinlik Silo, which was built in Atatürk Forest Farm during this period, connected the farm with Ankara as storage, production, and recreation area (Aycı, 2020, p.13).

According to the Turkish Grain Board's accounts report from 1956, the new wave of silo constructions ensued during the first half of the 1950s. At that year, the Ankara Güvercinlik Silo, with 60.000 tons capacity, was 67 percent completed, and the Konya silo with the same capacity was 58 percent completed. Besides these, other reinforced concrete silos in Mersin (100.000 tons), Tekirdağ (20.000 tons), Haydarpaşa (34.000 tons), Alsancak (20.000 tons), and Trabzon (10.000 tons) were under construction simultaneously. Ankara, Konya, Mersin, and Tekirdağ silos were funded with 6.000.000 sterling by the Simon Handling Engineers trust and built by the contractor company of Christiani and Nielsen Firm (p. 51-52).

Ankara Güvercinlik Silo started operating in 1958 as a reinforced concrete silo with bins located on both sides of the central core and one of the most advanced silos of its time. The opportunity for these constructions emerged because of the Turkish Grain Board's efforts in agricultural development.

TGB has become one of the institutions that have the most contact with abroad piers in Turkey. Trips to foreign countries were made every year to learn about the innovations in the field, to establish business contacts, and to purchase materials such as machinery and equipment. As a matter of fact, the General Manager of the period,

Bolayır, went to England in 1957 upon the invitation of Simon Handling Engineers Ltd, the company responsible for building the Güvercinlik Silo. Seeing the internship of the General Directorate interns at this company's factory, he would have the opportunity to discuss future sales and silo management policies in Turkey. (Yıldırım, 2018, p. 112-113).

Figure 3.14. Ankara Güvercinlik Silos photographs from the north (left) and south (right). Establishment in 1958 by the English company of Simon Handling Engineers Ltd.

(Source: Turkish Grain Board Archives, 2020)

When the silo was constructed, it stood alone with a few service buildings on the vast expanse of land sold from the Atatürk Forest Farm to the TGB. Later, a campus was built facing the northern façade of the silo, and it started to establish a relationship with its environment, which has been developing and changing over time. Later, the silo and the campus would begin to enter a process of change with these changing political, economic, and social factors.

3.2.1 Previous Reinforced Concrete Silos of Ankara

Before the construction of Ankara Güvercinlik Silo in 1958, there were three other silos within the city borders of Ankara. These were the Ankara Silo, Polatlı Silo and Çiftlik Silo and hey were all constructed in 1933 (Pekin, 1938, 9-12). The Ankara

Silo was located in Sıhhiye District, and the Çiftlik Silo was in AFF. These places were rural lands back then but later became a part of the city center. Unlike the other two, the Polatlı Silo was constructed in the Polatlı town of Ankara, away from the city center and main axes[10].

During the rapid silo constructions by the commission of the state with the law numbered 2303, the German Company of MIAG built the Ankara Silo, while the French company of Froment-Clavier built the Polatlı and Çiftlik Silos (Örmecioğlu, 2006a, 49). These were among the first silos of the new Republic, even before the establishment of the Turkish Grain Board. Ankara and Polatlı Silos had a capacity of 4000 tons of grain each, and the Çitflik Silo had a capacity of 1000 tons. These silos implemented new technologies of that time and contributed to rural Ankara's agricultural development (Pekin, 1938, 9-12).

Today, these three silos do not work for grain storage anymore, and they all face a different end. The Ankara Silo was demolished due to the urban planning decisions after the 1970s. It was located near the railways and train station in Sıhhiye. After its demolishment, the currently existing Ankara Court House was constructed in the silos approximate location (Örmecioğlu, 2006b, 297).

Meanwhile, the Çiftlik Silo is different from the other two as it was an auxiliary building of the Brewery Facility existing in the Atatürk Forest Farm. The Brewery Factory produced beer, while the silo was used for the storage of grains for the production of this beer. However, the brewery stopped working in the early 1980s and was privatized for another function. Thus, the Çiftlik Silo was left as an abandoned structure that still exists today next to the railways in the Gazi District (Çavdar Sert, 2017, 110).

[10] These will be explain in the following heading.

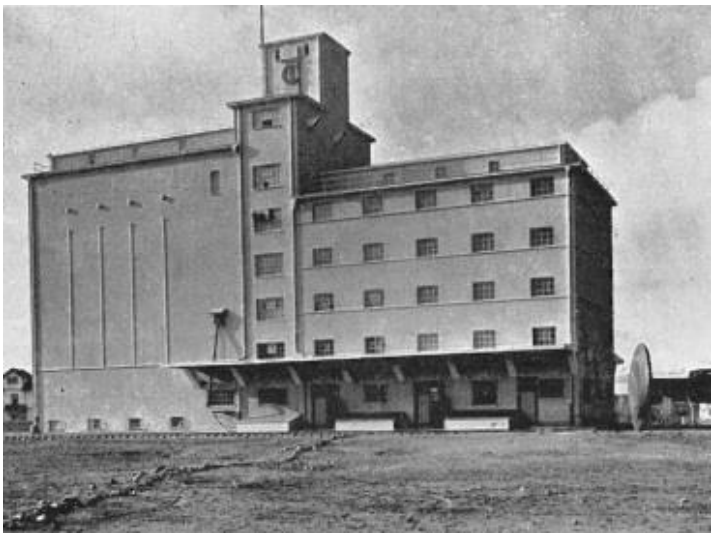


Figure 3.15. Ankara Silo, 1933.

(Source: Pekin, F. (1938). Silolarımız. Türkiye Cumhuriyeti Ziraat Vekâleti Neşriyatı, Silo Komisyonu Yayın No:1, Ankara, Turkey.)

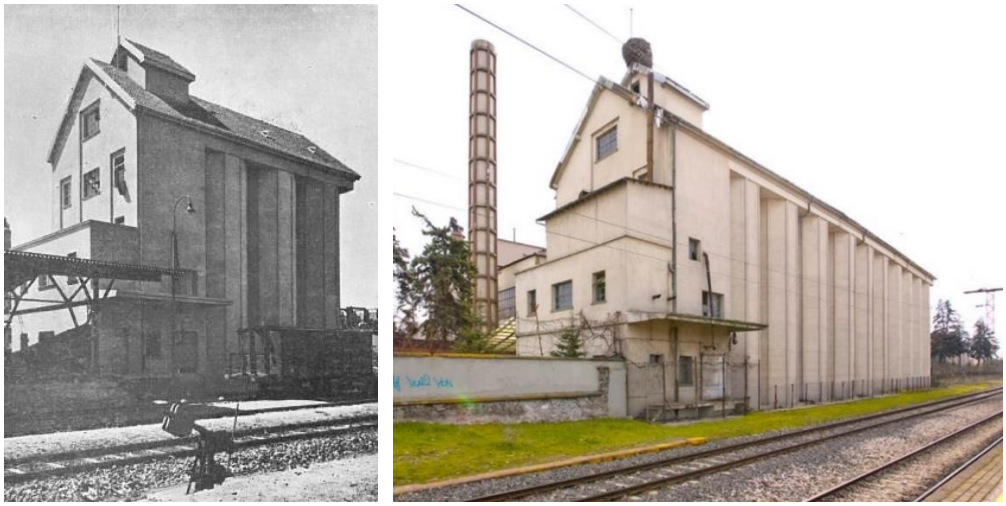


Figure 3.16. Çiftlik Silo in 1933 (left) and is currently left abandoned (right). The number of bins had been increased as well before losing its function.

(Source: (Right) Pekin, F. (1938). Silolarımız. Türkiye Cumhuriyeti Ziraat Vekâleti Neşriyatı, Silo Komisyonu Yayın No:1, Ankara, Turkey. (Left) https://www.goethe.de/ins/tr/ank/prj/urs/geb/mgc/bie/trindex.htm)

Lastly, the silo in Polatlı was used for the TGB's agricultural activities until it was given to the municipality. The Polatlı Silo was re-functioned by the Polatlı Municipality as a city council. The building includes a multi-purpose conference hall, wedding hall, and cafeteria. At the same time, the project, which is a common mind center, aims to manage the city together with the citizens (2019).

Unlike the demolished Ankara Silo and the abandoned Çiftlik Silo, this one was transformed through adaptive reuse. Judging from the openings on the bins' surfaces, this adaptive reuse utilized the removals-on-bins approach as previously categorized in the thesis. Additionally, claddings covered the building, and a large space was created on the ground floor. Thus, it emerged as a rare example of reused silos in Turkey.

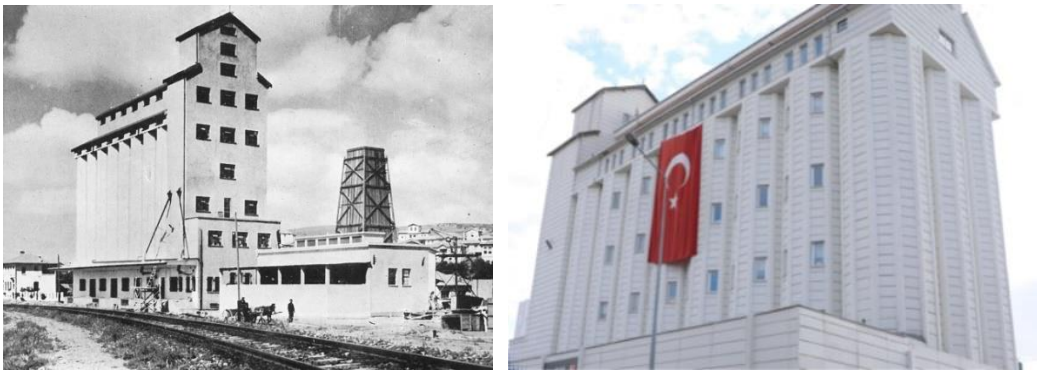


Figure 3.17. Polatlı Silo in 1933 and currently re-functioned as the city council of the Polatlı Municipality with the removals-on-bins approach.

(Source: (Right) Pekin, F. (1938). Silolarımız. Türkiye Cumhuriyeti Ziraat Vekâleti Neşriyatı, Silo Komisyonu Yayın No:1, Ankara, Turkey. (Left) http://www.polatli.bel.tr//proje/kent-konseyi-binasi/42)

Unfortunately, the relationship between the Güvercinlik Silo and other silos in the city is unknown, aside from the general relationship of the TGB network. It is also not clear if these previous silos had campuses when they were first constructed, but

based on old photographs, there are no signs of campuses aside from the Çiftlik Silo being next to the Brewery and working for that complex. Nonetheless, when looking at a map, it can be seen that the silos in the city center are constructed towards the western side of Ankara, following the railways.

Figure 3.18. The location of the Güvercinlik, Çiftlik, and old Ankara silos within the city center. The Polatlı Silo is located in the Polatlı settlement away from the city center (Author, 2022).

3.2.2 Location of the TGB Ankara Güvercinlik Silo and Its Relationship with the City

Silos being constructed along the railways correlates with the strategy behind locating silos in the settlements. They are supposedly placed in the rural and urban perimeters that act as an interface for both sides as it contributes to the benefit of rural producers and urban consumers simultaneously.

When Ankara was announced as the capital of the new state, it was just a small rural town in Central Anatolia. The government aimed to transform this settlement into a modern city suitable for the image of the new republic. Thus, two master plans to develop Ankara as an urban settlement came in order by two different German architects. These were the Lörcher Plan (1924-1926) and Jansen Plan (1931), which greatly affected urban form and identity generation. In Lörcher Plan, the city was divided into two districts of Angora and Tchankaya (Çankaya) as historic and modern quarters, respectively. Angora remained as the historical and traditional part that is to be conserved, while Çankaya was developing with the constructions of residential units and governmental buildings. At that time, the farmlands and establishments of Atatürk Forest Farm were also started to be planned separately. Ankara's connection with the other settlements depended on the railways coming from the west. This railway passed through the AFF lands and had its station leading towards the city center. Therefore, another station was established in AFF in 1926. By the time of 1928, the modern example city of Ankara showed rapid growth and needed a new master plan. Based on the previous one, the new Jansen Plan proposed to develop the city towards north, south, and east along the determined axes. (Çavdar Sert, 2017, 177-187).

In 1933, the old Ankara Silo was established near the train station. This area was between the historic and modern settlements on the west side of the main axes, towards the farmlands away from foreseen the urban growth. The same year, Çiftlik Silo was built next to the new train station in the AFF for the brewery facility.

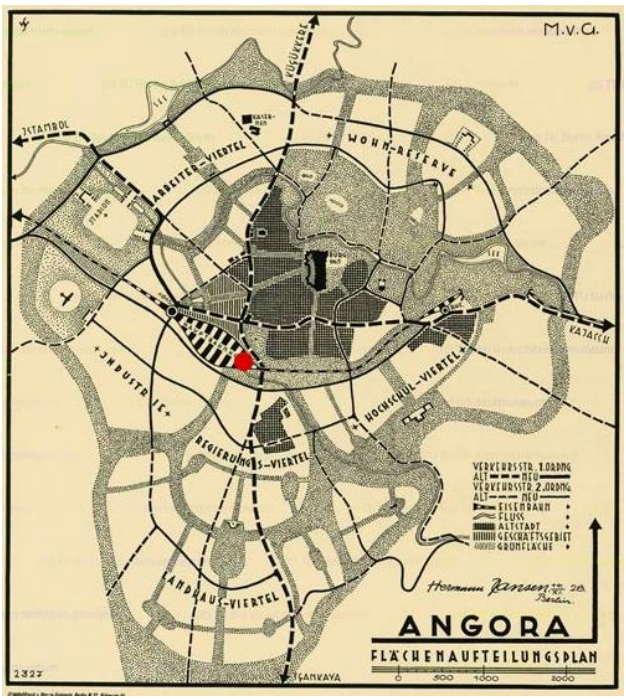


Figure 3.19. Jansen Plan from 1928, approximate location of the old Ankara Silo is shown in red.

(Source: https://www.goethe.de/ins/tr/ank/prj/urs/geb/sta/jan/trindex.htm)

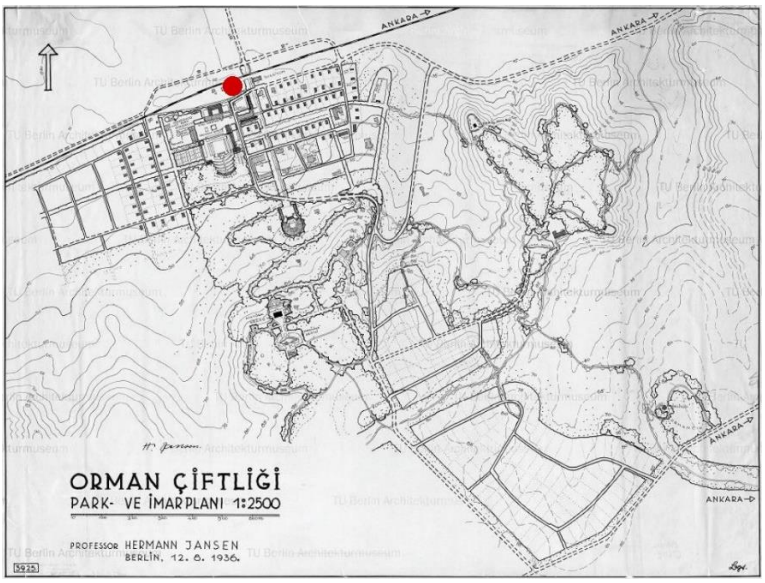


Figure 3.20. AFF Plan by Jansen from 1936. The location of the Çiftlik Silo is shown in red.

(Source: Çavdar Sert, S. (2017). Atatürk Forest Farm as a heritage asset within the context of Turkish planning experience 1937-2017. (Unpublished doctoral dissertation). Middle East Technical University, Ankara, Turkey.)

Later on, in 1937, Jansen made one last proposal for an area for industrial development towards the west of the city within the northern side of AFF borders (Çavdar Sert, 2017, 199). After twenty-five years, the Güvercinlik Silo would be constructed inside this industrial and agricultural zone.

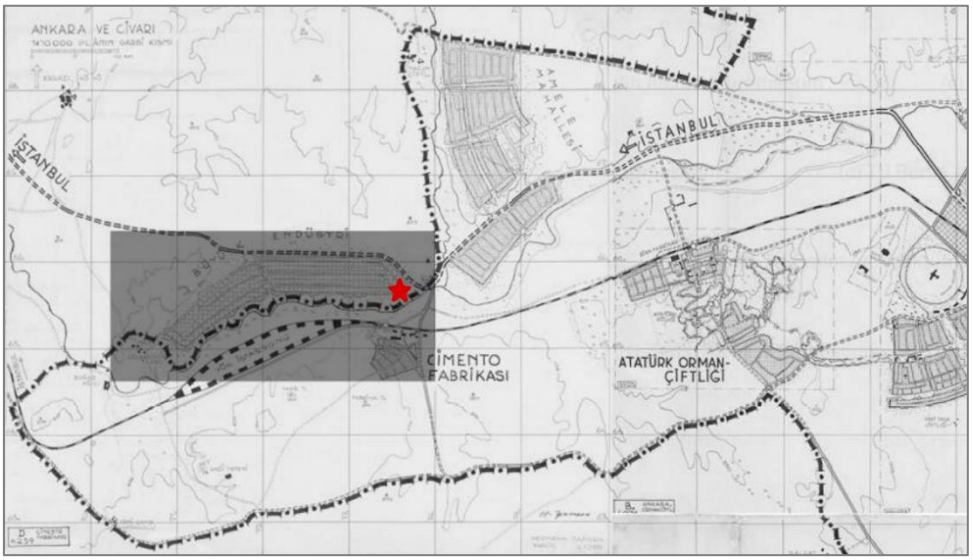


Figure 3.21. AFF Lands in Jansen Plan 1937. The grey area is for industrial development. The approximate location of Ankara Güvercinlik Silo is shown in red.

(Source: Çavdar Sert, S. (2017). Atatürk Forest Farm as a heritage asset within the context of Turkish planning experience 1937-2017. (Unpublished doctoral dissertation). Middle East Technical University, Ankara, Turkey.)

Atatürk Forest Farm, which the Güvercinlik Silo took its land, was the pioneer of Turkish agriculture given as a gift to the nation by the founder of the country, Atatürk, and in 1938 came under the auspices of the Turkish Agricultural Enterprises

Institution with the law numbered 3308. In 1950, the transfer of the farmland was subject to enacting a special law from the Turkish Grand National Assembly (Keleş, 2015, p. 20). But just before that, in 1947, the establishment of the “Saving and Aid Fund” was decided among the members of the central organization. The same year, 101.165 m² of land on the Atatürk Forest Farm was approved to be rented for an annual fee until the law was passed on for its sale to the Turkish Grain Board (Yıldırım, 2018, p.96).

Since then, this land has become a significant base for TGB in Ankara. Storage issue of the agricultural goods was conducted here where the urban and rural settlements of the city meet back then. Later, with the addition of the silo and then the campus, this area became a center and played an essential role in executing corporate activities of storage and beyond.

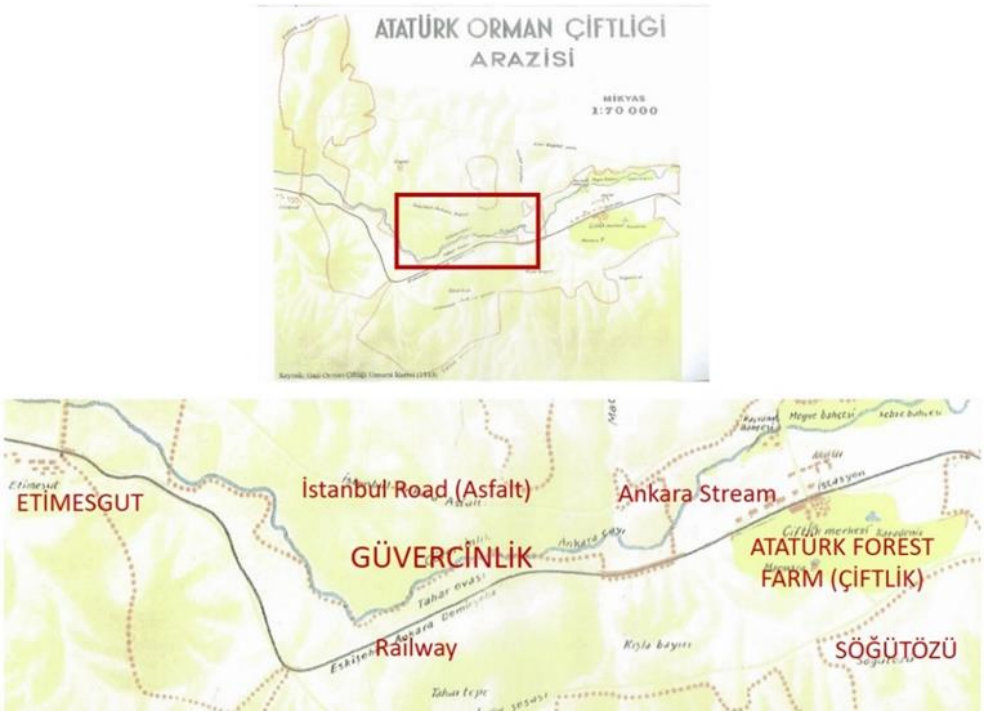


Figure 3.22. Atatütk Forest Farm in 1933. Güvercinlik area and its surroundings are written on the visual by the author.

(Source of the map: AOÇ Mücadelesi 2021 Eski Haritalar http://www.aocmucadelesi.org/index.php?Did=220, retrieved in 2021)

The silo is a transition zone between rural production and urban consumption within farmlands. It connects these settlements through roads and railways. On the north of the Ankara Güvercinlik Silo, it utilizes the İstanbul Road, and on the south of the silo, there is the railway coming from Eskişehir. Both of these transportations link the structure to the nationwide network. Additionally, the Ankara Stream is on the south of the railway as a nearby natural element.

Figure 3.23. Before and after the construction of the silo, the first photograph is from 1952, and the second and third photographs are from 1957.

(Source: General Command of Mapping, 2021)

After the construction of the Güvercinlik Silo, a campus was built on the northern side of the silo. The reason for this was to accommodate better the establishment's needs for its duties and responsibilities in both the institution and nationwide scope.

In Mustafa Kemal Atatürk's will, the aims of the Atatürk Forest Farm were summarized as; realizing agricultural practices, developing agricultural production and industry compatible with the ecology, converting all incomes of the farm to investments, developing production models suitable for the demands of domestic and foreign markets, doing exemplary practices for the organization of producers, supporting land improvement and arrangement studies, creating a healthy urban environment to create a model for food security, and to contribute to agricultural and rural developments (Keleş, 2015, pp. 20-21).

According to the Implementation Instruction on the Protection, Use and Planning of Agricultural Lands (Tarım Arazilerinin Korunması, Kullanılması ve Planlanmasına Dair Uygulama Talimatı), silos are accepted as non-integrated agricultural structures by the Ministry[11]. From this point of view, since the areas transferred to the TGB were used for the silo and its auxiliary buildings, they have been used in accordance with Atatürk's will.

The whole neighborhood around the silo consisted of large plots of land for agricultural activities that belonged to AFF. However, new settlements were formed over time as AFF lost the majority of its land. Yenimahalle District, which the campus is located, its neighbor Etimesgut to the west and Söğütözü to the east would all soon develop over the years from agricultural use to commercial and administrational use, which affect the way silo and its campus operates.

[11] The Law on Soil Conservation and Land Use No. 5403 and the Regulation on the Protection, Use and Planning of Agricultural Lands published in the Official Newspaper dated 9.12.2017 and numbered 30265

In the 1950s, due to the immense rise in urban population and unplanned settlements, a need for a new master plan emerged. The 1957 Uybadin-Yücel Master Plan was created and implemented. However, this plan lacked proper strategies for controlled urban growth and could not prevent the problems. As AFF started to lose its lands, new urban settlements appeared towards the city's west side (Çavdar Sert, 2017, 210).

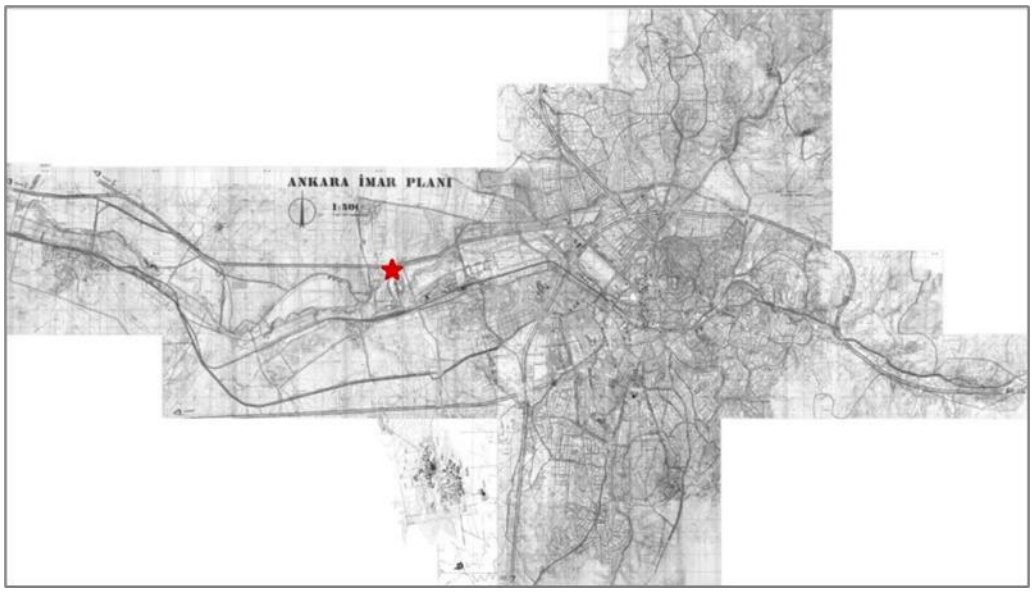


Figure 3.24. 1957 Uybadin-Yücel Master Plan. The location of the Güvercinlik Silo is shown in red.

(Source: Çavdar Sert, S. (2017). Atatürk Forest Farm as a heritage asset within the context of Turkish planning experience 1937-2017. (Unpublished doctoral dissertation). Middle East Technical University, Ankara, Turkey.)

According to the AFF Researches (AOÇ Araştırmaları, 2014), AFF has lost around forty percent of its lands since Atatürk’s death in 1938. The sale and conversion of agricultural lands caused the area to be transformed from rural farmlands to urban zones and encapsulated the silo within a dense urban district.

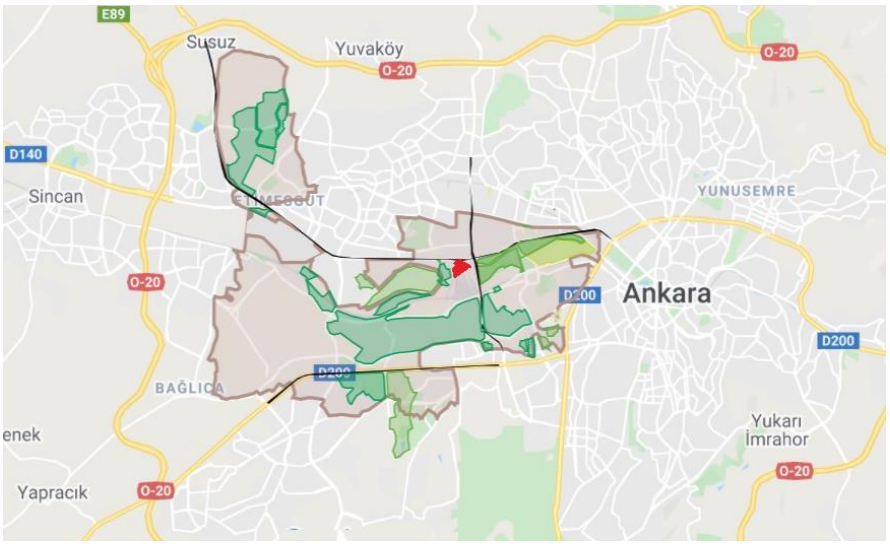


Figure 3.25. Location of the campus, highlighted in red, inside the previous borders of the Atatürk Forest Farmlands. Brown borders are the initial AFF area, and the green areas are left of AFF today.

(Source: AOÇ Araştırmaları. (2014). ODTÜ Mimarlık Fakültesi. http://aocarastirmalari.arch.metu.edu.tr/hangi-alan-aoc/)

Today, the Güvercinlik Silo and Campus reside in the western part of the Ankara city center. In the official documents, it is located in the Orman Çiftliği Neighborhood in Yenimahalle District, within the block numbered 7994, and lots numbered 7 (silo and campus) and 8 (lodgements)[12]. Even though it is next to the railways, the silo and its campus can only be accessed through the roadways, specifically the İstanbul Road. Moreover, the site's rural character does not exist anymore, but there are still some areas left of AFF. However, due to the lack of any information on the matter, these areas most probably do not have any relations with the silo. Nonetheless, its location in the city appears to be a significant feature.

[12] The title deed information is in the appendices.

3.2.3 The Ankara Güvercinlik Campus of the TGB

The campus in Güvercinlik had been built around the northern side of the silo after its completion. When the silo started operating, there were only warehouses, an atelier, and the administrational building, which later turned into the laboratory in the new campus design. Silo was built by foreign companies from England. However, the site plan was drawn by the Turkish architect A. Kadir Pekdemir, and the other buildings on the campus were constructed by Turkish firms. Two of these Turkish firms were the Yağmur Construction and Trading Company which made the Training/Education Building and Cafeteria, and the Geppo Planning and Projecting Firm, which built the Guest House Building, Regional Directorate Building, and the Laboratory. Additionally, Tümtes Project Office and Özger Engineering were two of the responsible firms for the mechanical engineering jobs of the infrastructures[13].

The first plan of the campus dates back to 1979 when the service buildings were placed around a central landscape. This design consisted of social and administrative buildings facing the garden located around a circular center. While warehouses and workshop buildings stood on the west side of the campus seperated by a road leading to the silo from this area, lodgings were placed on the east side away from this central organization towards the south.

The organization of the land can be divided into four parts according to the directions. The northern part is where the social and administrational buildings are located around greenery areas. The western part, which is as large as the north part, contains the warehouses, workshops, ateliers, the old bakery, mosque, and the new laboratory. The southern part is where the silo is set. Lastly, the eastern part, which is actually the southeast region of the campus, has lodgements, three individual houses, and two apartments at the further back.

[13] These informations were written on the technical drawing documents. Any other written source could not be found. Turkish Grain Board Archives, 2020.

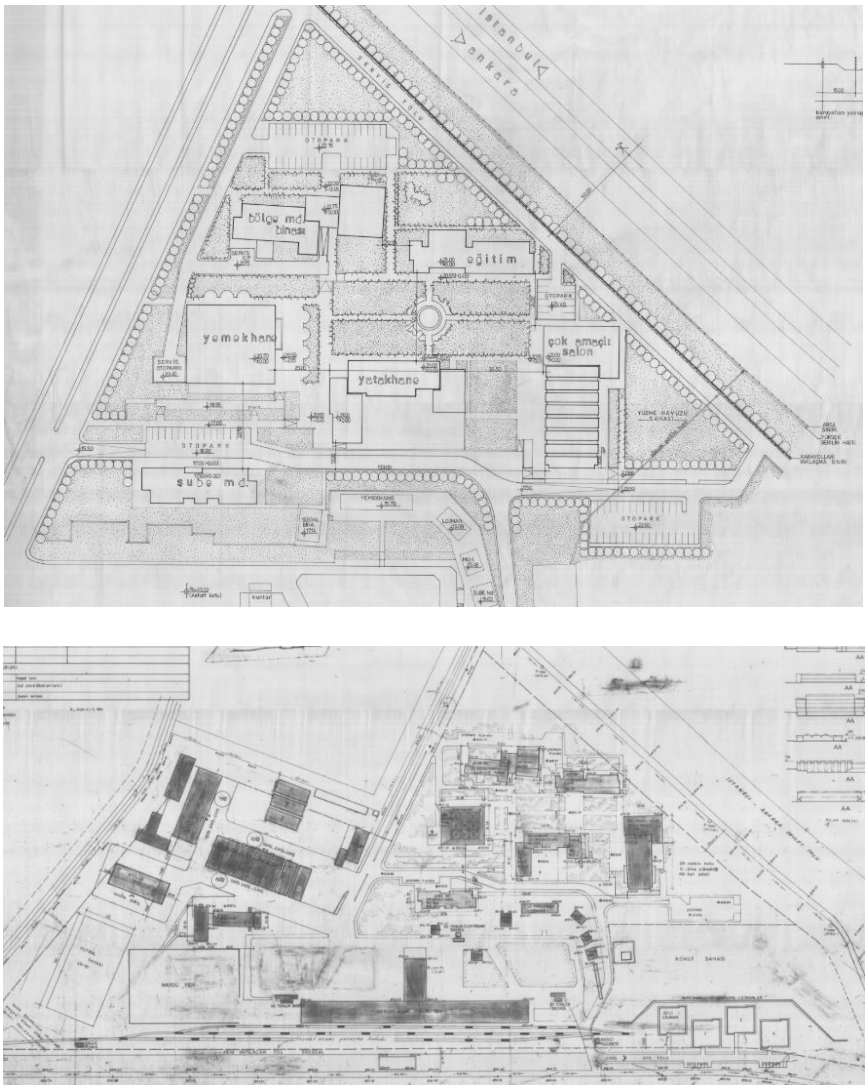


Figure 3.26. Site plan drawings from 1979 (only the northern part) to 1981 (the whole campus).

(Source: Turkish Grain Board Archives, 2020)

There are two entrances to the site. One of them, the main entrance, is from near the İstanbul Road. From the silo to the road, the land narrows towards the north and takes the form of a triangle where the entrance is at the top. Then from the silo side, the road turns to the east towards lodgements. Afterward, it leads to the south and creates the second entrance, near to the lodgements.

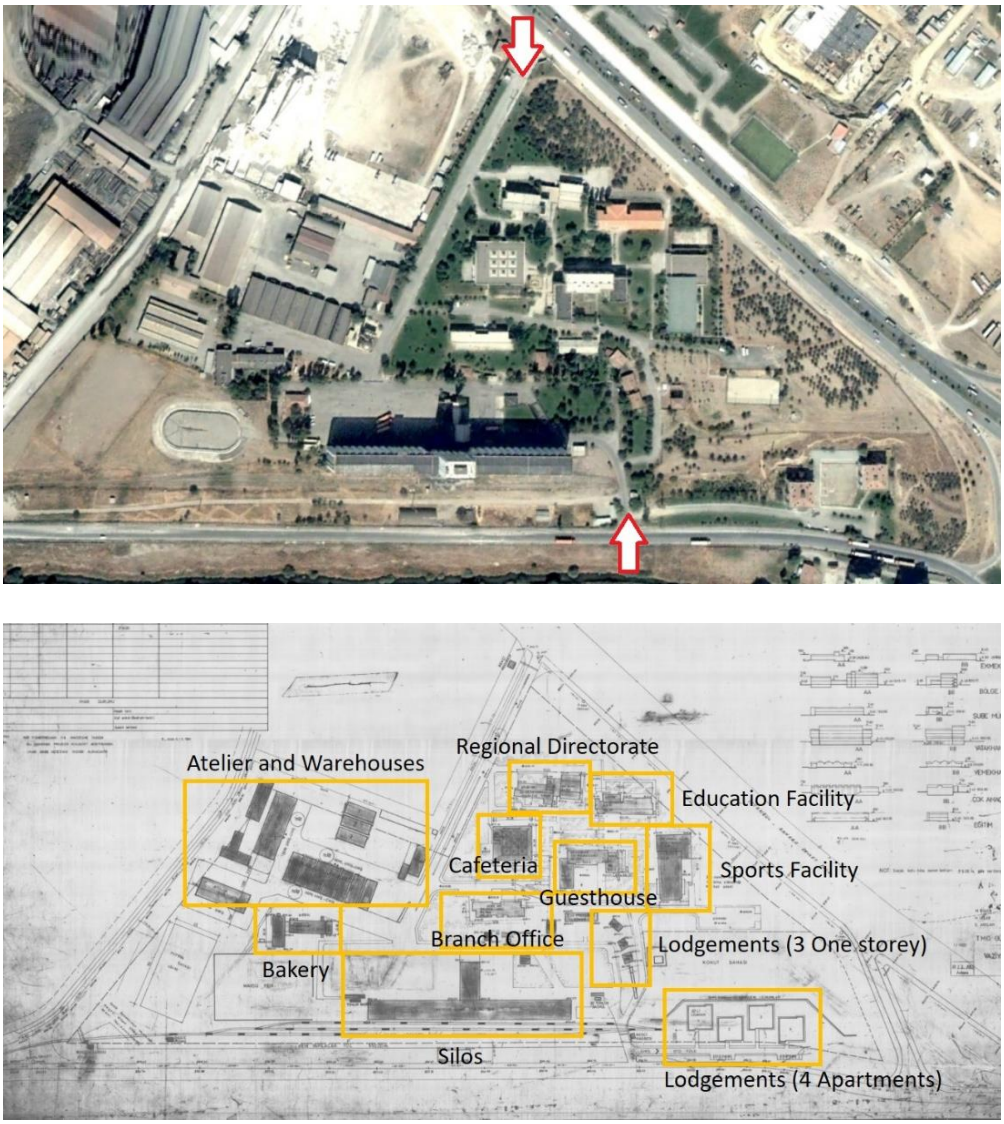


Figure 3.27. An aerial photograph from 2003 showing entrances and the Ankara Güvercinlik Campus site plan from 1981. The campus was designed 23 years later after the completion of the silo. Reinterpretation of the images was made by the author, 2021.

(Source for the aerial photograph: Google Earth, 2021. Source for the technical drawing: Turkish Grain Board Archives, 2020)

In the initial campus, there were buildings for the regional directorate and branch office, education facility, building with a multi-purpose hall that was also the sports

facility, guest house, cafeteria, bakery, various lodgements, atelier, and warehouses. Soon after, a mosque was added to this design.

The branch office was the first building on campus after the silo, which served as the branch office for a short time and was transformed into a laboratory. It is a two-story structure with artificial marble cladding and faux stone plastered surfaces. It is located directly across the silo and is currently abandoned.

The joint studies of TGB and agricultural faculties started in 1954 and provided significant benefits for the country and the Board due to the opportunities for personnel working in the laboratory to do doctorate and research in their fields. All physical, chemical, and technological analyses on grains and opium were carried out by trained personnel with the necessary equipment in the Grains Research and Technology Laboratory in Ankara. In 1969, the laboratory building in Güvercinlik was completed, and the studies of the Faculty of Agriculture continued in this new building. In 1970, it was decided to conduct fee-based analysis on the samples from outside in the Grain Technology Laboratory. Apart from the central laboratory in Güvercinlik, there are 15 laboratories (Diyarbakır, Şanlıurfa, İskenderun, Mersin, Konya, Afyonkarahisar, Kayseri, Yerköy, Polatlı, Erzurum, Samsun, Edirne, Tekirdağ, Bandırma, İzmir) within the provincial branch offices of TMO. Physical and chemical studies are carried out in these laboratories on representative samples (Yıldırım, 2019, pp. 375-380).

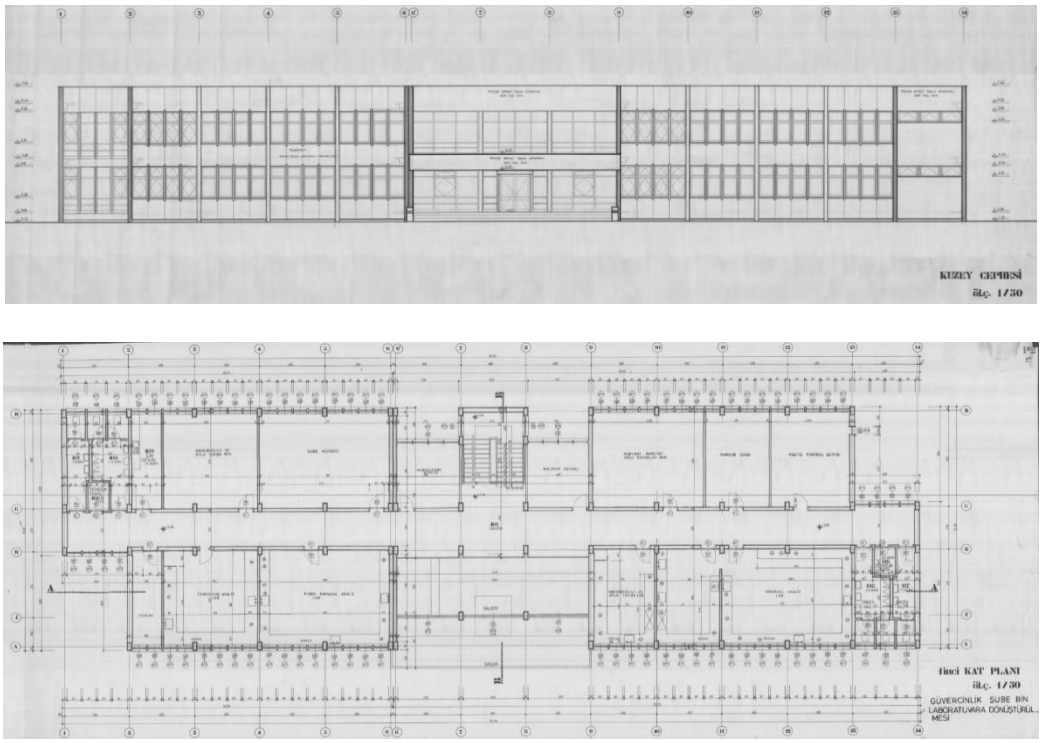


Figure 3.28. Photograph, elevation, and plan drawings for the old laboratory building.

(Source for drawings: Turkish Grain Board Archives, 2020. Photograph by author, 2020)

The workshop/atelier and the warehouses were the other buildings that existed before the establishment of the campus. These structures are one-story high. The workshops are reinforced concrete; meanwhile, the warehouses are steel structures.

The workshop was established in 1942 in Ankara Yenimahalle-Akköprü as a small-scale repair shop to repair wheat transport vehicles under the Department of Transportation. Later, the workshop turned into the Central Atelier Chief as the services of repair and manufacture of mobile devices and the repair, maintenance, and production of spare parts for reinforced concrete and steel silos were added to its workload. The Central Atelier has carried out tasks such as repair, paint-whitewash, leveling, turning, milling, auto and engine works, silo works, writing and calculator repair, and spare parts production over the years (Yıldırım, 2019, p. 385).

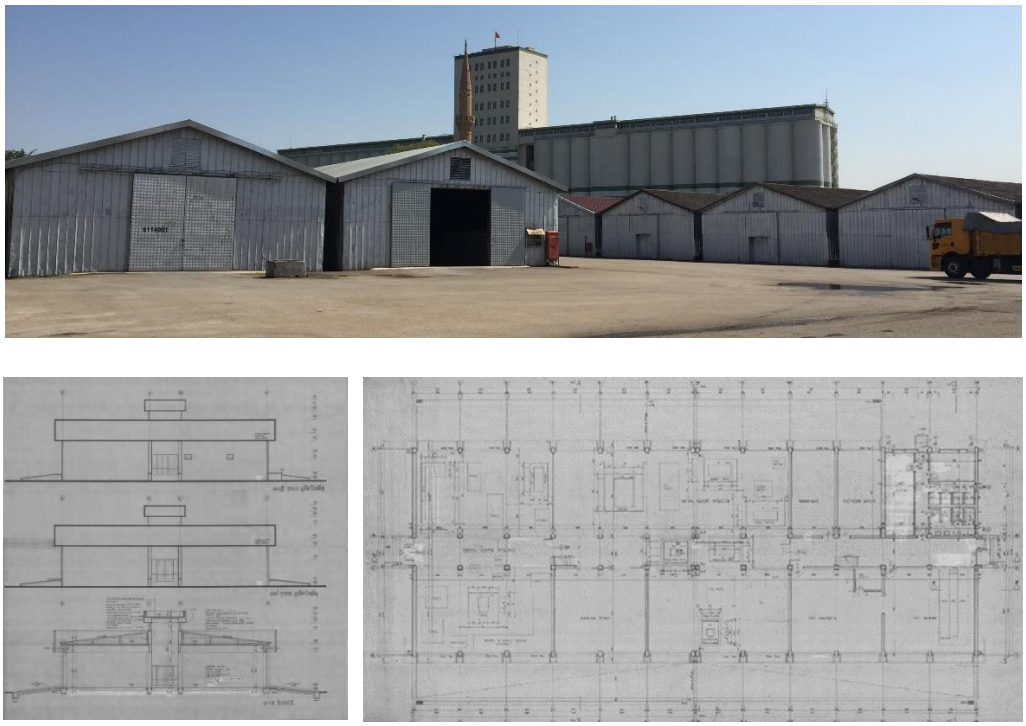


Figure 3.29. Photograph of warehouses (Author, 2020) and the elevation and plan drawings for atelier.

(Source: Turkish Grain Board Archives, 2020)

The regional directorate building was built for the administration of the TGB activities in the Ankara region; meanwhile, a new building for the General Directorate of TGB was decided to be built in Milli Müdafaa Avenue, Kızılay, in 1957 with the decision number 944/53[14].

The head office for the administration of the network and continues its administrative functions. Today, it is especially interested in poppy and opium works, including management and research. It is also a large building located near the main entrance.

[14] TGB Archives. 2201-2500.

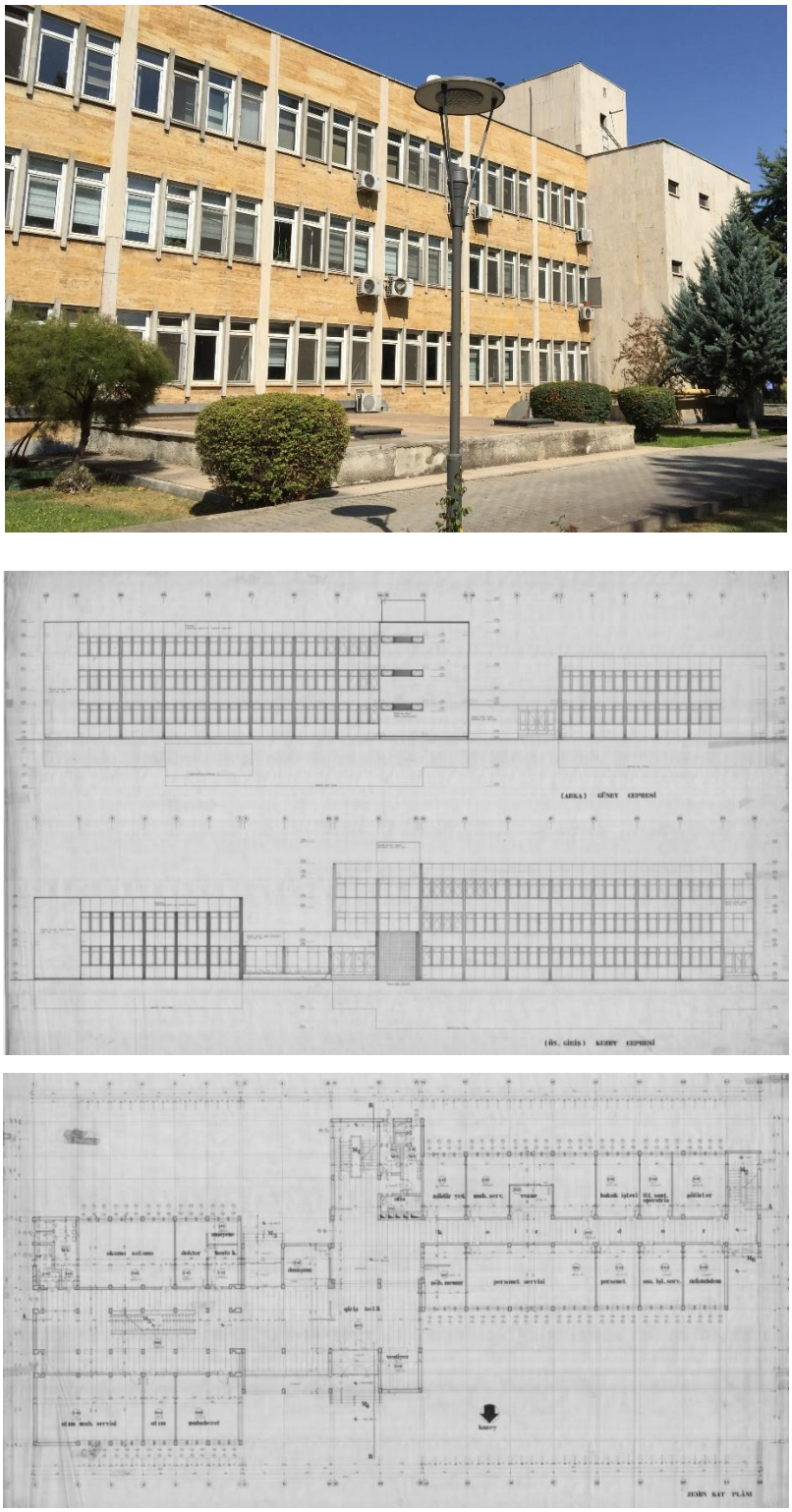


Figure 3.30. Photograph, elevation, and plan drawings for the regional directorate building.

(Source for drawings: Turkish Grain Board Archives, 2020. Photograph by author, 2020)

Turkish Grain Board is an institution with the most widespread workplaces serving even the country's most remote and secluded places. In-service training was a must for TGB, which had problems employing sufficient personnel, qualifications, and equipment from its establishment until the 1980s to carry out its services uninterruptedly at the same standards throughout the country. For this reason, training activities had to be carried out in a versatile and qualified manner. The organization decided to start the construction of the Güvercinlik Training Facilities (Yıldırım, 2019, p. 365)

Thus, the education facility was established to host and train staff from all over the country. Regular courses, seminars, and talks would educate the new personnel or further train the senior staff on agricultural research and developments within the institution. The two-story building is located next to the regional directorate building.

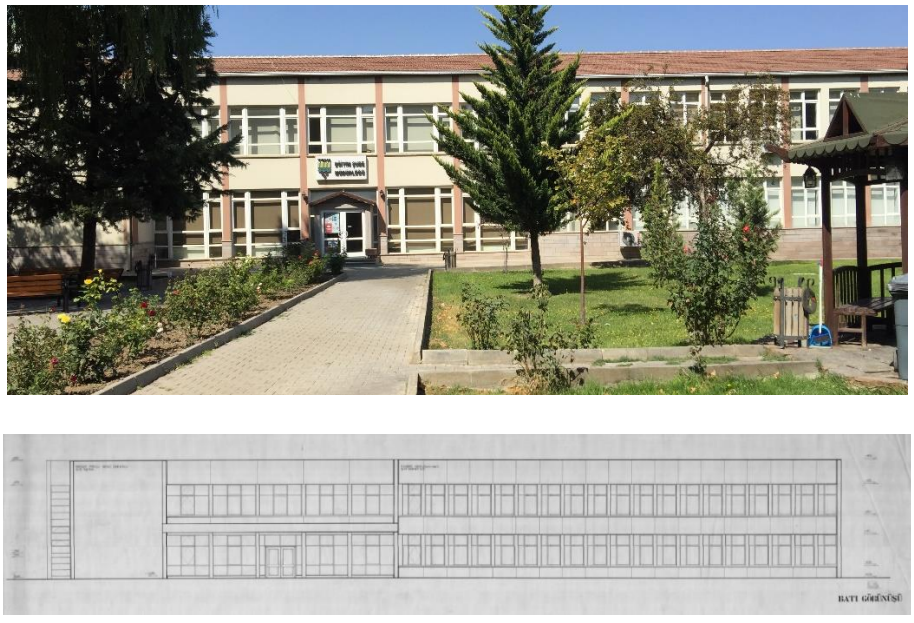


Figure 3.31. Photograph and elevation drawing for the education facility.

(Source for drawings: Turkish Grain Board Archives, 2020. Photograph by author, 2020)

There would be a need for accommodation during the visits of the personnel or other guests for educational, administrational, and research purposes. Therefore, a guest house for visitors coming to Güvercinlik for the education facility or laboratory services was commissioned. It is a four-story building and stands just opposite the regional directorate and training facilities.

Figure 3.32. Photograph and plan drawing for the guest house.

(Source for drawing: Turkish Grain Board Archives, 2020. Photograph by author, 2020)

Bread is the most basic and essential food item in the eyes of the Turkish people. TGB regulates the bread market and prices in the country. Within the framework of its activities, TGB has also engaged in bread production and sale.

In 1974, the Office Board of Directors decided to build a new and modern bread oven in the Güvercinlik facilities (Yıldırım, 2019, p. 332). This oven is built near the silo and the warehouses. Later it was used as a cafeteria, only to be abandoned soon after.

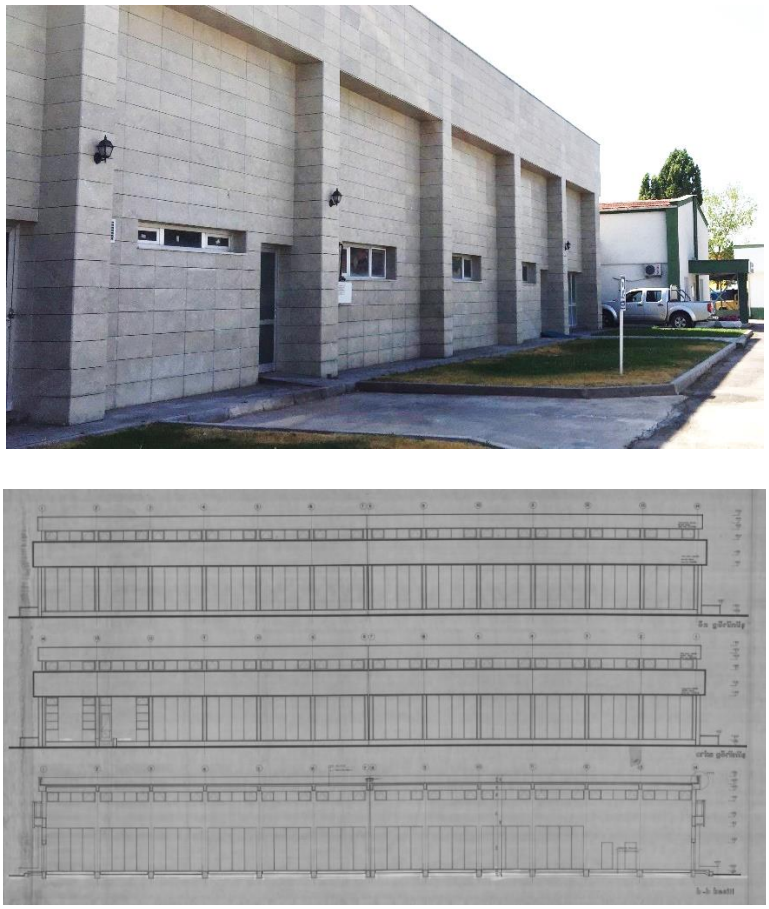
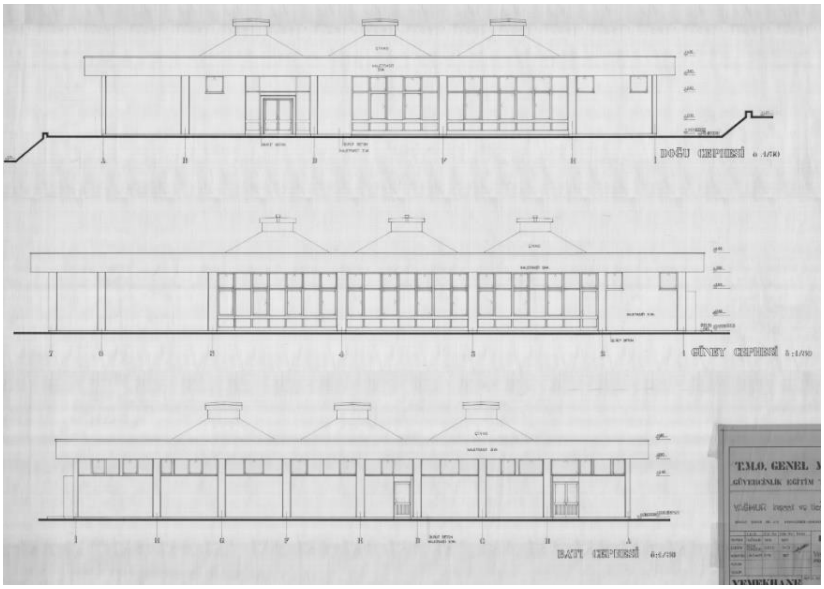


Figure 3.33. Photograph and elevation drawing for the bakery. The façade of the building has been drastically changed later on.

(Source for drawing: Turkish Grain Board Archives, 2020. Photograph by author, 2020)

Meanwhile, there is an initial cafeteria across the laboratory and near the guest house that is still working. The one-story cafeteria can be spotted easily by its square-shaped skylights and offers a spacious interior.



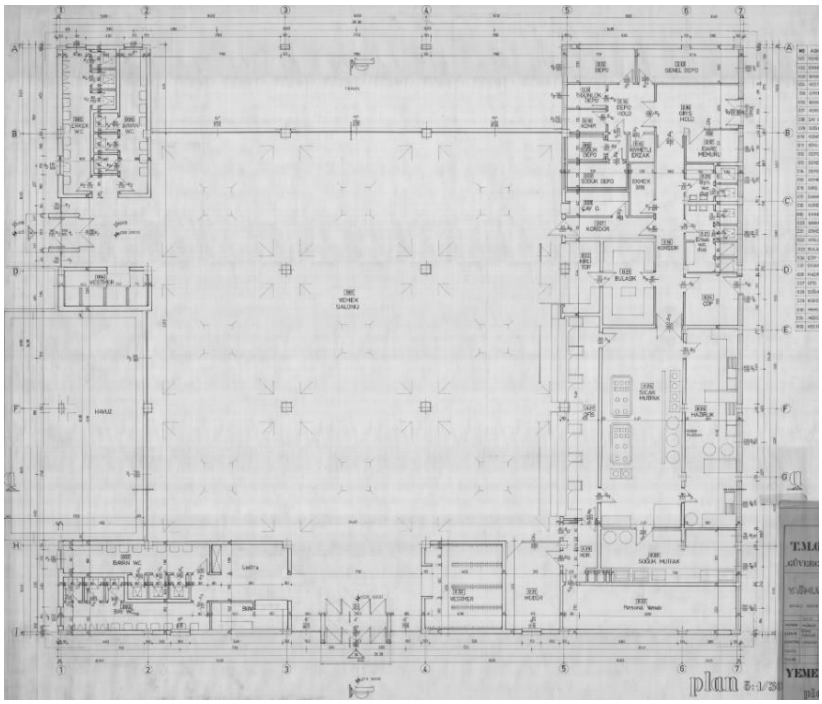


Figure 3.34. Photograph, elevation, and plan drawings for the cafeteria. The façade of the building has been drastically changed later on as well.

(Source for drawings: Turkish Grain Board Archives, 2020. Photograph by author, 2020)

The multi-purpose hall, located in the easternmost part of the campus, is the hall that was later turned and used as a sports facility. This hall could be used for many events that required gathering and showcase performances. Later additional parts for different sports were added to the facility, like the football fields.

In 1966, the ownership of a portion of the land in Güvercinlik, which is deemed appropriate, was given to the Toprakspor Youth Club, provided that it remains in the Office and is immediately abandoned by the club upon request (Yıldırım, 2019, p. 426). This club and many others used the sports facility for activities and training. The personnel and the residents of the lodgements would have access as well. Thus, this building became very important for the social life at the campus.

Figure 3.35. Photographs from top to bottom show the original multi-purpose hall building tuned into the sports facility, game fields, and an additional one-story high structure for extra interior space near the sports fields (Author, 2020).

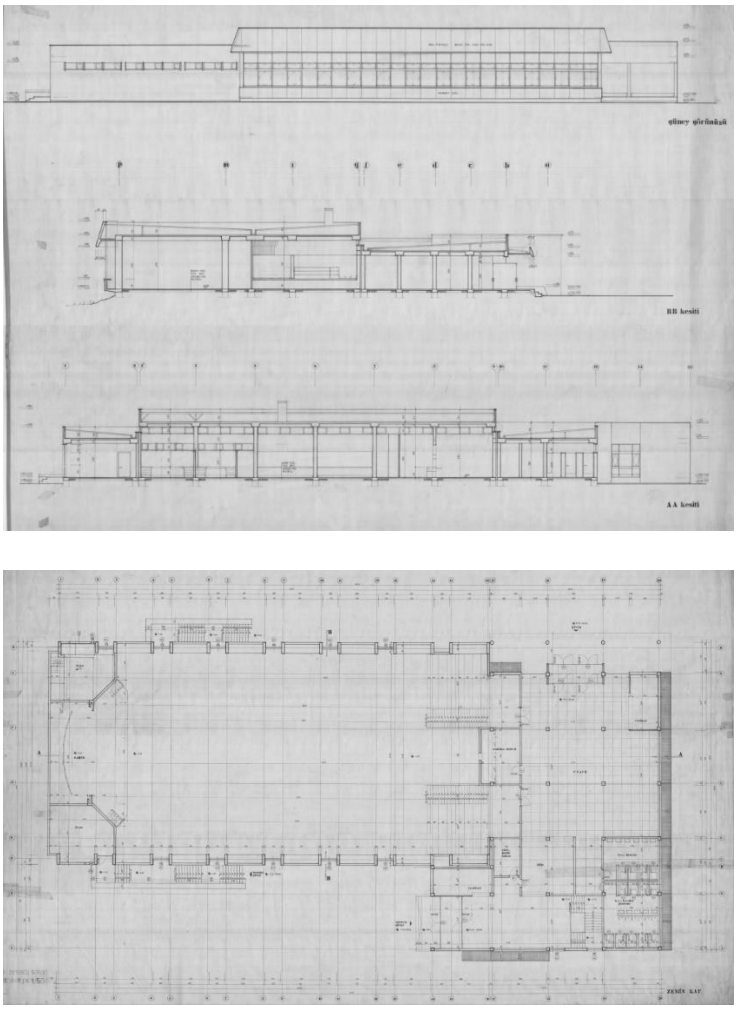


Figure 3.36. Elevation and plan drawings for the multi-purpose hall/sports facility.

(Source: Turkish Grain Board Archives, 2020)

There is also a mosque built by the Turkish Grain Board Members Social Assistance Fund Foundation, and it was opened in 1989 (Yıldırım, 2019, p. 422). However, it is not built as to how it was first intended. While the mosque had a more original and modern design in the original drawings, the building was completed as a simple structure lacking artistic intent that could be commonly seen everywhere.

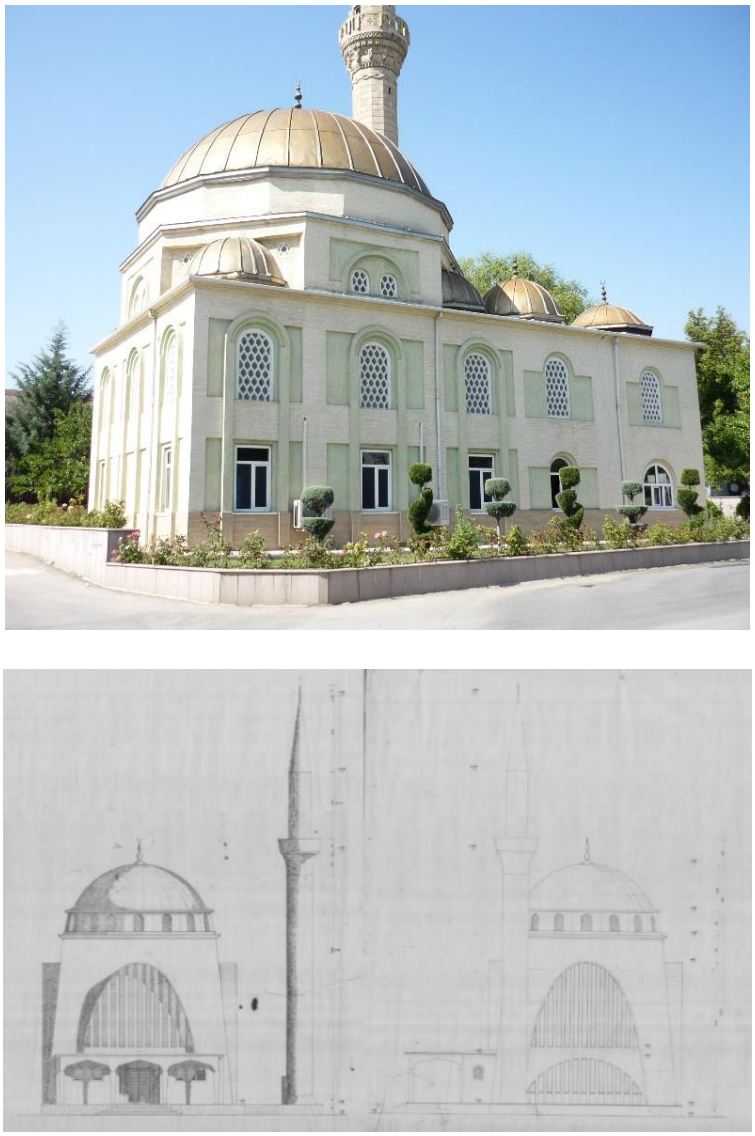


Figure 3.37. Photograph of the current mosque and the initial elevation drawings for the mosque before the change.

(Source for drawing: Turkish Grain Board Archives, 2020. Photograph by the author, 2020)

Lastly, there are three single houses and two apartment buildings for lodgements. The three single houses existed before the construction of the campus, probably built for the operating personnel of the silo since its establishment. They are one-story and rectangular structures facing the silo. The other two apartments are located at the eastern part of the silo, and they were first designed to be four in number. However,

only two apartments were constructed. They are five-story high, and their capacity is 20 houses each. There is also a playground between the apartment buildings for the young residents. Access to these lodgements is from the southern entrance of the campus.

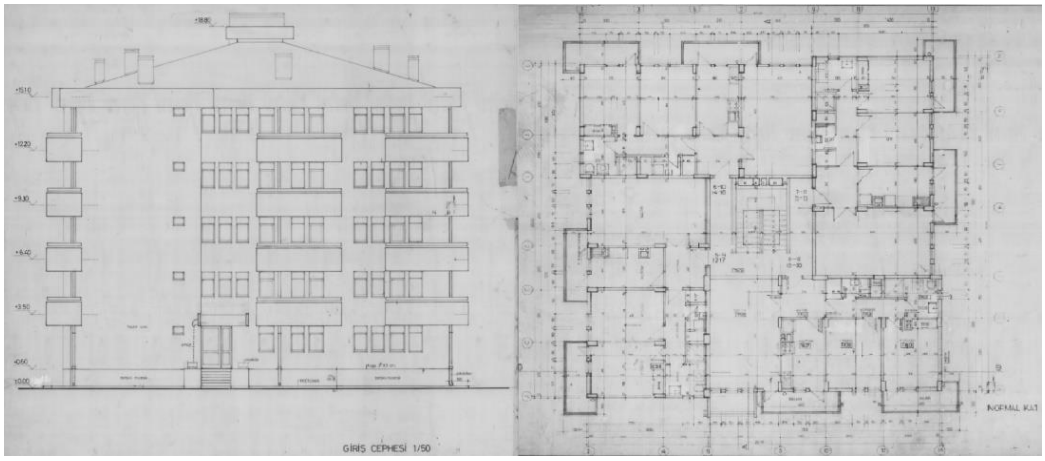


Figure 3.38. Elevation and plan drawings for the lodgements.

(Source: Turkish Grain Board Archives, 2020)

The campus slopes down from Istanbul Road towards the silo. In terms of landscaping and street elements, elevation differences and stairs are seen between the buildings. These elevations, which have ramps in some places and terraces in others, contain green areas. There are also kiosks in these areas in the garden.

Other elements include many stone flower pots adorn the stairwells. Lighting is available along the walking route with street lamps. There are two service stops, one in front of the mosque and the other on the opposite side.

Figure 3.39. Photographs of the landscape elements (Author, 2020).

The Silo stands at a distance from this lively area and appears closer to the warehouses, unsurprisingly. It needs an ample open space in the front for the large vehicles to park and collect grains. Thus, coupled with the elevation difference, a transition area is formed between the silo and the campus.

3.2.4 The Silo in the Ankara Güvercinlik Campus of the TGB

Aiming to provide the agricultural storage that the institution needed in the Ankara region during the early 1950s, TGB agreed with the company of Simon Handling Engineers Ltd. to construct a silo in the Güvercinlik area. Simon Handling Engineers Ltd. provided credit and helped lead for silo's construction, while the archival documents show that the subcontractor of the Silos was the Christiani and Nielsen Firm[15].

In order to do this, Ankara Güvercinlik Silos and Etimesgut Sugar Factory, which were both built around the same time, required energy supply during and after their construction. These facilities signed a protocol with the Etibank and İller Bank for a transformer substation in Etimesgut to be built. Sugar Transformer Substation planned to provide electricity for the neighbor settlements as well, like Kızılcahamam, Çamlıdere, Ayaş, Güdül. However, this action took some time due to the delay in the transfer of foreign currency (Decision No: 2244/35)[16]. Nevertheless, despite the difficulties, the silo structure started to benefit its environment even during construction.

At the end of this process, Ankara Güvercinlik Silo started operating and became the largest of the six reinforced concrete silos in the Ankara region. The silo, which started operation in 1958, could import 200 tons of grain per hour to highways and railways and export 200 tons to the highway and 400 tons to the railways (TMO, 1960). Thus, it increased the import and export rates of both the country and the region, which contributed to economic prosperity.

This large structure, which has become a landmark in the cityscape with its sculpturesque design, reaches a length of 200 meters, a width of 19 meters, and a height of 36 meters in the wings, and 65 meters in the middle. The silo, coupled with

[15] TGB Archives. 2201-2500.
[16] TGB Archives. 2201-2500.

its modern architectural style and use of reinforced concrete material, attracted attention due to its unique monumental appearance compared to its surroundings back then.

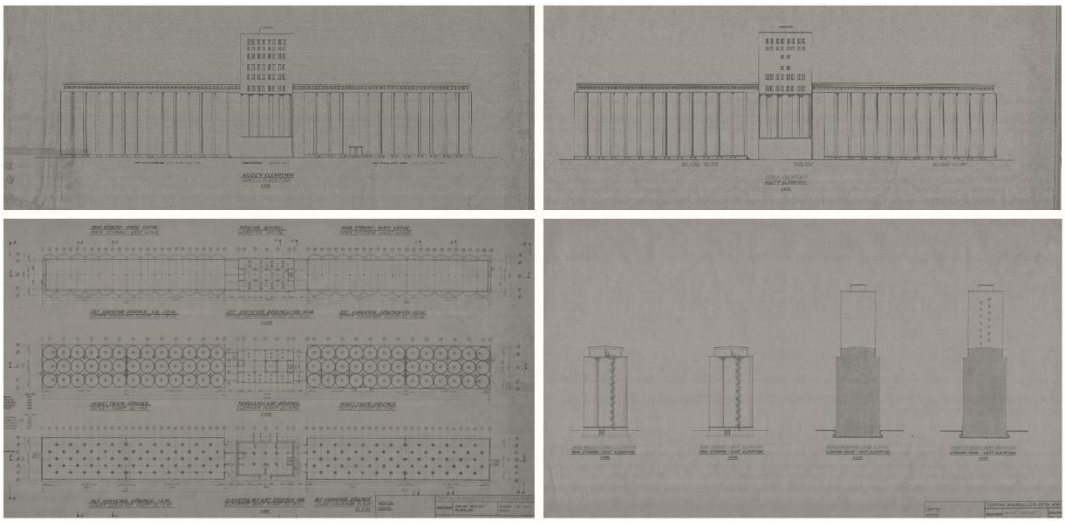


Figure 3.40. Technical drawings of Güvercinlik Silo, elevations, and plans.

(Source: Turkish Grain Board Archives, 2020)

The plan layout of the silo consists of eleven different floors, and each floor has different functions required for the storage process of the grain. The central core of the structure is more diversely loaded with work. There is vertical circulation on both ends, an elevator in the east, and stairs on the west side. The walkable terrace with a view of the city and the water tank is also in the central core at the top.

Meanwhile, the side wings of the structure are almost identical and symmetrical. These wings only consist of circular bins and conveyors from the top and bottom. The conveyor floors create large longitudinal spaces on both sides of the central core, while the bins provide slender closed spaces. Each bin is around 6 meters in diameter. In total, there are 39 circular bins on each wing and 14 shorter circular bins in the central core. There is also a circular fire escape at the end of both wings.

The required places and functions of a silo consist of an elevator pit, an elevator head, garner, weigher, distributer, upper and lower conveyors, intermediary room for engines, cleaner, and of course, the bins.

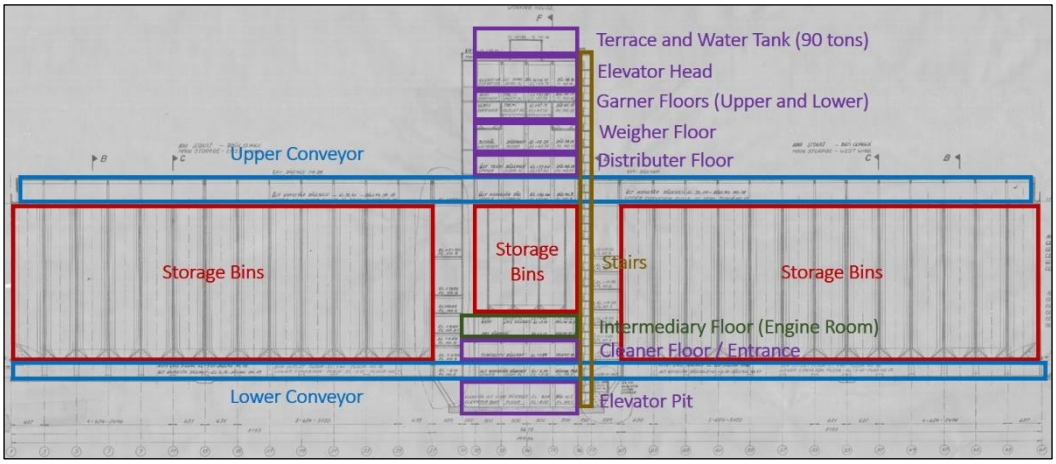


Figure 3.41. Task sharing by floor depicted on section drawing (Author, 2021).

(Source for the section drawing: Turkish Grain Board Archives, 2020)

There are two entrances for grain entry. The first is on the north façade of the central core for vehicles coming from the road, and the other is on the south façade of the central core for products coming from the railway.

The grains' journey begins with the unloading of the carrier vehicle. Grain, which is sent down from the grates on the floor, falls into the elevator pit on the bottom floor. The elevator pit, which is located eight meters below the ground level, has the machinery for grain to be lifted up from the bottom to the top inside small carrier pockets, where it reaches the elevator head. After 62.75 meters of travel, the grain runs at the height of 54.75 meters and starts going down by gravity from thereon. First, it goes to the garner floors, and after getting a certain amount according to the demand, it moves to the weigher on the lower floor. From there, it is sent to the distributer floor to be distributed by the assigned conveyors to the designated bins in

the upper conveyor floor. In the upper conveyor, grains are discharged onto belts. When the products moving on the band align on top of a particular bin, the cover is opened, and the machines pour down the grain on the band into the container.

While the grain is stored until further notice, the personnel in the engine room check on its conditions; the heat, humidity, gas release, etc. All the equipment of the silo is controlled on this intermediary floor as well. When a grain purchase happens, the required amount is released onto the belts in the lower conveyor floor. If the purchaser wants the grain to be filtered from any dirt, it can be cleaned by the cleaner machinery. Then finally, the grain is loaded into the transport vehicle.

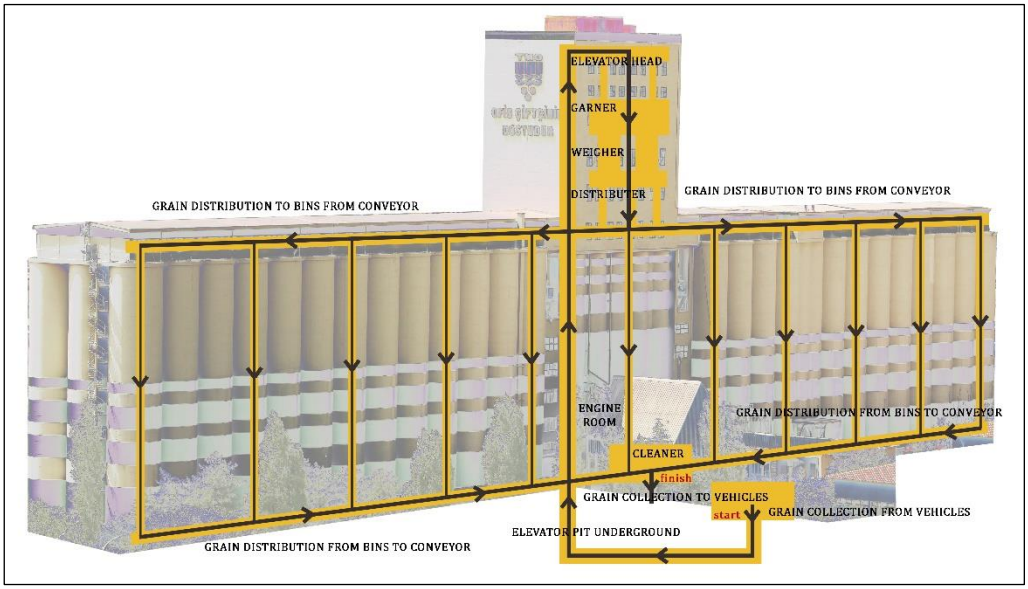


Figure 3.42. The visual shows the flow of grain through the building from its entrance to the exit (Author, 2021).

The machinery and related equipment in the building are all original. Some weighers and cleaners are not working anymore, but since the workload is not as high as it used to be, what is available is currently meeting the demand. The telephone system from the 1950s, used for the communication between the operators, is also working

well and being used. Ventilation and dust removal mechanisms on the conveyor floors ensure safety and provide a healthy environment. The elevator for human circulation of the central core has also stayed original. It has double accordion doors pulled by hand and only leads to the floors where people can enter.

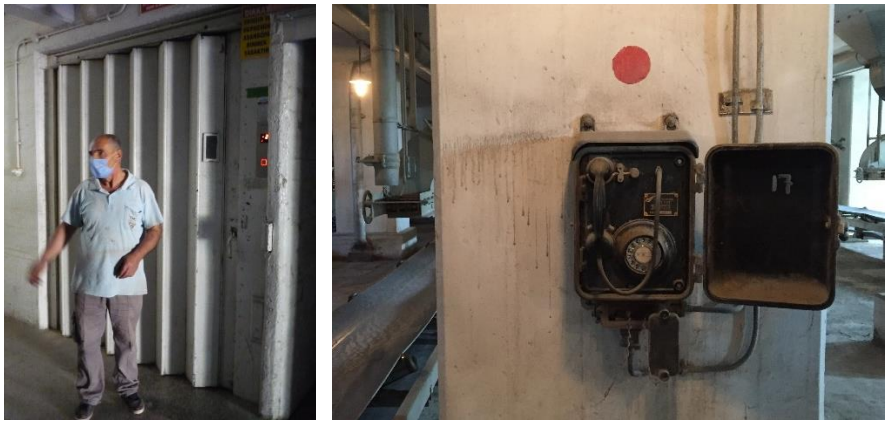


Figure 3.43. Elevator with accordion doors and an original telephone from the lower conveyor floor (Author, 2020).

Most human occupation and operations in the silo happen in the central core. Usually, seven to nine operators work inside the silo at full capacity. The entrances for both humans and agricultural goods are accessed from the ground level of the center. People can use the elevators or the stairs located at the two ends of the middle core for vertical circulation. During the site survey, only the bins in the center and the garner floors were inaccessible. The terrace is also walkable and can only be reached by the stairs. From there, the view looks quite broad. The entire campus, neighborhood, and city can be observed. There is also a water tank with 90 tons of capacity at the center of the terrace.

On the wings' side, the conveyors can be habitable by humans due to their openings on the walls and suitable height. However, the bins are inhabitable due to their tall and slender form, with no windows for light, air, or entrance except the top cover for

grain input. Even if the bins constitute the majority of the area and volume occupied by the silo, it remains a place that people cannot experience. This may also cause the structure to be perceived as a gigantic machine rather than a building.

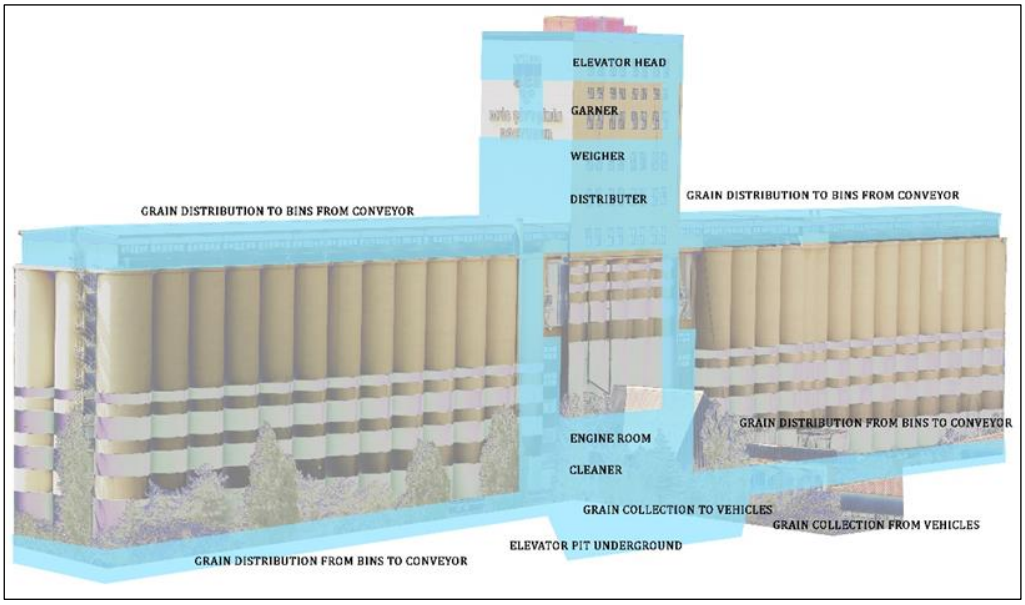


Figure 3.44. The visual shows where human movement and occupation are possible. (Author, 2021).

Architecturally, as the silo structures affected modern architecture, Güvercinlik Silo was also influenced by the modern architectural movement of its period. Its form, which follows the function, has also reflected the perception of the interior space on its exterior. Some modern forms can be observed in various structural elements inspired by the early 20th century trends. There appears reference and consistency with the architectural elements inside their designated spaces. Horizontal windows are used on the conveyor floors, which are horizontal spaces, and vertical windows are used in the vertically running central area.

On the side of the central part, where there is a staircase inside, it is illuminated by circular-shaped windows facing the bins from the west direction. It is possible that their circular forms are a direct reference to the circular plan of the bins. There are

also spiral fire ladders that have been placed next to the cylindrical bin structures. Thus, whether intentionally or not, they imitate the existing forms next to them.

Figure 3.45. Photographs show modern forms on structural elements (top) and windows in horizontal, circular, and vertical forms with spiral fire escape (bottom) (Author, 2020).

After these, the interior spatial configuration of the silo was examined in the field study. The simplified plan drawings with abstracted machinery and photographs of the floors[17] are depicted through observation.

[17] Refer to the appendices for bigger visuals of the plans.

Elevator Pit Floor (-08.00 m)

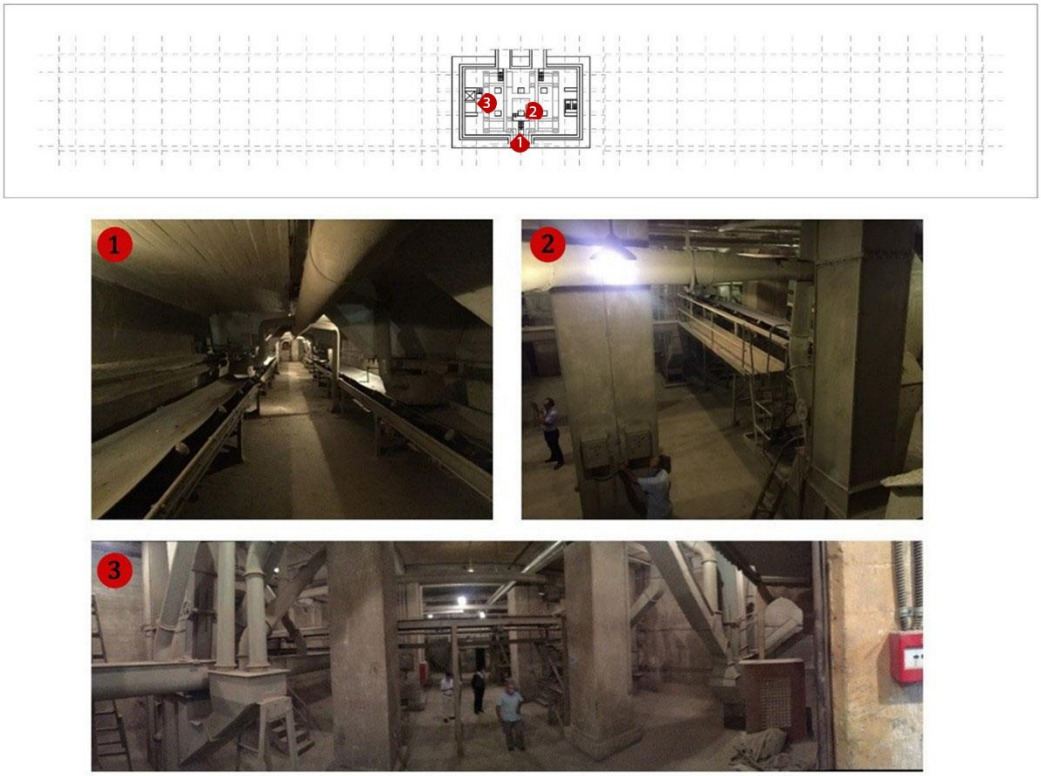


Figure 3.46. Plan drawing and photographs (Author, 2021).

The elevator pit is located at the very bottom of the structure. It is a very large space with a high ceiling, providing a spacious interior. The columns on this level are also very thick, with up to 1.40 meters of wideness, as it carries the central core with the elevator, heavy equipment, shorter bins, and even the 90 tons of water tank.

The grain falls to this level from the ground; thus, there are belts to transfer the grain to the elevators all around the room. These belts are above human height, which allows people to move freely inside. There is also a platform where the workers can climb up through stairs and check the belts coming from the part where the vehicles unload the grain.

Lower Conveyor Floor (-02.10 m)

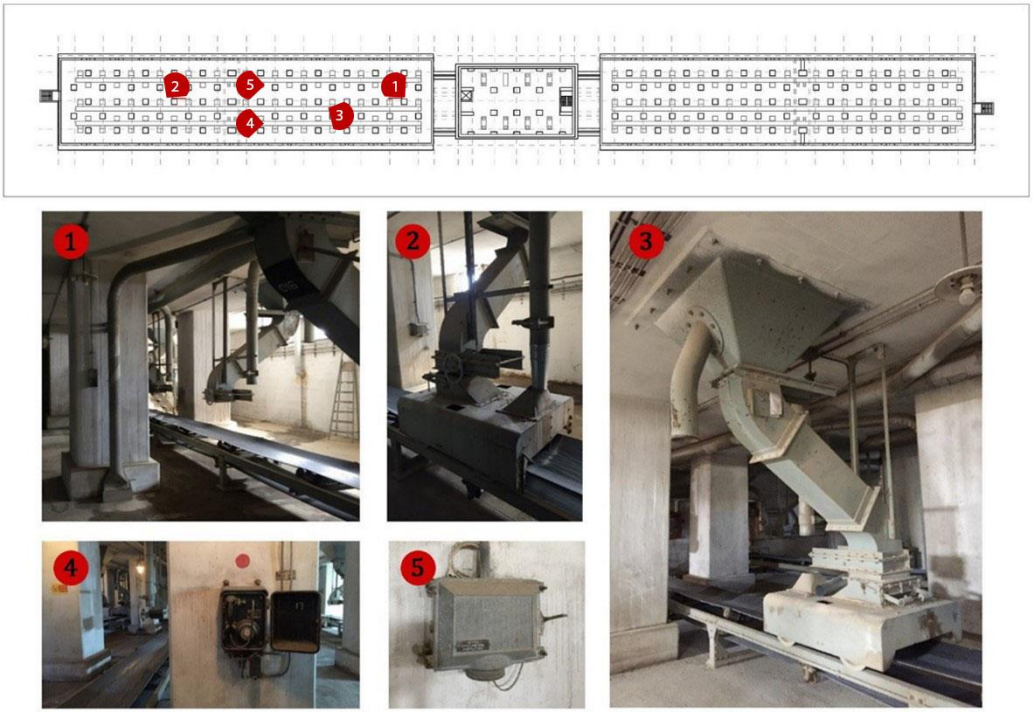


Figure 3.47. Plan drawing and photographs (Author, 2021).

The lower conveyor floor is the bottom for the wings part of the structure. It is a below-ground level space that is illuminated by narrow horizontal windows at the top of the walls. Human movement is possible on the floor, which has a stuffy room compared to the lower floor. However, due to the large columns and the waist-level conveyor belts running along the elevation, movement restriction occurs in the area.

The machinery in the lower conveyors is mobile, and either slides on the belts or has wheels. Therefore, it is a spacious place where workers can operate and move the equipment around. The columns on the wing parts are responsible for carrying the 30 meters tall bins and the tons of grain inside. That is why there are so many of them on this floor. The distance between the staggered columns is 6 meters

horizontally and vertically, and around 4-4.5 meters diagonally. Thus, every circular bin is supported by four columns on four sides.

The hopper bottom of bins, which is shaped like an upside-down cone, hangs from the end of these circular walls are not visible, but they exist on the ceiling of this floor.

Entrance and Cleaner Floor (+00.90 m)

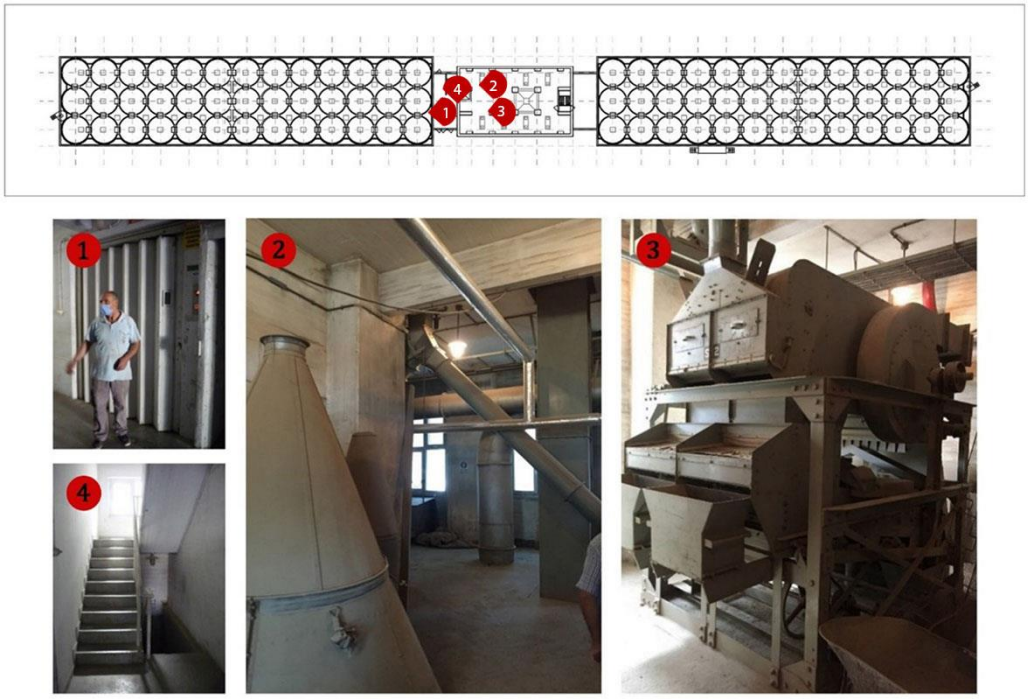


Figure 3.48. Plan drawing and photographs (Author, 2021).

The entrance to the building from the north side of the campus is through the intermediary space between the east wing and the central core. From this entrance, there are stairs right across and an elevator for people on the right. In this level, the wing parts start with the bins, but the central core has the cleaner room with machinery. These large types of equipment occupy the middle section floor and allow limited space for the workers to operate. However, the area is mostly free to

move sideways towards the windows, with the exception of four pieces of grain elevators on both the road and rail side, which will go all the way to the last floor, the elevator head, on both sides.

Intermediary Floor and Engine Room (+05.15 m)

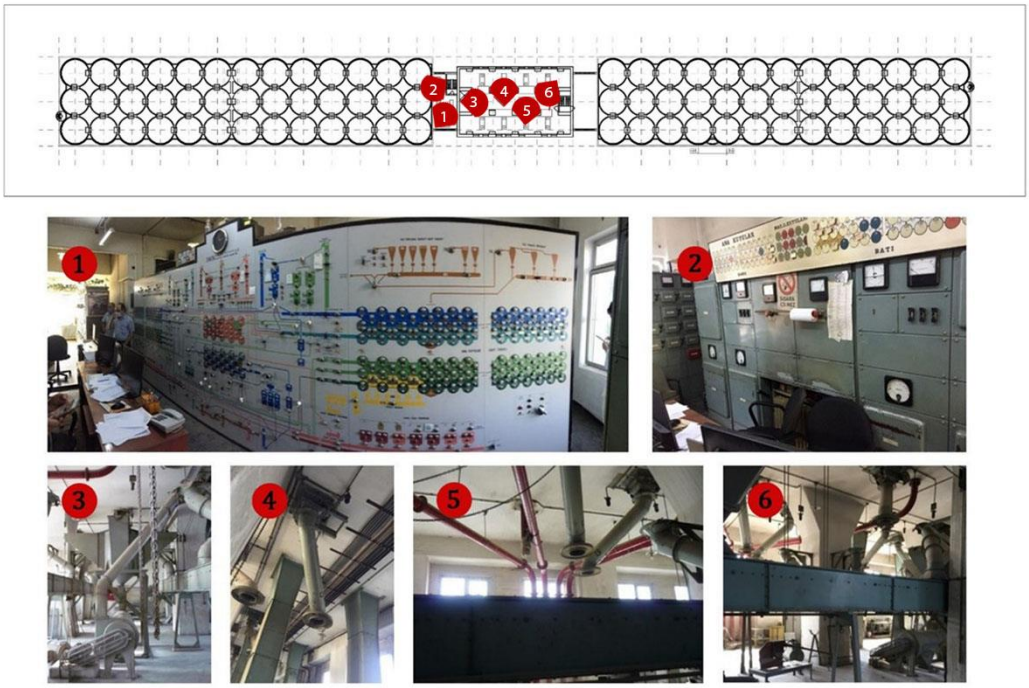


Figure 3.49. Plan drawing and photographs (Author, 2021).

The intermediary floor has outlets for the bins of the central core. These outlets are hung from the high ceiling. The crowded infrastructure is elevated from the ground and provides human movement on the spacious floor. There is no heavy machinery in the main space of the central core, but between the east wing, there is an engine room with many control panels and computers for operational work. The engine room is an office for the management team and workers to control and monitor the storage operations. There are also study desks and cabinets along with the necessary equipment for basic desk jobs.

Storage Bins (+01.40 m from wings, +09.90 m from the central core)

The storage bins start after the lower conveyor floor on the wing parts and the intermediary floor on the central core. There are four different types of bins in the structure: two types of differences in terms of plan shape and two types of differences in terms of location.

The plan shape of containers is initially circular. However, between four circular bins, a fifth one appears in the shape of a star or a diamond. Thus, a second type of bin is built in terms of the plan. The circular-plan bins have six meters of diameter, while the star or diamond-shaped-plan bins have three meters of diameter. These additional storage spaces are much smaller; nevertheless, the space is being utilized to its maximum potential.

In terms of differences due to the location, the bins located at the sides of the core are 30.5 meters tall. Their storage capacities for circular ones are 650 tons of grain, and their total number is 78 bins. Their storage capacities for the star, or diamond-shaped ones, are 160 tons of grain, and their total number is 48 bins. Meanwhile, the bins located at the central core are shorter, with a height of 21.55 meters. Therefore, their storage capacities are lower, for circular bins 250 tons of grain storage capacity, with a total number of 14 bins, and for star bins, 60 tons of grain storage capacity with a total number of 8 bins.

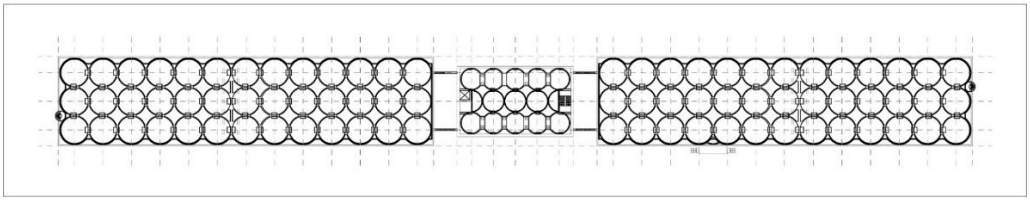


Figure 3.50. Plan drawing of the storage bins. The floor was not accessible (Author, 2021).

These containers constitute an enormous space that spans the length and majority of the height of the building. However, these spaces are not accessible to humans. Only professional climbers can access the interior from the top covers if a problem occurs.

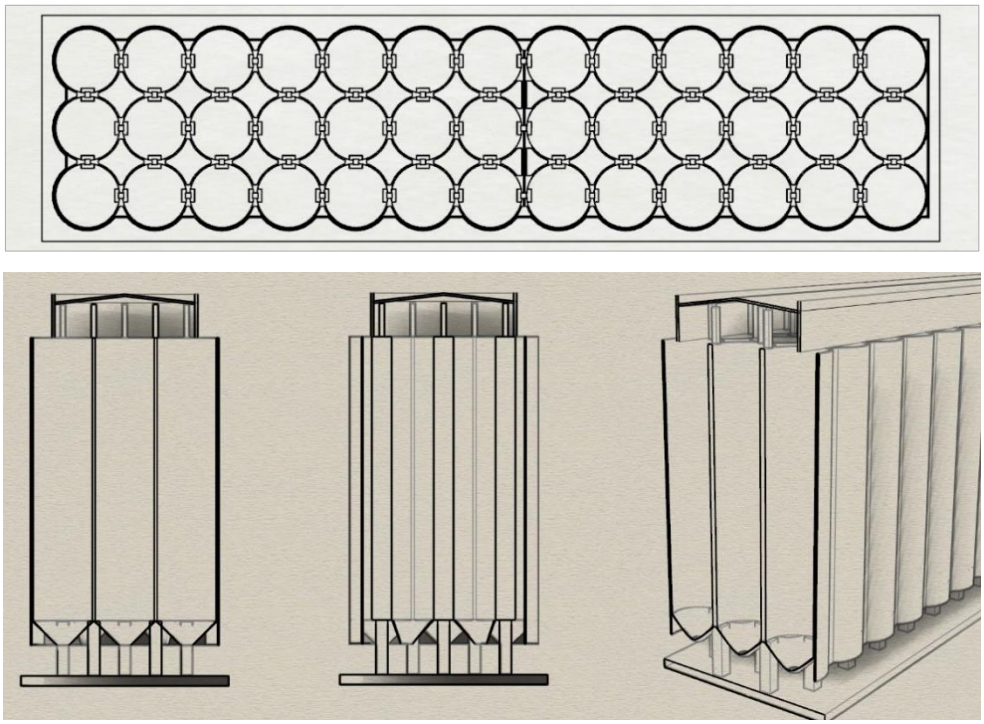


Figure 3.51. Close-up visuals of plan and sections of bins on the wing part (Author,2021).

Upper Conveyor (+32.00 m)

Much like the lower conveyor floor, human movement is easily accessible, and there are waist-level conveyor belts running along the floor. This floor is the last one on the wings part, and it is covered with a gable roof. Right below the roof, there are horizontal windows along the north and south facade of the silo.

Inside, the machinery in the upper conveyors is also mobile. But, on the contrary, the columns on this floor are very slender. Therefore, the upper conveyor floor is even more spacious than the other one.

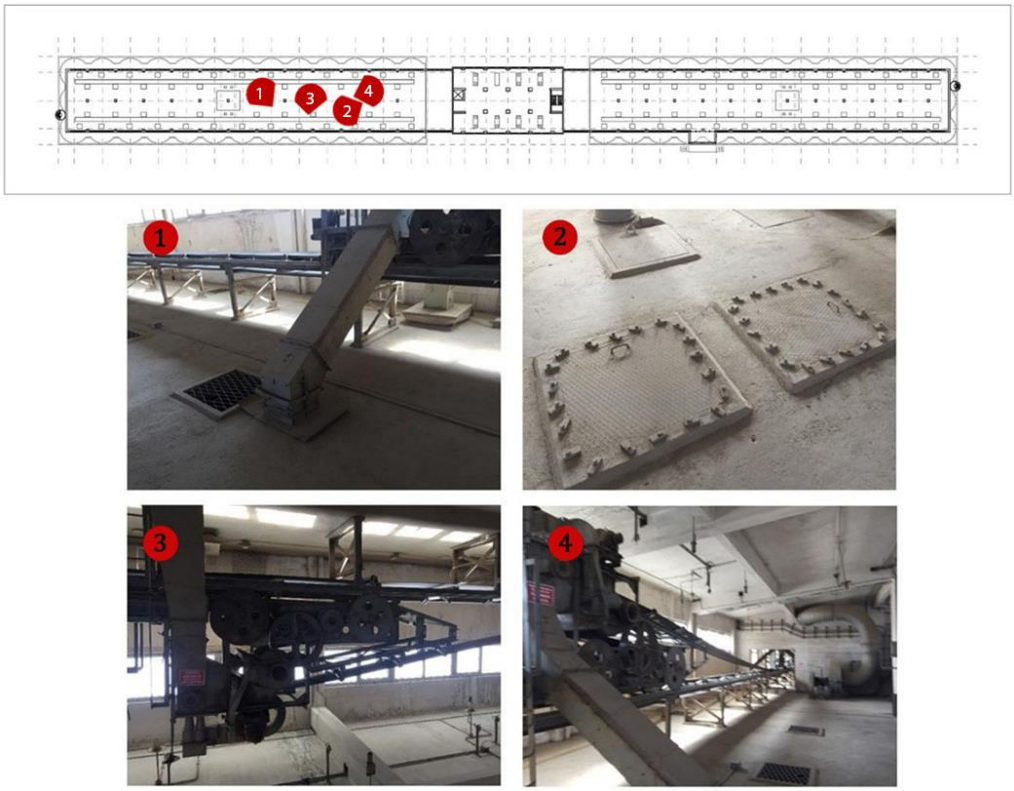


Figure 3.52. Plan drawing and photographs (Author, 2021).

All the floors above the upper conveyor floor only exist on the central core and can be occupied by people; the windows on the north and south facades of the silo are evidence of this statement.

Distributer Floor (+37.50 m)

On the distributer floor, the grain is divided and sent to conveyors. Therefore, there is no heavy machinery, but there are covers on the ground to choose from for the grain to be sent. The workers connect the equipment to the cover openings manually; thus, it provides a space for easy movement on the floor. Additionally, the equipment mandates the existence of a high ceiling.

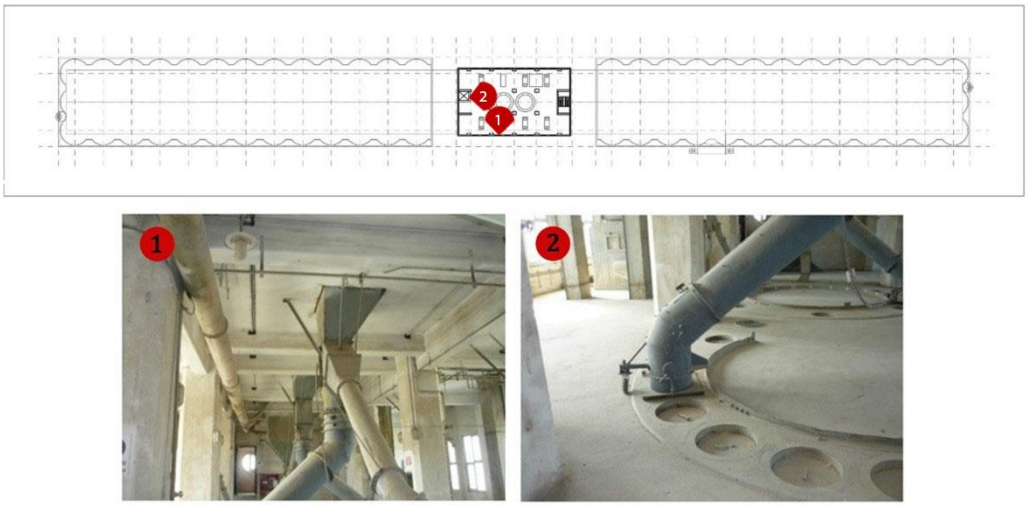


Figure 3.53. Plan drawing and photographs (Author, 2021).

Weigher Floor (+42.25 m)

The weigher floor has four weighers for grain distribution. These are huge machines used for measurement. Two of these are out of commission, and they will not be repaired due to the neglect of the railways. The other two weighers are useful enough for the current workload.

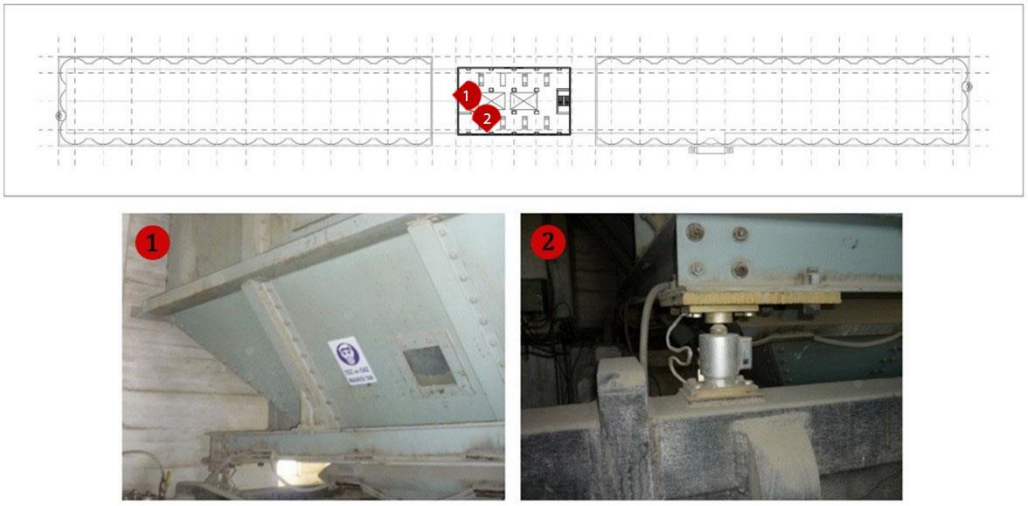


Figure 3.54. Plan drawing and photographs (Author, 2021).

Since these weighers are very big, the movement in the middle section is restricted. However, the north and south sections along the windows allow better movement due to the lack of equipment.

Garner Floor (+47.75 m)

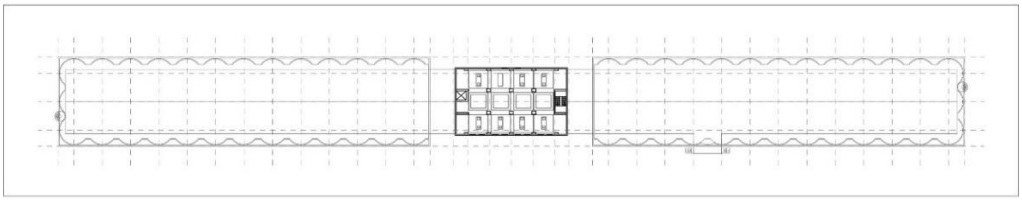


Figure 3.55. Plan drawing. The floor was not accessible (Author, 2021).

The garner floor could not be entered during the field survey. However, judging from the technical drawings and facade with windows, it is accessible and contains heavy equipment to gather large amounts of grain to be weighted.

Elevator Head Floor (+54.75 m)

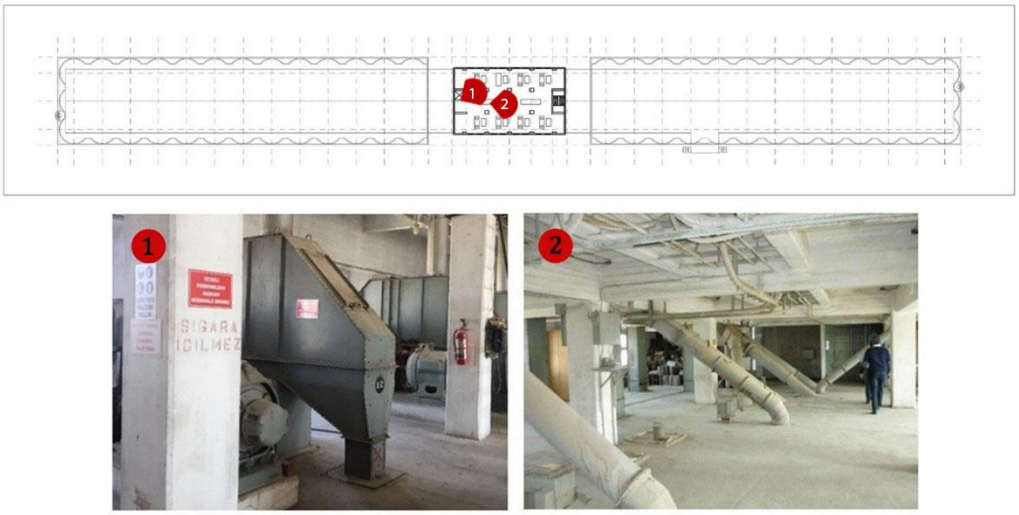


Figure 3.56. Plan drawing and photographs (Author, 2021).

The elevator head floor is the last floor of the central core. It has a very spacious interior with comparably slender columns. The inside is illuminated and ventilated with vertical windows. Meanwhile, the elevator heads are the only large equipment stationed along the longer sides, which makes the middle section free space aside from pipes.

Terrace (+59.75 m)

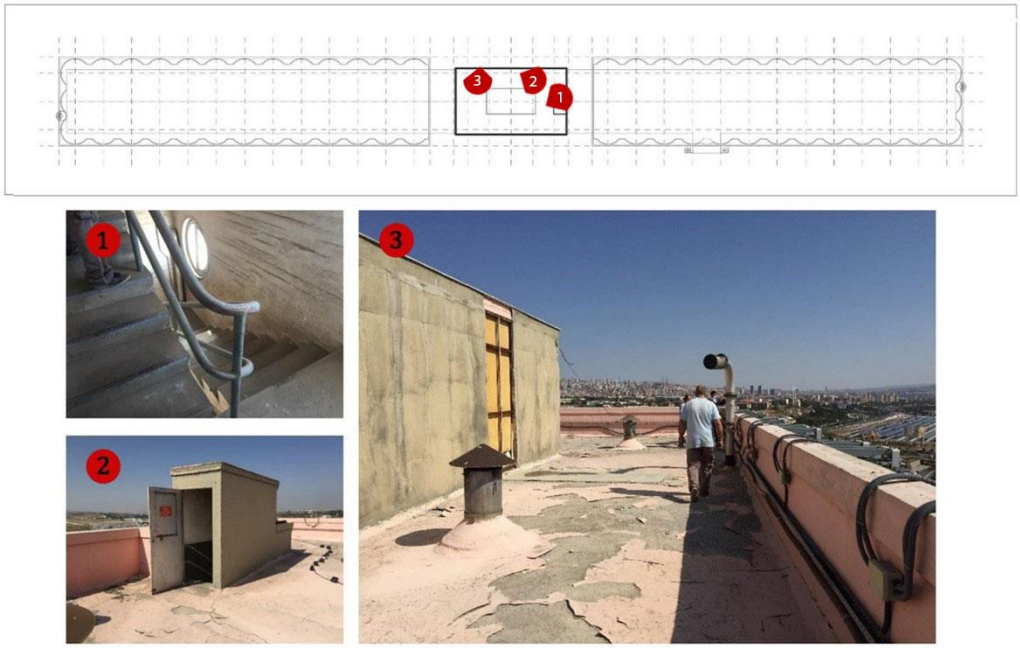


Figure 3.57. Plan drawing and photographs (Author, 2021).

The large terrace is accessed through the stairs on the west side of the central core, and it provides a view of the city. There is also a water tank in the middle of the terrace which prevents the formation of a singular space and blocks some of the views from human eye level.

3.3 Current Context and Changes in the Turkish Grain Board (TGB) and Its Silos

The characteristics of the silo structure and the current conditions of the campus it is in can only be fully understood by defining its surroundings. The effects of both the network system it is a part of and its neighborhood will affect the values, problems, and potentials of the silo.

Since 1958, many things have changed regarding the Güvercinlik Silo, campus, network, neighborhood, and storage methods in agriculture. These changes affect and reshape the way silos are perceived on a local and national scale. The silo as an industrial machine started to be inefficient, and the neighborhood went through various transformations. Meanwhile, the Turkish Grain Board embraces the licensed warehousing method for the storage of agricultural goods and reducing its burden on the public, as they claim.

Güvercinlik Silo, as a modern architectural symbol, is undergoing changes as well in the form of being alienated by its newly-built environment. From the rural context of agricultural fields owned by the Atatürk Forest Farm to the rather poorly planned and rapid urban developments of commercial and business centers, the relationship of the building with its surroundings and people deviated from its initial place.

As all these changes developed over time, the formation of each triggered one another. In order to understand the current status of the silo, it is necessary to examine the changes in the network and the effects of upper-scale decisions on nearby settlements. Afterward, an evaluation could be made considering the possibilities that come with the silo and what the campus and the urban development can offer.

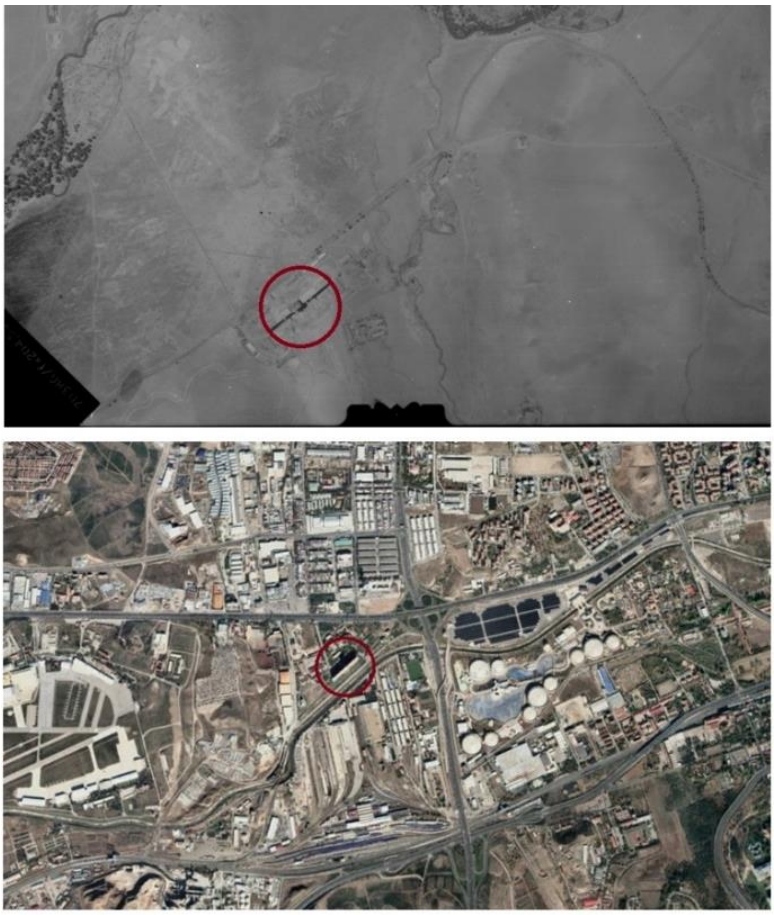


Figure 3.58. Map showing the development around the campus from 1957 to 2021.

(Source for top image: General Command of Mapping, 2021. Source for bottom image: Google Earth, 2021).

3.3.1 Changes in Storage Methods and Network of the TGB

The context discussions start with the network and the storage method decisions from the top authority figures. As time changed, the economic conditions in the countries began to shift. When the silos were invented and started to peak in their implementation worldwide, the states controlled the grain market and took responsibility for their citizens to prevent famines during world wars. However, after World War II, things changed as the governments slowly took their grip on the

market control. The silo structures, whose function began to decline since the 1960s, have started to become dysfunctional in developed countries with the rising libertarian capitalist ideas of the 1980s. In the end, large state silos were replaced by licensed warehousing implementations.

In the case of Turkey, the same method got acknowledgment starting from the 1990s. The Turkish Grain Board has a strategic development plan where they aim to expand licensed warehousing and withdraw entirely from the storage issue of grain[18].

Meanwhile, the current storage facilities of TGB are 28 concrete silos which are 11 port silos with 241.000 tons of capacity, 17 concrete inner silos with 184.000 tons of capacity, 67 steel silos with 472.000 tons of capacity, 53 semi-mechanical warehouses with 530.000 tons, of capacity, and 689 other warehouses with 932.000 tons of capacity storage. Thus, making a total of 837 structures with 2.359.000 tons of capacity available for the state (Yıldırım, 2019, p. 296). The disposal of so many buildings will constitute a major change and potential problem for the architectural functioning, institutional identity, and existing urban fabric.

Licensed Warehousing

The usage of licensed warehousing in some countries was mentioned in the thesis previously. The first practices that laid the foundations of licensed warehousing in Turkey were TGB's escrow purchases by issuing receipts in line with the provisions of the Public Merchandising Law No. 2699 in 1993. (TMO, 2019, p. 52).

In 2005, Agricultural Products Licensed Warehousing Law No. 5300 was enacted to widespread this method. However, no action was taken by the private sector until 2010. Thus, TGB took the lead by establishing TMO-TOBB Agricultural Products Licensed Warehousing Industry and Trade Joint Stock Company with a 48 percent share in 2010 (Yıldırım, 2019, p. 197).

[18] Toprak Mahsulleri Ofisi Genel Müdürlüğü Stratejik Plan 2019-2023.

Following this in 2016, to develop the licensed warehousing system and restructure TGB, work was initiated to build licensed warehousing in designated places up to 3 million tons capacity, with a ten-year rental guarantee. In 2018, the right of use was given to the warehouses within TGB for licensed warehousing activities. With this move, the renovation of existing warehouses and the construction of additional ones have been integrated into the licensed warehousing system. Within a year, the total licensed warehousing capacity has reached 2.5 million tons. This amount is expected to increase further with the warehouse constructions and the integration of the existing warehouses into the licensed warehousing system. (Yıldırım, 2019, p. 300).

TGB's website[19] states that they are currently working with 115 licensed warehousing firms and aiming to increase that number. Because it is believed to be more advanced in terms of grain control, responding to market needs, maintaining supply and demand balance, and making a contribution to employment.

Therefore, TGB plans that all physical purchase transactions regarding agricultural products should be made through licensed warehouses. Their capacity aimed to increase by 25 percent at the end of 2024 by having licensed warehouses made by the private sector by the Long Term Rental guarantee (TMO, 2019, p.15). TGB has approximately 4 million tons of storage capacity, and 3.5 million tons of this capacity are ventilated warehouses such as silos. About 1.8 million tons of this space have sufficient qualifications to carry out licensed warehousing activities (p. 62).

It is stated that with the spread of the Licensed Warehousing System, the storage costs of the institution will decrease, and the construction of the needed warehouses will be realized by the private sector. As the purchases will be directed to licensed warehouses, the need for personnel and the workload of the personnel will decrease. The expectation is that TGB's efficiency will increase as a state-owned enterprise, while its burden on public finances will fall (TMO, 2019, p. 71-73).

[19] www.tmo.gov.tr

The completion rate of licensed warehousing becoming the main storage method is between 50 to 74 percent. Investments for environmental awareness are also going to be ensured. Meanwhile, all the storage facilities in city centers are being transported elsewhere (TMO, 2019, p. 27).

In this scope, it would be no surprise that the Güvercinlik Silo might be rented for this purpose or left abandoned soon. Whichever the action would be, it is important to provide a guide for its conservation and sustainability. Additionally, the upper-scale changes in the system are assisted by local alterations, and these external factors affect the silo together.

3.3.2 Changes of the TGB Ankara Güvercinlik Campus and Silo

As the capital city, Ankara has developed tremendously over the last decades. The city expanded upon its rural settlements, and many villages became new urban quarters. One of those rural places was the Atatürk Forest Farm, thus as the growth occurred towards the western part of the city, Güvercinlik was encapsulated by a new dense urban district.

Today, Güvercinlik Silo is surrounded by commercial and business centers, specifically two shopping centers from the north and an abandoned amusement park called Anka Park from the east. On the southern side, there is the Çubuk Stream dividing Güvercinlik from the Turkish State Railways 2nd Regional Directorate and Facilities. On the west, there are several ateliers, depots, and industrial areas for small businesses.

Additionally, in the closeby area of the district, there are ten different shopping centers, other industrial sites for vehicle and machinery fixing, apartments and lodgements for the workers of these sites, and at the southeast part of the region, as if the site was not incoherent enough, the Presidency of the Republic of Turkey exist.

Figures 3.59. The top image shows the Anka Park amusement park (on the east side), and the other two photographs show the shopping centers from the north side.

(Source: Google Earth, 2021)

When Atatürk left his will, he wanted this region to be used for agricultural research and development accompanied by fields and social facilities. But instead, the urban growth of the city changed the initial purpose of the area as Uybadin-Yücel Plan failed to foresee and prevent this uncontrollable growth. (Çavdar Sert, 2017, 210). Now the silo is in a busy and comparably chaotic environment with high density in third dimension through high-rise structures of many kinds (2017, 240).

The local population changed from farmers and villagers to industrial workers, business and administrative people, shopping visitors, and other urban populations. Human movement and vehicle traffic have become heavy in the region. Thus, as expected, the silo cannot operate at its total capacity.

The perception of the silo has also been affected by this turn of events. Back then, what was mesmerizing and became a symbolic landmark to the rural communities now can hardly be distinguished from the elevated two-way multi-lane highways. Not to mention the area is highly unsuitable and unsafe for pedestrians. The shopping centers, parks, and other establishments nearby are built tall and large as well. Therefore, the monumental appearance of the silo has been diminished.

Nevertheless, the silo is still a landmark for the Turkish Grain Board as its remarkable architecture still stands tall in its iconic configuration. This is due to the existence of its outstanding sculpturesque quality located at a central area surrounded by the İstanbul Road.

Figure 3.60. The views of the Güvercinlik Silo from the highways. It cannot be perceived due to roadside afforestation and scale changes in the site.

(Source: Google Earth, 2021)

Since the construction of the silo during the late 1950s, the district has been changing inevitably. Especially from the 1980s onwards, rapid growth appears in the district parallel to Ankara’s growth as a city.

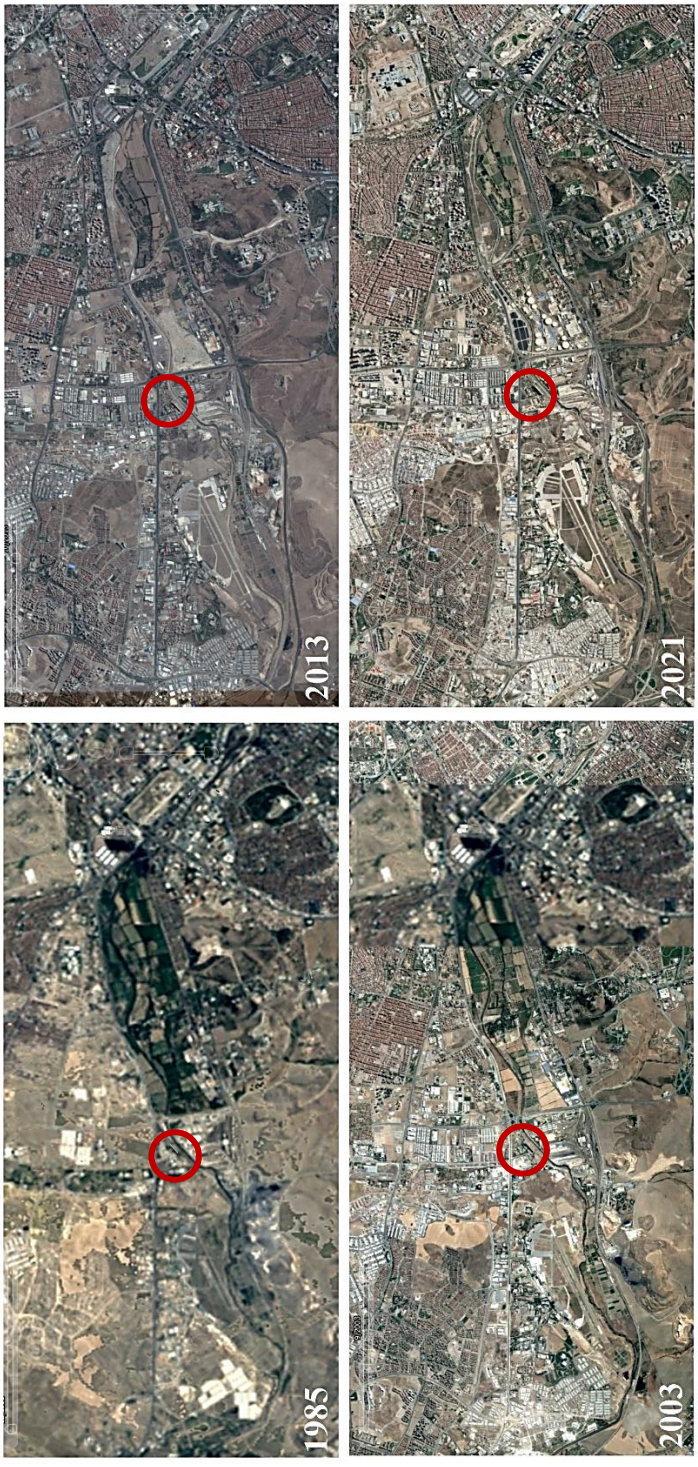


Figure 3.61. Changes in the urban tissue from 1985 to 2021.

(Source: Google Earth, 2021)

However, the most prominent changes in the context have happened within the last 20 years due to the inclination towards adopting a more income-oriented and consumption-based social and economic understanding instead of a social state.

Conversion of the silos' neighboring farmland to commercial use renders the silo inoperable and alienates it from its original site. For this reason, while evaluating the silo and making decisions for its future, it is necessary to reveal how these issues affect the values and what kind of problems they cause. Then, if any opportunity arises, what possibilities these can offer should be carefully considered within conservation and sustainable development.

The Campus

The campus was designed after the silo's construction and settled on its northern side. While the neighborhood was slowly changing, other buildings in the campus started to be constructed in the 1980s. Same years, the Turkish State Railways' Campus facing the south of the silo and other surroundings were seen to be developing from the aerial photographs parallel to the internal developments. Towards the 1990s, lodgements and the mosque also joined the complex, and the general plan of the campus known today gets to be completed.

In 2005, the grain purchase and distribution over the railway from the south of the silo were stopped. The disabled railway entry has also changed the workload balance on campus because the silo depended on the roadways more, despite the inefficient traffic as previously discussed. Meanwhile, the services provided by the campus attract personnel and visitors to enter the site for work. Thus, as the silo faces a decline in favor, the campus continues to thrive.

The Turkish Grain Board utilizes the campus for training, laboratory, research, socializing, sports and accommodation. As the needs change or increase in years, the campus stays dynamic and adapts to changes. New constructions occasionally occur, but the primary strategy observed in the site is the re-functioning of the vacant buildings by interventions.

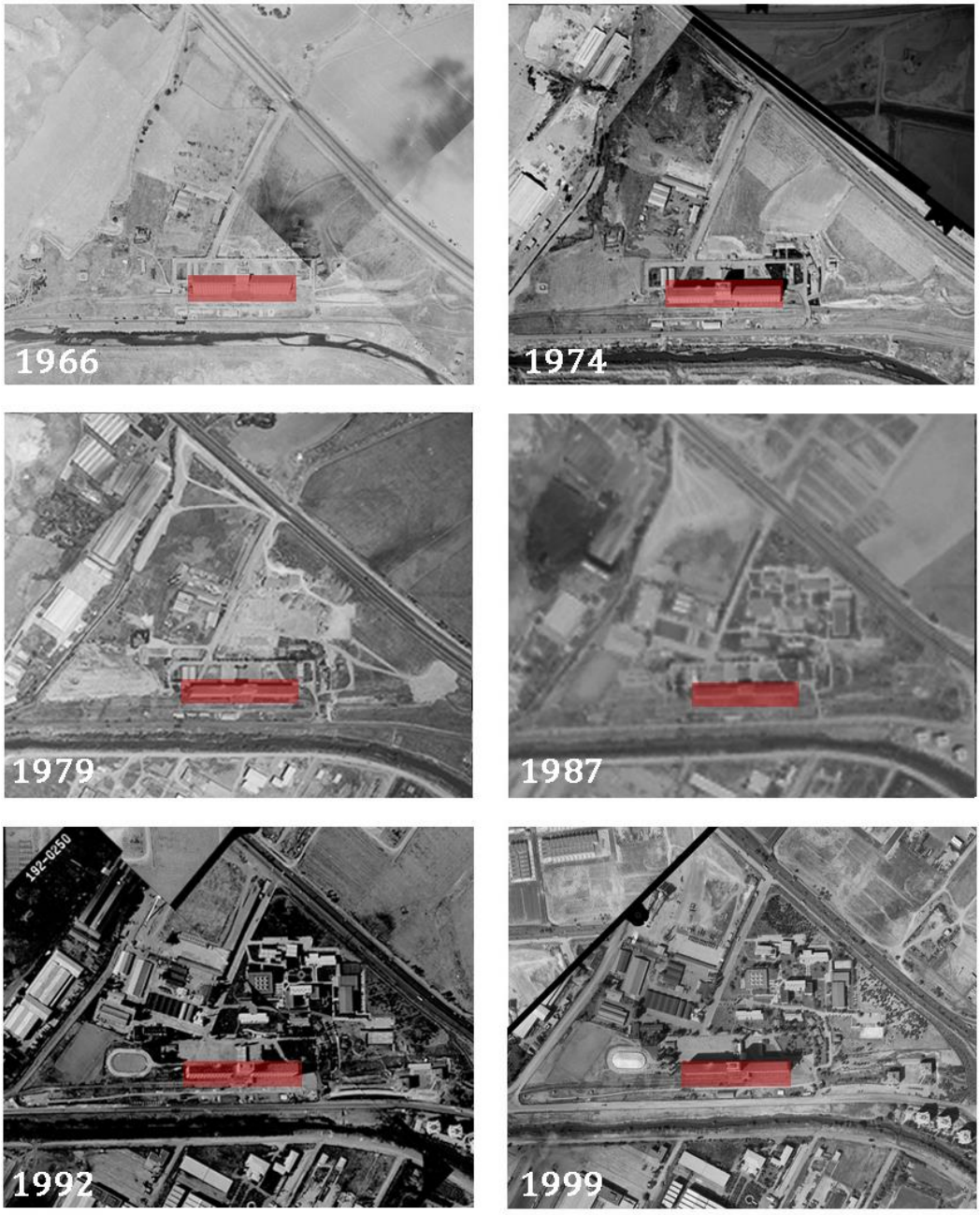


Figure 3.62. Development of the campus from 1966 to 1999 with marking on the silo.

(Source: General Command of Mapping, 2021)

Inside the campus, many things have changed a lot since the initial design. The re-functioning of structures is actually a common strategy for the settlement, as it is more sustainable to go under transformations than complete removal and construction. Nonetheless, some new buildings and facilities were recently added for new services as well.

Figure 3.63. Current aerial view of the campus with the existing functions written (Author, 2021).

(Source for image: Google Earth, 2021)

The old laboratory building has been the campus's most refunctioned structure. The building, which was designed as a branch office to accompany the silo when it was first built, was converted into a laboratory building during the construction of the campus. Afterward, the laboratory equipment was moved to a new building as it could not meet the needs and was insufficient against the technological developments in the agricultural field.

The other unused building is the old bakery. After the idea of production and distribution of bread was dismissed, the bakery structure was re-functionalized as a cafeteria. Many internal and external changes have been done to accommodate this

function, and the façade features were changed with new cladding. However, it was also abandoned and is now used for the unofficial storage of portable equipment.

Some of the warehouses and the atelier structures are also out of commission. In the workshops, the repair work of most silo equipment is not being conducted anymore since the workload of the silo has been decreased, and the licensed warehousing system is favored.

There are currently plans for refunctioning these abandoned structures again. The initial goal is to extend the laboratory services provided by the institution by refunctioning the abandoned buildings as extensions of the new laboratory. However, no concrete actions have been taken yet.

Aside from refunctionings, there are buildings whose exteriors have been altered from the original design or completely excluded during the construction phase. The cafeteria and old bakery, which was used as a cafeteria for a while, both have new claddings on their façade as opposed to the artificial marble cladding and faux stone plastered surfaces of other buildings. Their facades have been changed later and were not planned like these in the beginning. Meanwhile, the mosque and four lodgement apartments were never implemented after the initial design decisions. The number of apartments has been reduced to two lodgements, and the mosque design was completely changed from a unique approach to a more standardized look. Both of these buildings were also constructed later than the others.

In the 2000s, two completely new buildings were added to the campus. The first one was the TGB Museum. A mechanical engineer who was the branch manager and head of the Department of Technical Affairs in 2001, came up with the idea of a TGB Museum, and the museum was completed in 2008, on the 70th anniversary of TGB (Yıldırım, 2019, pp. 416-417).

Abandoned buildings: Atelier and old laboratory

Changed facade: Old bakery and cafeteria

Never implemented initial design: Lodgements and mosque

New functions: Museum from warehouse and new laboratory

Figure 3.64. Remarkable changes from the initial campus design (Author, 2020).

Later, upon expanding laboratory services in terms of number and quality, the construction of a new modern laboratory building on the Güvercinlik campus came to the fore as previously mentioned. The foundation of this building was laid in 2013 following the decision of the Board of Directors, and the laboratory services began operating in its new building in 2015 (Yıldırım, 2019, pp. 375-380).

The buildings on the campus have always been utilized in various processes, whether they are undergoing changes or not. While the campus was this flexible in its organization, the silo stayed relatively static inside and outside as the structure and the mounted equipment remained original.

The Silo

When looking at the silo, it is seen that there are not many alterations in the structure. Since its construction, the silo continues its original function and has not undergone any major intervention other than some solutions produced for the structural problems or vehicle entrance. These problems of the silo which forces the changes can be examined in two aspects of operational and physical.

As in other industrial facilities, filling and unloading operations in silos can be carried out, monitored, and controlled on the computer screen utilizing the automation system from the engine room. Grain flow planning is carried out in a fast and precise way that cannot be done manually by the operator, and the process can be controlled without the need for intervention (Yıldırım, 2019, p. 302). However, during the loading of the silo to the bins, manual operations from workers are required. Thus, the silos lack new technologies for today's conditions.

While operating with full capacity, seven to nine workers are usually needed for the workload. However, they are currently only using around 6000 tons of storage space instead of 60.000 tons. Thus, coupled with the precautions against the pandemic, only one operator was working during the site survey. The lack of operators may not be an issue for the grain storage, but the maintenance of the structure might be disrupted. The preference for licensed warehousing activities also causes a decrease

in the care and interest in the silo. Therefore, the risk of the silo being neglected and idle is the possibility that would damage the silo.

When it comes to physical alterations, the most noticeable change is the painting of the façade. According to the corporate identity guide of TGB, silo structures are to be painted with colors of Pantone 3995 C and Pantone 457 C, which are shades of green and brown. The writing of "TMO" on the facade is black and accompanied by the official logo (n.d., p. 113). These cannot be seen in the old photographs of the Güvercinlik Silo from its construction, but later they added these interventions for coherence between the silos of the network. Additionally, the TGB logo has undergone changes through the years and is different from the time the silo was built.

The entrance for the vehicles coming from the roadway has also been changed from its initial design. Instead of its original flat roof, an additional steel structure is constructed on top of the existing roof with inclined surfaces. This addition might have been necessary for loading grain in large vehicles. However, it can be argued that the decision to implement a gable roof structure creates an incompatibility with the form of the silo.

Another change affecting the silo is the material and structural deterioration. Reinforced concrete as a material requires appropriate consolidation when it starts to complete its life span. The part where this manifests itself most clearly in the building is the lower half of the bins. The cylindrical concrete surface wants to expand in its diameter due to the pressure exerted by the loaded grains. Thus, to provide integrity of the structure, it is supported by metal reinforcement parts around the bins, which are recent additions. These metal sheets envelop the lower half of bins all around and are painted in green horizontal stripes, contrasting their verticality.

The deterioration of waterproofing is another important material problem of the building. It has been observed that the insulation on the roof on both the wings and the central core has been flaking off in several spots. This may cause rainwater to deteriorate the reinforcements in concrete and penetrate inside of the building.

For maintenance, there is a project named the Silo Systems Rehabilitation for reinforced concrete and steel silos. It is conducted through Public Procurement Law numbered 4734, by the TGB Department of Technical Affairs with an open tender procedure. The organization that wins the tender carries out the rehabilitation project for an affordable fee. However, during this process, it is crucial to be careful about the values of the building and its authenticity.

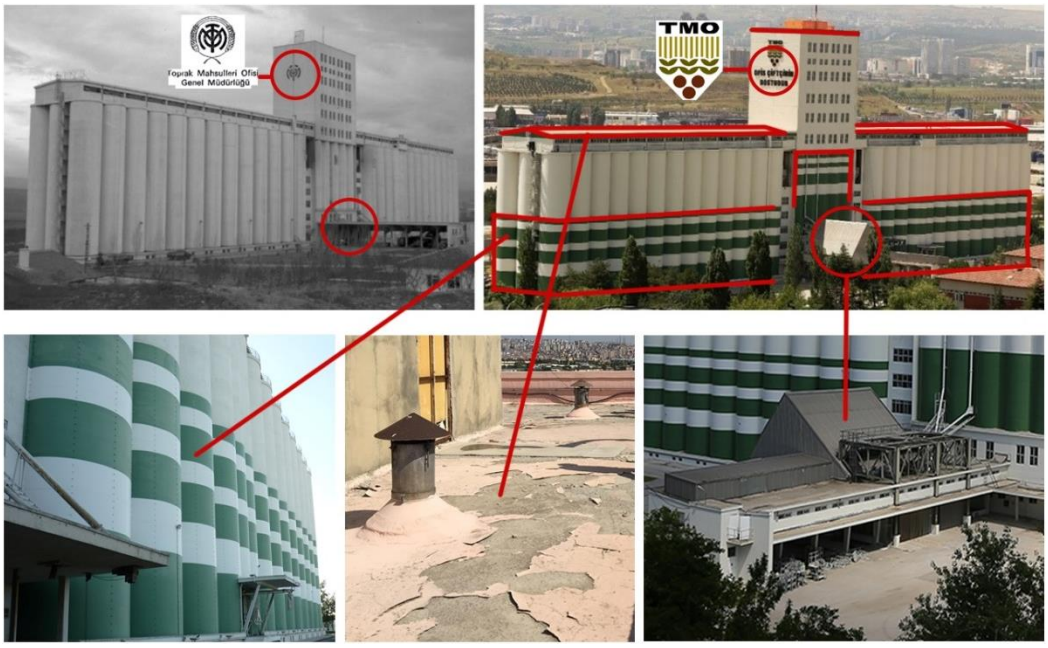


Figure 3.65. Comparison of the original façade from 1958 (top left image) with the current silo (top right image). Location of the changes: logo and vehicle entrance; and problems of the silo: water insulation decay in the roofs and structural weakening on the lower parts of the bins (Author, 2020).

In 2013, the Güvercinlik Silo was **registered as a cultural heritage** by the Ankara First Regional Directorate of Conservation of Cultural Heritage, with the decision numbered 567 in the inventory of Ankara.

The recognition of the building as a cultural heritage and obtaining a protective status is a very positive development when viewed from the research framework. However,

if the needs and demands of the said heritage are not met, physical and contextual changes and deterioration may cause it to lose this status.

In this context, all these developments offer both challenges to be solved or add new values to the silo. For the future decisions, rather than forcing changes on the structural and environmental formations that exist as a result of a process in decisions for the future, it would be more appropriate to proceed from the current situation and approach with interventions that will be a part of the process.

CHAPTER 4

ASSESSMENT OF THE TURKISH GRAIN BOARD (TGB) ANKARA GÜVERCİNLİK SILO AND PRINCIPLES FOR ITS CONSERVATION

The thesis has provided a guide for understanding the Ankara Güvercinlik Silo, from pre-silo structures to the current network, campus, and silo conditions. The letter of invitation for the re-functioning of Ankara Güvercinlik Silo from the Turkish Grain Board may have been revoked, but it is the starting point of the thesis and endpoint of the analysis. Its existence addresses the main issue of the silo: what will happen from here on? From here, the evaluation and decisions would be planned accordingly for its future and hopefully more for sustainable development.

In the light of the guide provided until this chapter, the common and specific values of the silo at all scales, together with its problems, needs, and potentials, should be evaluated. Then, this evaluation will lead to the determination of its significance.

The significance will shape the attitude towards interventions and alterations in the structure. The vision for the determination of the principles will be formed through its significance to ensure the basis of the conservation plan is its values.

To ensure the future alterations would not stray away from this vision, principles and strategies for the conservation and management plan of the silo should provide regulations that are strict in terms of sustaining values but flexible in the creation of space generation. Furthermore, the decisions could be helpful for the development of sustainable solutions and resilience against changing climatic conditions as the grain storage structures had done in the past.

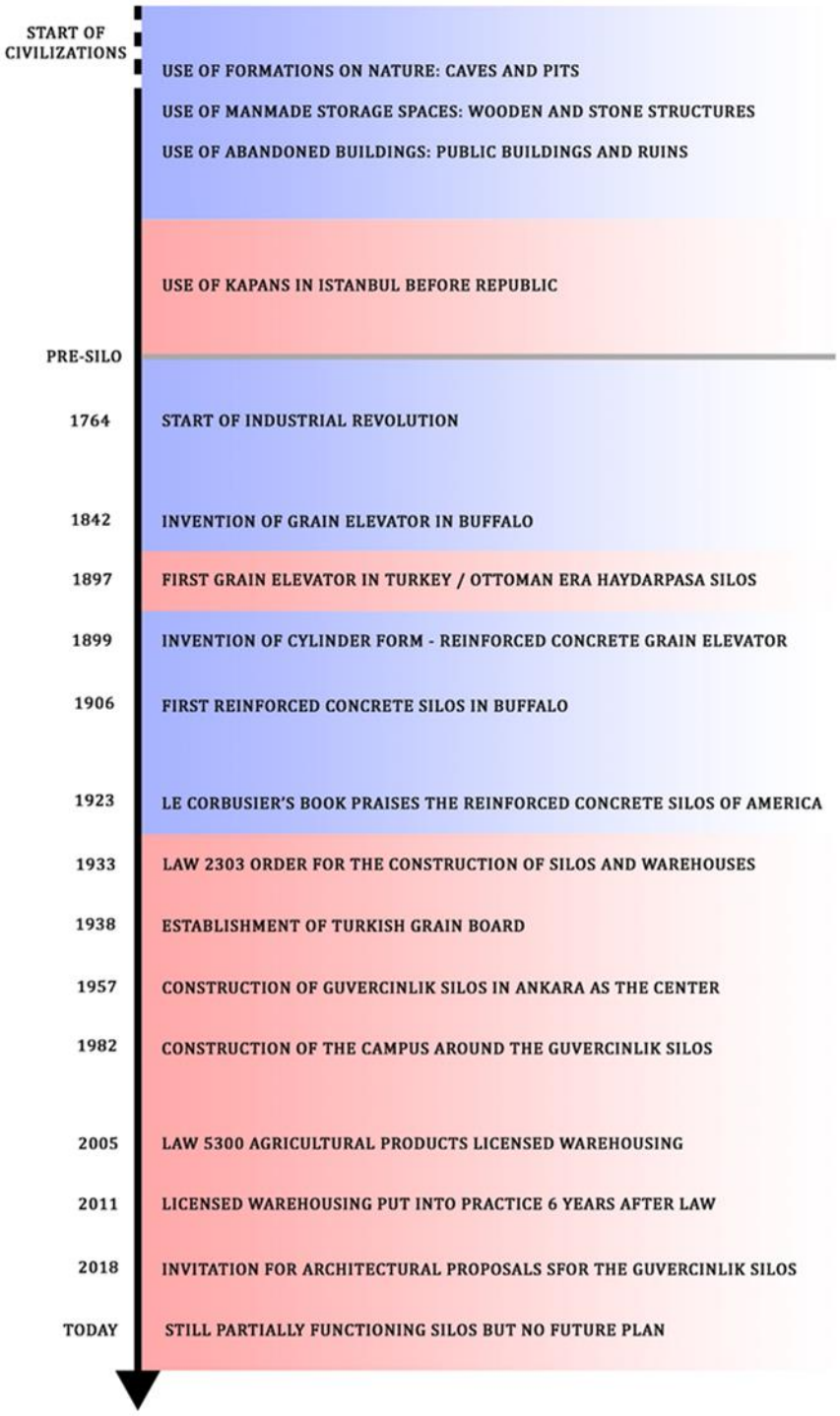


Figure 4.1. Timeline of important events regarding the silos and Güvercinlik. It starts from pre-silo structures to the letter for project invitations for the Ankara Güvercinlik Silo (Author, 2021).

4.1 Assessment of Values and Problems

In site management, the feature that distinguishes heritage sites from other properties is that cultural heritage management aims to protect the values attributed to an area because the values attributed to them justify their conservation. The support or constraints that the building will receive also depends on this basis (Clark, 2001, p.5). Therefore, values at every scale will act as both the paths and restrictions for the management plan.

Meanwhile, identifying problems leads to the determination of needs and speculation on potentials. Problems can harm the values of the silo, but with the right strategies, they can be utilized as potentials that can increase the existing values and add new ones. Therefore, to form the statement of significance that sums up the entirety of the structure, it will be necessary to evaluate both values and problems of the system.

The volatile economic environment, which once made the pre-silo structures dysfunctional and increased the demand for the silos, now renders the silos dysfunctional. With the spread of free trade and governments withdrawing from commerce for the public, early state granaries were re-functioned as halls, barracks, prisons, and such (Erkal, 2020, p. 17). In this context, seeing the transformation of silos today can be interpreted as the flexible character of large vague spaces in granary structures. However, this idea only applies if the perception of silo structures is limited as a single building devoid of a context.

Silo structures initiate physical and visual relations with railways, roads, stations, service buildings, immediate landscape, and built environment. Therefore, when understanding the site and developing conservation and reuse proposals, their local context cannot be ignored. The relationships between the silo and its surroundings may change over time and cause alterations in the visual perception of the silo, which presents a major problem for the silo (Landi, 2019, pp. 54-55).

Furthermore, the ideological symbolism goes far beyond the local context. The values of the Güvecinlik Silo start from the nationwide system and organizational

cause of the Turkish Grain Board. Thus, the assessment of values and the opposing problems of these values starts from the network scale and then narrows down to campus and building scale as they get more specific.

4.1.1 Values and Problems of the TGB Ankara Güvercinlik Silo in Relation to the Network

In the network scale, the identity of TGB and the relationships between means of transportation and spatial links of other silos emerge as the subjects of conservation.

It is challenging to make concrete decisions on this scale due to many factors outside the thesis's scope involving government policy and the national economy. A conservation management plan for the whole network would be the desired approach at this step to ensure the whole system transforms for the silos nationwide. However, since the scope of the thesis focuses on the Güvercinlik Silo only, it is best to limit the actions to formulate suggestions that answer the needs of the silo at hand.

Otherwise, an organizational restructuring in TGB and reevaluation of the economic tendencies within the government are somewhat unattainable or out-of-reach goals for the future plan of one silo.

Therefore, the values and problems of the network mentioned in this chapter aim to evaluate the Ankara Güvercinlik Silo. At this scale, the impacts to which the silo is exposed can be classified as social and economic. The history of Turkish rural and industrial development and the formation of the Turkish Grain Board identity are the most significant values in terms of social and economic aspects; because these values separate the Turkish silos from other examples in the world by replacing their neutral object feature with a national identity. The silos' purpose is to serve their regions and communities. As there are still-functioning silos, just like Güvercinlik, the network continues to contribute to the said ongoing purpose, which implies that it still holds its existing social and economic values in this regard, just lesser due to changing policies.

The economic values provided by the silo network and the Turkish Grain Board as an institution to the society and the state can be summarized as its contribution to the grain trade in the country, the advantages it warranted for the competition in the international market, the advanced storage facilities it offered and the economic measures it provided against difficult situations. In addition to these, the institution's continuous follow-up of new technologies and the research and implementation of new storage and distribution methods show the network's pioneering character in this field.

Meanwhile, its social values focused on the humanitarian aspects of the Board. The network, which always considered the benefit of the society in its approaches, aimed at easy access to grain and bread and has also helped communities under challenging times. The institution, which took on tasks for the development of the rural area, had its share in the modernization of the society. In addition, TGB maintains various social activities and aid policies within itself, and the network has become the spatial organization in which these policies occur.

Problems of the network include both adverse effects of organizational decisions and urban growth in settlements. The biggest visible shortcoming is the lack of a structure-oriented conservation management plan for the future of the silo network. Silos that are abandoned or privatized when they fall out of use risk losing their values starting from social and economic ones because they are vulnerable to change from lack of monitor and control. In addition, silos that the urban growth have swallowed cannot fulfill their functions and lose their economic impact or intended perception in the neighborhoods. Losing their perception causes silos to lose their place in social life and collective memory.

Furthermore, urban growth causes silos to become distant from the rural landscapes and, in some instances, it causes the campuses of the silos to disintegrate. This would eventually lead to the loss of the social life and customs in the subject campus.

Perhaps the most significant problem the network faces is the implementation of licensed warehousing, which puts large silo structures out of commission. Thus,

leading them to deteriorate due to low maintenance. Even the still-functioning silos are working less nowadays because of the decreased workload due to the detachment from the railway transportation for grain transfer. All these happenings cause losses mainly in the economic value of the network.

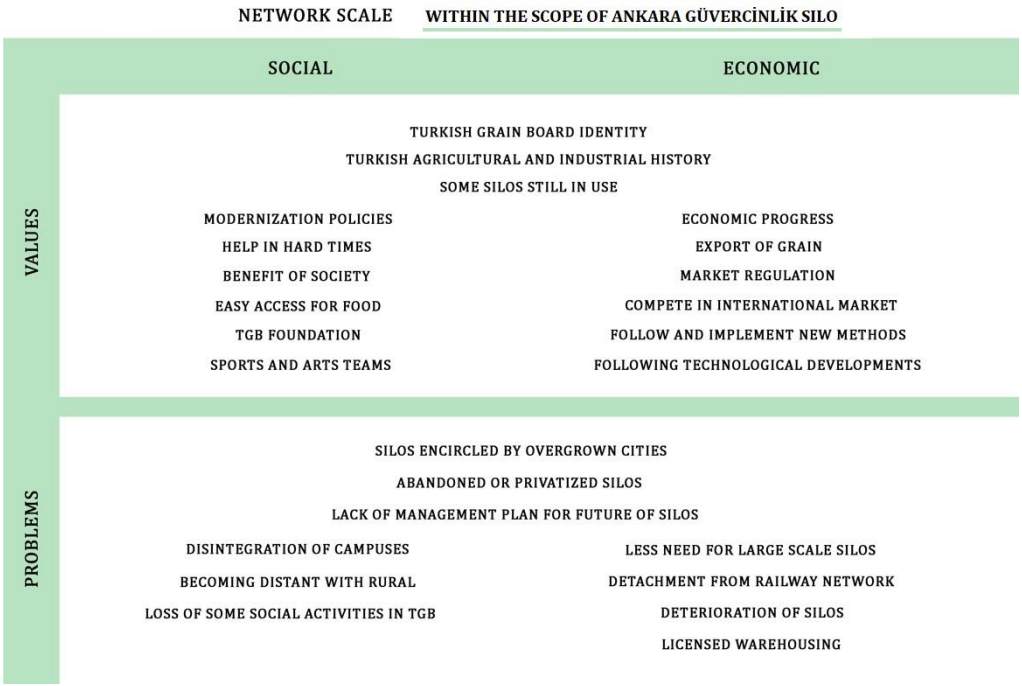


Figure 4.2. Values and problems of the silo in relation to the network (Author, 2021).

When looking at the current conditions of the values, occurring changes and problems affected some of them to lose their scope or initial intent. In this situation, the values can be divided as continuous and disappearing depending on their relevance. Continuous values start with the institutional identity of TGB as a public economic enterprise since it has never left its line of work. Silos have an important place in the history of agriculture and will always be referenced for their contributions. Therefore, their place in agricultural history will always be relevant. Modernization policies and implementation of developments are also a part of this aspect. However, the more private sector and licensed warehouse methodology in

agriculture are applied, the more TGB's values as a network disappear. The benefit of society and assurance in hard times becomes secondary over financial decisions as the market regulation and trade activities are being transferred to third parties. Thus, it is crucial to realize that TGB and the network of silos should prioritize the community of producers and consumers.

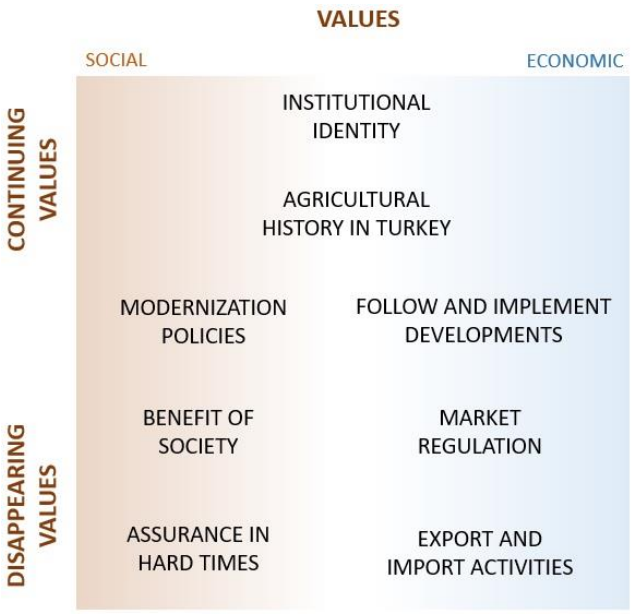


Figure 4.3. Continuing and disappearing values of silos in relation to the network scale (Author, 2022).

4.1.2 Values and Problems of the TGB Ankara Güvercinlik Campus

On the campus-scale, the silo's relation with its immediate surroundings is crucial. These include the campus settlement, nearby settlement, transportation, traffic, users, connections with the city and the spirit of the place, genius loci.

The silos in the network have shared values and problems, but the regional and contextual values of the campus distinguish the Güvercinlik Silo from the others. Its

problems also offer more complex and specific challenges requiring a comprehensive solution that extends from silo to the district or even the city.

In terms of values, it is essential both socially and economically that the campus is located in the old Atatürk Forest Farm and that the campus, which acts as the center of the network, is still in operation. The campus has many facilities, workers, and residents; thus, it provides an active social life and even customs like iftar to some extend. These facilities also enable various services for the farmers and producers, adding more social value to the site. Additional to the benefit of people, these services are essential for agricultural research and lab analysis. This enables the rural production and storage to be made better and compensates for the economic value of the campus. The creation of this rural industrial site affects the district it is located economically as well by attracting trade activities and commercial mobility to the neighborhood.

Alongside its values, various problems appear primarily because of urban developments. First of all, the transformation of Atatürk Forest Farm from agricultural lands to a busy commercial district makes the site lose its core values socially and economically. It changed the place from rural to urban and altered the site's users, too, from producers to consumers.

Currently, the site is disconnected from the city because of the alterations in the district. The roadways and the lack of walkways are blocking access for pedestrians. Its nearby built environment consists of unrelated shopping centers and a deteriorating amusement park. The campus is not easy to notice due to elevation differences on the northern side. Coupled with the loss of customs in the campus life due to the administrational changes causing spontaneous decisions have resulted in the loss of many social values.

Moreover, since the district became a commercial one, the traffic type went from agricultural vehicles to many varieties of cars, and the density increased. Since the railways are not being used, the campus and silo rely on roadways that can no longer easily accommodate large vehicles for grain transfer and harm agricultural economic

values. Due to these circumstances, the major alterations and abandoned buildings would also become an economic burden on the already financially suffering campus.

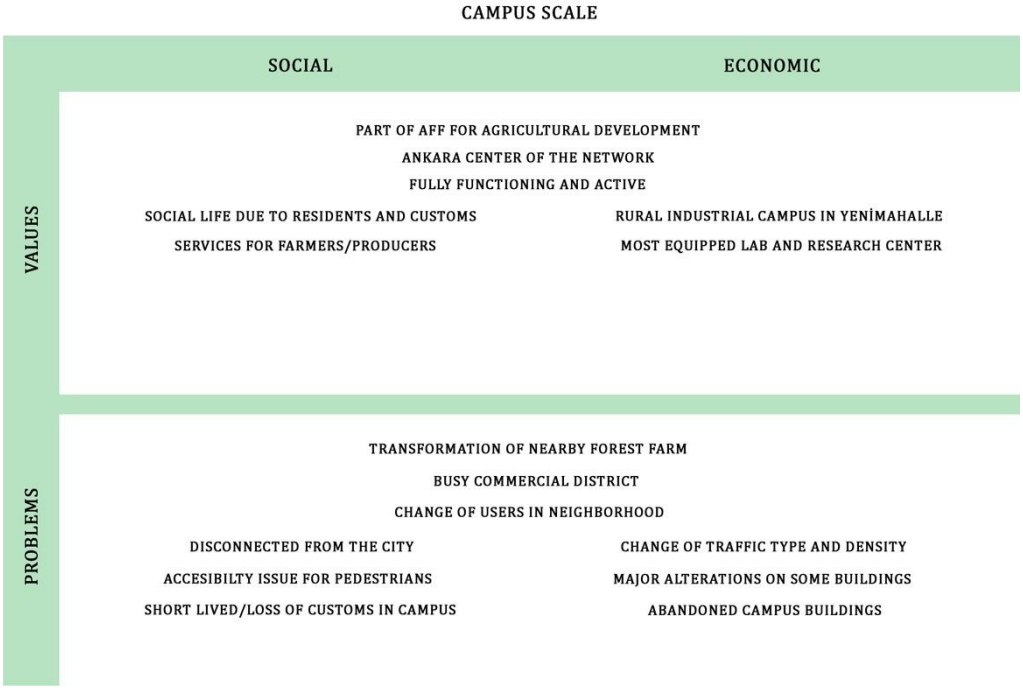


Figure 4.4. Values and problems of the Güvercinlik Campus (Author, 2021).

Regarding the longevity of values, the campus's agricultural development is still a current and essential value as TGB continues to execute its training and research activities inside the campus settlement. Therefore, it is an actively used and lively place for the personnel, workers, and residents as well. These agricultural research and laboratory analysis activities are carried out to serve the producers. Therefore, it can be said that the campus continues to serve the producers to this day, and these values are continuous values of the campus.

On the other hand, some values of the campus are disappearing due to the changes and problems. The biggest issue is the loss of agricultural fields and AFF lands vanishing from the neighborhood. As the farming fields and, therefore, the site of

agricultural productions in Ankara goes extinct, the campus becomes an isolated parcel, devoid of its initial context. This issue of the campus, coupled with the threat of abandonment of the silo, diminishes its value as the center of the network. Meanwhile, even though the campus is still actively used, the loss of customs and traditions puts the existing social life of the campus at risk of loss in the future.

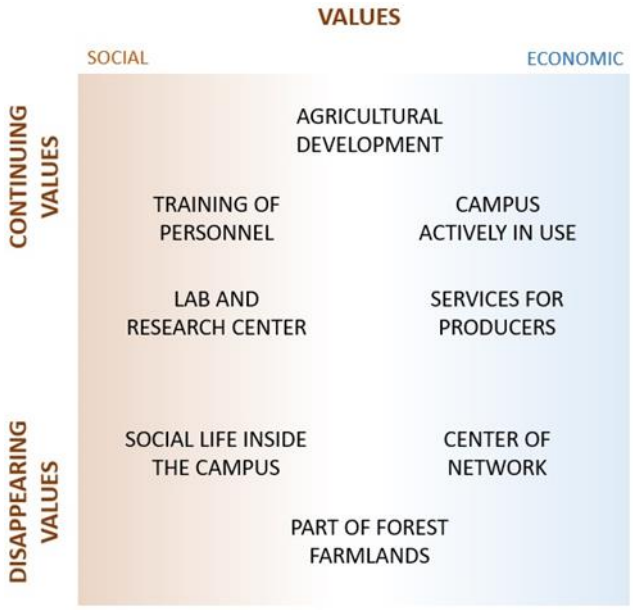


Figure 4.5. Continuing and disappearing values of campus (Author, 2022).

4.1.3 Values and Problems of the TGB Ankara Güvercinlik Silo

The images of silos, whose names and engineers are unknown, had passed on from place to place and traveled across the world like an object for consumption. This produced a mobile architectural understanding which can migrate globally. Thus, silos appear as an incarnation of capitalist views (Moreno, 2019, p. 61-104). However, their identities and values get to be reshaped by their contexts.

Moreover, grain elevators and silos seem to be affecting various groups in different ways depending on the time. In the past, the economic prosperity and the sense of community they brought were valuable for the farmers, elevator operators, and the townspeople. Although it may have evoked more emotions for the operators, such as a sense of accomplishment or even some fear due to general hazards in the work environment of industrialization, it brought a sense of identity and belonging for the people. However, in the present, a sense of loss has replaced those feelings. Pride for the accomplishments or indifference to the elevators are common for the townspeople. Meanwhile, the operators may experience an annoyance at the outdated technology and think it is useless (Piwowar, 2016, p. 84).

Previously, during the reframing of the silo conservation issues, the values of the silos were discussed within the thesis' scope. Nevertheless, due to its context, the Ankara Güvercinlik Silo gains more value in different aspects than only those common values.

Technologically, the original equipment and machinery of the silo are preserved and still in use. It can compete against the developments in the field as much as possible, even if it is relatively outdated. Also architecturally, the structure is almost unchanged except for minor visual differences in paint color and the TGB logo on the facade. It stays as a rural and industrial landmark in the city. Agriculturally and economically, the silo shares the values of the network as it contributes to the modernization of the communities in rural Ankara and provides opportunities in global trade affairs. In terms of rural and industrial means, it acted as a bridge between the underdeveloped rural life and developing urban settlements in Ankara, contributing to the developments of both sides just as planned initially during the Republican era. It also becomes the spatial representation of the TGB's institutional identity and growth in the agricultural industry.

Historically, as the center of the network, its contributions to the modernization and rural development process in both the region and the country are impossible to miss and very valuable. Silos cause no contamination, and there is not much workforce

needed. Therefore very few workers might experience inconveniences, but compared to other types of industrial sites, the Ankara Güvercinlik Silo remains harmless. Thus, these structures are relatively neutral for the workers as well, aside from a possible fear of mechanization and deep-dark bins. Another value that affects in a social way is the aids for the public during the hard times. To this day, TGB controls the grain market but, alongside the grain, it provides many various necessities when needed. The silo and its campus help shape the built environment around them as well. Because when it was first built in the late 1950s, only agricultural lands, railway, and the Istanbul Road existed. Then as time went on, urban development had to be formed around it. In terms of documentation of the rural and industrial heritage, the silo is undoubtedly significant; thus, it embodies a spatial form for all these values.

In a more comprehensive and shorter manner, Ankara Güvercinlik Silo, like other silos, has an architectural value due to its common features that helped shape modern architecture and has a technological value because it uses the technical developments of the period such as elevators and other machinery for grain storage and becomes a historical document in the timeline of agricultural storage methods.

However, along with these, there is an agricultural value that aimed to improve the economic and social conditions of the country and the neighborhood precisely due to its location and identity of the Turkish Grain Board. Historically, as a part of a network, the silo worked to benefit rural society and production. Thus, the silo becomes a landmark for these attributes and gains a symbolic value associated with its sculpturesque character. The symbolism comes from the structure becoming the spatial manifestation of all the ideologies the state envisioned for the developing nation in terms of financial power following societal modernization.

The problems of the Ankara Güvercinlik Silo show similarities with most other silos in the world and Turkey. Loss of monumental perception and changes of scale, rapid urban growth, unsuitable and dense traffic are a few to name. There is also the thread

of abandonment and privatization due to changing storage methods accompanied by the under-capacity work with low maintenance for the silo.

When it comes to the physical problems on the silo, there are two major material and structural problems: the deterioration of the water insulation and the weakening of the reinforced concrete on the lower half of the bins. This damages the architectural value of the silo by shortening the lifespan of the structural material and puts the silo at risk of evacuation by mass and material loss.

Additionally, the strengthening metal layer on the lower half of the façade has horizontal-strip paintings that do not align with the vertical character of the bins. TGB might have decided to paint all their silos in certain colors. But the use of horizontal lines on the vertical bins causes a reduction in the perception of its monumentality and harms its architectural and symbolic values.

Another issue would be the inclined roof of the vehicle loading part, which looks incompatible with the whole structure due to its form. The silo consists of basic prisms and geometric forms with a flat roof or gable roof with the slightest slope. However, the vehicle loading and loading part on the north façade has been altered due to necessities. The new steel structure is constructed on top of the existing flat roof with a steep slope and creates a gable roof that disturbs the façade.

The problems of the silo in every scale directly or indirectly affect its values. These can be further explained by dividing them into two groups of continuous and disappearing values. In terms of architectural and technological values, both the common and specific aspects of the silo emerge as the continuous values of the structure as the building itself and equipment remained original, and the silo still stands as a rural and industrial landmark on the cityscape. This inspiring form and material would stay as long as there are no interventions.

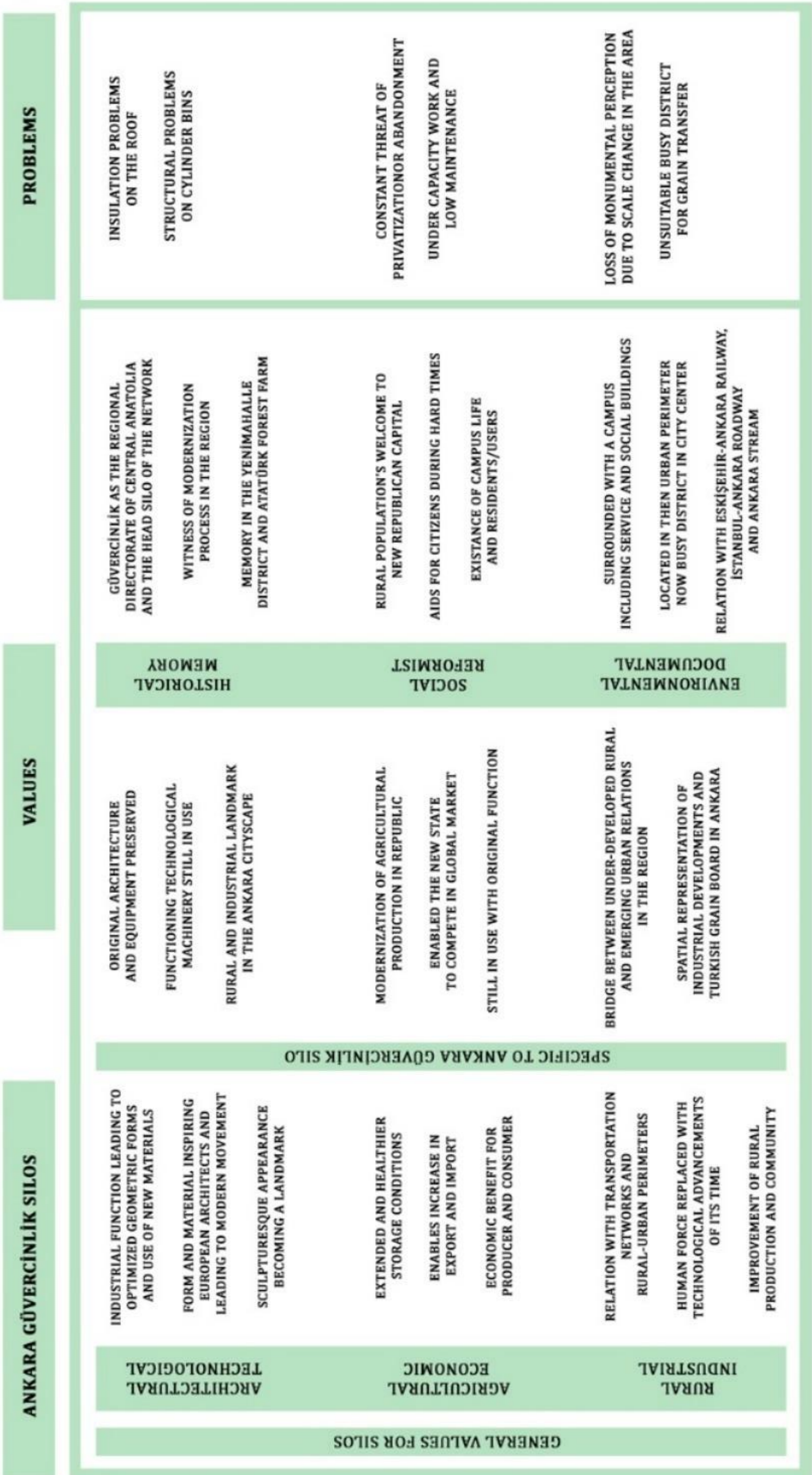


Figure 4.6. Values and problems of the silo (Author, 2021).

However, when it comes to the agricultural and economic values, there is a risk of loss due to the desire to disable the silo from working. If that happens as planned, the silo will not participate in the state's effort to compete in trade and, therefore, moves out of the modern rural production process. Secondly, the storage capabilities of the structure would be wasted. Additionally, the historical and social values are also in danger in this regard because the symbolic meanings attached to this landmark can soon be forgotten. Its historical importance on how the rural life and production was improved or how it took place in the collective memory of the communities can start vanishing as TGB strips these structures of their purpose.

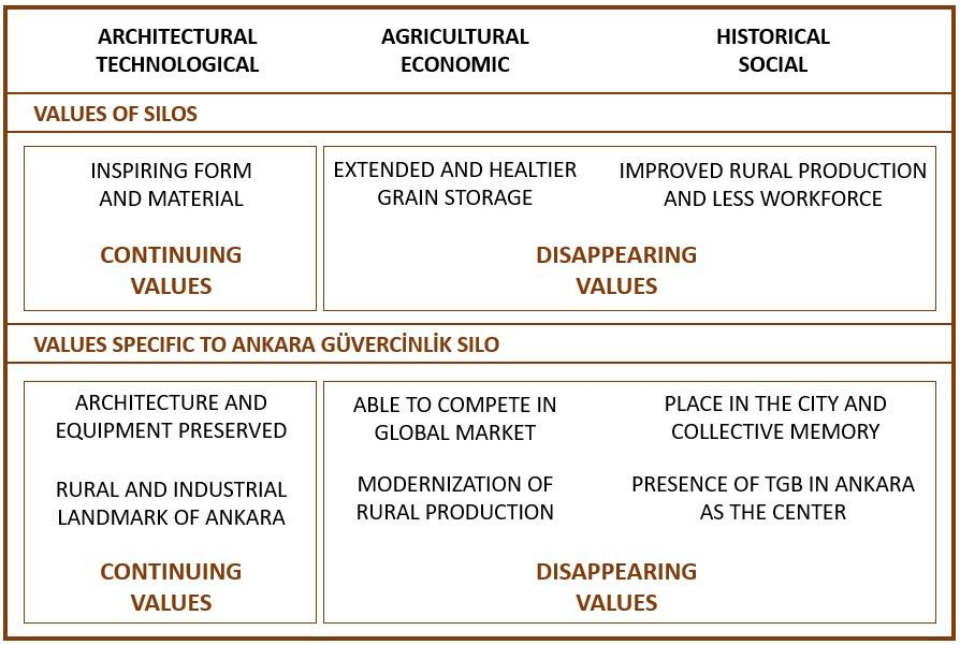


Figure 4.7. Continuing and disappearing values of the silo (Author, 2022).

In the end, considering these values and problems, the Turkish Grain Board Ankara Güvercinlik Silo can be evaluated as a cultural heritage in any case. The values of the silo at the network, campus, and building scale will determine its significance

because the statement of significance is based on the values and key concepts that make up the silo. Then, to face the problems and create potentials, the significance will be used to form the vision leading to decisions and principles.

4.2 Significance of the Turkish Grain Board (TGB) Ankara Güvercinlik Silo and Vision for Its Future

The conservation management process necessitates the significance of the heritage place through its values and proposes actions to sustain that significance (Clark, 2001, p. 6). As mentioned in the second chapter of the thesis, silos are interfaces between various aspects. They act as a bridge or a transition zone between rural and urban settlements and communities. They represent both agriculture and industry in terms of development by utilizing one for the other. Moreover, they serve production and consumption cycles as an entity that contributes to both but does not fully represent one over the other because silos are essentially just storage structures that are not directly responsible for the agricultural production itself but a tool for the betterment of the process and conditions. Thus, the Güvercinlik Silo becomes a spot of **interfaces**.

The silo symbolically reflects the social and economic aspects of its interface characteristics. This reflection is embodied through architecture because it played a part as a spatial tool for the modernization policies in the country's history. It has been mentioned that the value of the architecture of the silo comes from its form and material. Its monumental and unique geometric form and the use of new technological concrete material particular to its period have made it a **landmark** for these symbolic features.

Meanwhile, during modernization, the context which emphasizes the function and location describes the silo as one of the agricultural storage centers that make up the Turkish Grain Board network. These centers become a hot spot that links activities as an interface connects the grain to transportation means and becomes a meeting

space for producers and consumers. Thus, Ankara Güvercinlik Silo turns out to be a **node** for all these actions.

In this regard, the silo appears as the **node of landmark at the interfaces**. Based on this, the statement of the significance for the Ankara Güvercinlik Silo can be identified as the node of landmark due to its architecture with exceptional form and material and context regarding function and location at the interfaces of rural and urban, agriculture and industry, production and consumption.

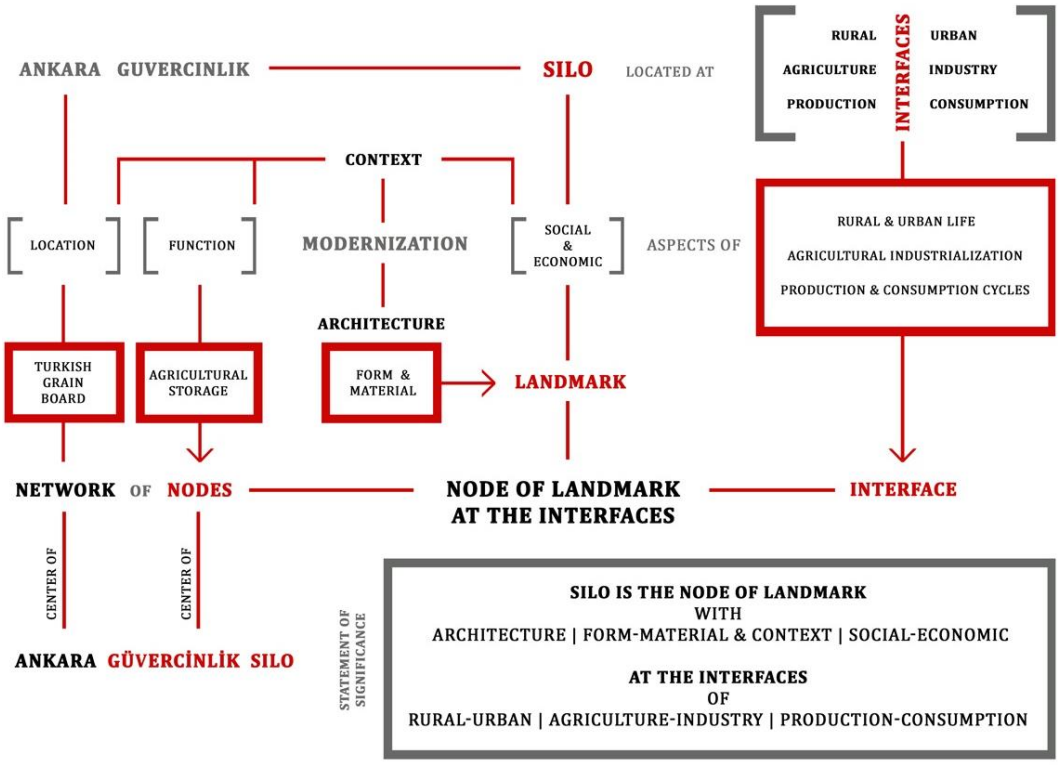


Figure 4.8. Significance of the Ankara Güvercinlik Silo (Author, 2021).

As a statement, this can be used for other silos as well. But, the authenticity of the Güvenrcinlik Silo differentiates itself from the others. In the Nara Document, a cultural asset's tangible and intangible attributes and values show diversity in its local context. Thus, the difference in the authenticity of cultural heritage depends on the

diverse cultural perspectives, which then provides a specific acknowledgment of the said heritage in the face of the statement of significance.

In relation to the significance, future actions should follow principles based on a defined vision. These actions will directly or indirectly affect the silo at all scales and will be instrumental in both its conservation and sustainable development. In addition to these, there should be decisions aiming to lead the development of not only the silo but also its physical, functional, social, and economic context.

When the problems are evaluated, the main ones are based on the broken ties of the silo with its context. Therefore, three main principles can be defined within the framework of the problems and potentials of the silo. **Re-connection** for the broken contextual and spatial ties, **re-conduction** for administrative irregularities and abandonment of function, and **regeneration for the silo** to be included in urban life to provide new contributions and values while sustaining and conserving the existing values.

Re-connection and re-conduction of general aspects regarding the structure, nearby surroundings, and national strategies will be the principles for the conservation plan. It is difficult and somewhat unrealistic to demand drastic changes through concrete decisions in scales other than the building itself. However, within the borders related to the silo, suggestions and ideal scenarios should be proposed.

For the regeneration of the silo, two major constraints are beneficial to acknowledge for the conservation management plan. These are **the conservation of silo's primary aspects based on its values** and **sustainable development goals in the design decisions**. Silos' primary aspects are based on its rural, industrial, and modern qualities, while UNESCO recommends the sustainable development goals for people and the environment to have a better future against the crisis of climate change. Although heritage sites' main intention may not be for the development of their community, cultural heritage sites should be expected to answer these needs because only then, their conservation plan can be successful in the long term. Contemporary design, including the regeneration of historical places, needs to

answer contemporary necessities of infrastructure, accessibility, safety, comfort, technology and be beneficial for the world against a global threat while at it.

However, under the constant changes in the field of agriculture, how possible it is to maintain silo's original function in today's conditions need to be realistically considered because it may also be better to continue with another function, at least in the future. Thus, the regeneration of the silo is expected to be planned in two scenarios. The first scenario is to preserve the silo as it is and keep it operating until it cannot. After the first scenario inevitably ends, the second scenario would be about a suitable adaptive reuse proposal based on the research conducted with the examples around the world, previously in the thesis.

Warehouse and agricultural storage structures, in general, are valuable since the food supply of large urban communities is a big concern for many states against the global threats. Silos are already existing ideal monumental structures, but it is a fact that they are a centralized approach and support rather old technologies. Meanwhile, licensed warehousing creates new job opportunities, localizes the storage issue, and is easy to operate due to its smaller size and up-to-date technological equipment. Inherently, it is a very advantageous option in its essence, and it cannot be judged negatively just because it renders silos unworkable.

When the time comes, and the silo would not be in use anymore for its job, it should not be wasted away as an inert mass. Elevators and silos are valuable structures with a lot of potential. But it's unrealistic to expect people's attention just to look at abandoned, dilapidated silos. There is no definite answer to where and how to find the continuous interest and participation required for sustainable development. Nevertheless, engaging in its story, making connections, and including urban life expands the potential for the silo and creates links necessary for its continuity (Frisch, 2006, p. 125-128).

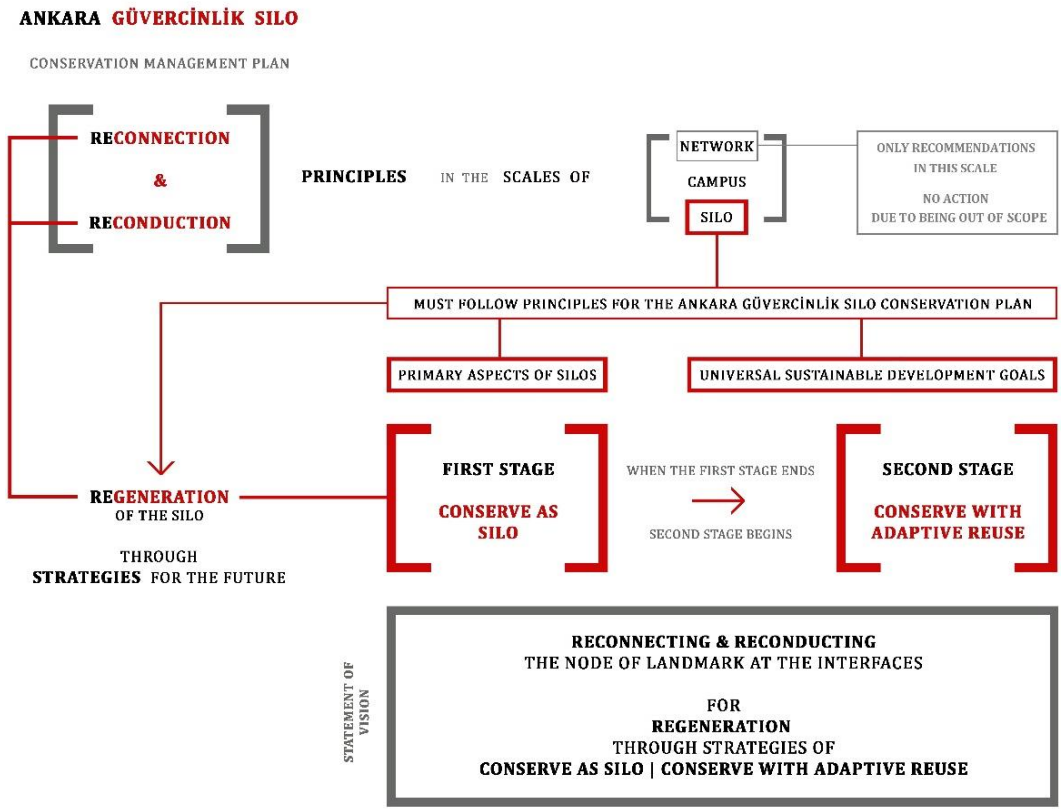


Figure 4.9. Vision for the conservation plan of the silo (Author, 2021).

While solving the problems that arise over time in the face of values, it is desirable to invest in the future of the environment and society while aiming for sustainable development.

Besides its values, environmental perspectives may justify the conservation of the built environment. It is a fact that the demolition of these monumental structures causes a waste of resources and energy. Also, it would cost less to preserve than rebuild, which can be a reason for its conservation (Déom et al., 2013, p. 63).

In the light of these remarks, the statement of vision for this cause would be to **reconnect** and **reconduct** the node of landmark at the interfaces for the **regeneration** of silo through strategies of **conservation as a silo** and after that with **adaptive reuse**.

4.3 Principles of Interventions for the Turkish Grain Board (TGB) Ankara Güvercinlik Silo

Within the framework of the determined vision, there is a need for transformations and changes that are compatible with the main idea and will not deviate the structure from its line of purpose. Therefore, it is necessary to determine various principles for the conservation plan.

The main aim of these principles is to reconnect and reconduct values, needs, and demands for the conservation process. It is crucial to see and utilize the potentials of the silo through the execution of suggestions and ideas derived from these principles. Although keeping the silo in its original function within the Turkish Grain Board is ideal, these principles should be relevant regardless of the function in the face of adaptive reuse.

The Turkish Grain Board TGB is considering leasing its silos for licensed warehousing activities (TMO, 2019). Even if TGB uses the silo as its own facility or leases it to be a licensed warehouse, there is no long-term conservation strategy for the building. Every new general manager and their team prepare their short-term plan[20]. Therefore, it is necessary to develop principles for the Güvercinlik Silo to ensure sustainable development and value-based conservation.

Principles regarding the Ankara Güvercinlik Silo should be generated in three scales for a comprehensive approach on the issue. These scales are in relation to network, campus, and building, respectively.

[20] This is based on the letter of projects invitation for the Güvercinlik Silo which has been called off by the new general director. The letter is in the appendices.

4.3.1 Principles for the TGB Ankara Güvercinlik Silo in Relation to the Network

Principles in relation to network scale mainly focus on the social and economic aspects of the institutional identity of the silo, the Turkish Grain Board. Organizational, architectural, and socio-cultural decisions within the principles are necessary for the re-connection and re-conduction of the conservation plan's vision.

Re-connection is essential to strengthening the network and the silos' ties with the institution and people, whether the people engaging with this heritage are producers or consumers, personnel or public, researchers or investors, etc. When these ties are broken or interrupted, the network or the silos can lose their connection and be detached from their context, environment, and purpose. Therefore, the conservation management plan needs to prioritize re-connection strategies. Meanwhile, re-conduction aims to ensure proper management, establish administrative requirements, and prepare research for conservation strategies of the silo structures.

Administrational Principles: Connect with Producers and Consumers, Conduct Future Management Plan

In terms of organizational matters, **connecting with producers and consumers** is essential because TGB should stay as a public economic enterprise that works to benefit producer farmers, rural communities and consumer groups, urban communities against the growing demand, and extensive implementation of capitalist approaches in the economy. Therefore, encouragement of rural production and human-oriented policies against the growing demand of capitalism is important. In addition to that, it is vital to acknowledge the silos and network as an essential cultural heritage in the historical development of the country's social modernization and economic growth. That is why **conducting a future management plan** which aims for the registration of TGB silos, lands, and parcels is the topmost priority. Following these registrations, sustainable development goals and design decisions

need to back up these decisions and provide a future for the network in a comprehensive approach.

Socio-Cultural Principles: Connect with Neighborhoods, Conduct Engagement

When it comes to socio-cultural principles, **connecting with neighborhoods** is key to achieving longevity. This takes an effort on the board's side to provide interaction with the network. Scientific, agricultural, educational events, art exhibitions, sports teams, radio, and other media shows, and much more different current and previous social aspects of the network and silos should be extended and shared with the public or brought back and sustained if abandoned. **Conducting engagement** with people and providing access to some extent for campuses and silos in order for the public to interact with this heritage comes in line with this foundation.

Architectural (In this Scale Mainly Spatial) Principles: Connect Silos Nationwide, Conduct Funds and Research

Architecturally, it would not be sufficient to talk about structures on this scale, but when we look at it spatially, the **connection of silos nationwide** emerges as the main obstacle as ties between them are needed. Change is inevitable for silos and may even be supported. However, the regulations regarding all silos of the network should be consistent and susceptible nationwide. Because then their qualities as cultural heritage can be recognized, and the network as a whole can be remembered through its architecture. This also leads to another critical issue which is to **conduct funds and research** for the network and silos. A certain amount of income from the board and related establishments should be used for the maintenance and repair of the silo and campus structures. Tenders currently do these, and it could work as well. However, the current method of call for tenders should not only be given to the most economically viable company but also to individuals who are experts in the field of conservation and are aware of the values of the building. Not only that but also academic studies and various types of research should be encouraged and supported with financial means and resources.

When discussing the principles of an industrial structure on such a large scale, it is inevitable to have a more general approach to its conservation. These principles do not specify conditions relevant only for the Güvercinlik Silo. Therefore, all of these decisions are applicable for the other silos as well. The Turkish Grain Board and the network of silos share their social and economic impacts, goals, and spatial qualities to some extend. When these principles are laid out, it can be seen that they rely on the values of the network in a more general sense. Thus, every Turkish silo can benefit from these decisions. Moreover, these can be applied to the silos abroad as well because these principles are based on the sustainable conservation of a rural and industrial heritage that has been implemented worldwide as a modern object. Therefore these principles can be reinterpreted for other silos with different historical and social contexts as long as they had the same agricultural storage of rural productions purpose.

NETWORK SCALE

RECOMMENDED PRINCIPLES FOR CONSERVATION WITHIN THE SCOPE OF ANKARA GÜVERCİNLİK SILO

	ORGANIZATIONAL DECISIONS	ARCHITECTURAL DECISIONS	SOCIO-CULTURAL DECISIONS
RECONNECT	TGB SHOULD STAY AS A PUBLIC ECONOMIC ENTERPRISE THAT WORKS FOR BENEFIT OF PRODUCER FARMER AND CONSUMER COMMUNITY	CHANGE IS INEVITABLE BUT THE REGULATIONS REGARDING ALL SILOS SHOULD BE CONSISTENT AND SUSCEPTIBLE NATIONWIDE	SPORTS TEAMS, ART EXHIBITIONS, SCIENCE AND EDUCATIONAL EVENTS, RADIO SHOWS AND OTHER CULTURAL ASPECTS SHOULD BE BROUGHT BACK
	CONNECT WITH PRODUCER AND CONSUMER	CONNECT SILOS NATIONWIDE	CONNECT WITH NEIGHBORHOODS
RECONDUCT	REGISTRATION OF SILOS AND TGB LANDS/PARCELS IS ESSENTIAL TGB SHOULD PREPARE FUTURE MANAGEMENT AND ACTION PLANS FOR CAMPUSES AND SILOS REGARDING SPATIAL ASPECTS	ENCOURAGEMENT AND SUPPORT FOR ACADEMIC STUDIES AND DOCUMENTATION OF TGB, SILOS AND NETWORK A PORTION OF THE INCOME SHOULD BE USED FOR THE MAINTENANCE AND REPAIR OF SILO AND CAMPUS STRUCTURES	ACCESSIBILITY TO SOME EXTEND WITH CAMPUSES AND SILOS FOR PUBLIC TO INTERACT WITH THIS HERITAGE PARTICIPATION OF COMMUNITIES AND STAKEHOLDERS FOR THE FUTURE DECISIONS ON THE NETWORK INSTEAD OF TOPDOWN DECISIONS
	CONDUCT FUTURE MANAGEMENT PLAN	CONDUCT FUNDS AND RESEARCH	CONDUCT ENGAGEMENT

Figure 4.10. Principles based on the vision for the silo in relation to the network scale (Author, 2021).

Figure 4.11. Relevancy of principles for other silos in relation to the network scale (Author, 2022).

4.3.2 Principles for the TGB Ankara Güvercinlik Campus

Campus scale principles aim to strengthen the relations between the city and neighborhood with the campus and silo. In order to establish this, decisions need to focus on strategies that will help the campus sustain and develop itself internally and externally while establishing ties with the nearby surrounding and citizens.

Administrational Principles: Connect with Atatürk Forest Farm, Conduct Regional Planning

Within the organizational matters, **connection with Atatürk Forest Farm** is necessary to maintain the spirit of the place, keep Atatürk's will, and support agricultural production and rural communities. Agricultural studies and developments prepared on the campus should utilize and benefit what is left of the

field or other rural lands and settlements in the city. This way, the campus can re-connect with the Atatürk Forest Farmlands, this connection may be limited in physical aspects, but it can be strengthened in a contextual manner. Even though most of the AFF sites have disappeared, the existence of this campus serves its initial purpose and undertakes to take over the cause. However, what needs to be done is not limited to this. **Conduction of regional planning** that specializes in the involvement of the TGB campus in the development of the district is another step in this direction. Relations with the stream, railways and the neighborhood need to be strengthened and be more interactive physically and contextually. Settlement and traffic type and density should be reconsidered in upper-scale regional planning to better accommodate large vehicles for grain transfer and enable pedestrian movement around the site.

Of course, these decisions may not be attainable only because of the TGB campus in the region since many kinds of commercial establishments crowd the area instead of farmlands. But it is still important to acknowledge that as the first settlement of the site, the silo and the campus are more-or-less generators that formed a voluntary or involuntary guideline in the late 20th century. Departing from this knowledge, regional planning strategies based on the improvement of the campus may not be just a delusional idea for the future. The Turkish Grain Board is not the only authority for a judgment to this extent but is a step in the right direction to address these possibilities for upcoming opportunities.

Architectural Principles: Connect with New Technologies, Conduct Refunctioning

Architecturally, the campus buildings of facilities and services need to **connect with new technologies** that integrate the latest developments in agriculture and other purposes to ensure the campus keeps up with today's conditions in agricultural production and contemporary life. In this regard, the TGB is actually actively working for constant improvements. But these should not only be limited to the new technologies in the laboratory facilities. The campus as a whole system should utilize

new technologies to develop not only its agricultural responsibilities but also social life, transportation, administrational means, and such. The implementation of these technologies may cause insufficient building stock or lands to be rendered useless. What to do in such a situation is related to the **conduction of re-functioning** principles for the structures. Currently, some buildings are in the process of re-functioning, but the changes and the degree of interventions should not be excessive in order to preserve their values and significance. Consolidation and basic repair should be prioritized over total exterior change, which would be more cost-efficient and conscious of the structures' significance. The built environment of the campus should be preserved instead of more constructions and demolishments because of its historical and architectural values and potentials.

Socio-Cultural Principles: Connect with a Sense of Belonging, Conduct Sustainable Customs

In terms of socio-culture, **connection** to the campus **with a sense of belonging** will ensure long-term continuity and enable realistic approaches to be attainable. The residents, workers, farmers, and the neighborhood should feel this sense of belonging through active participation in events and decisions. Thus, the necessity of its conservation and the determined principles do not remain only on paper but could be realized from theory to practice due to the ownership of various communities. For the generation of these conditions, there must be **conduction of sustainable customs** and interactive events for the residents and people outside the campus. Proper socio-cultural actives should center around the local context and the demands of city life. Customs and traditions of the TGB Ankara campus like iftar, festival, and expo are repealed from time to time by changes in the management team and general director. These should be brought back if dismissed and appropriately sustained, regardless of the spontaneous top-down decisions. This would ensure permanence and help reshape and maintain the identity and spirit of the place.

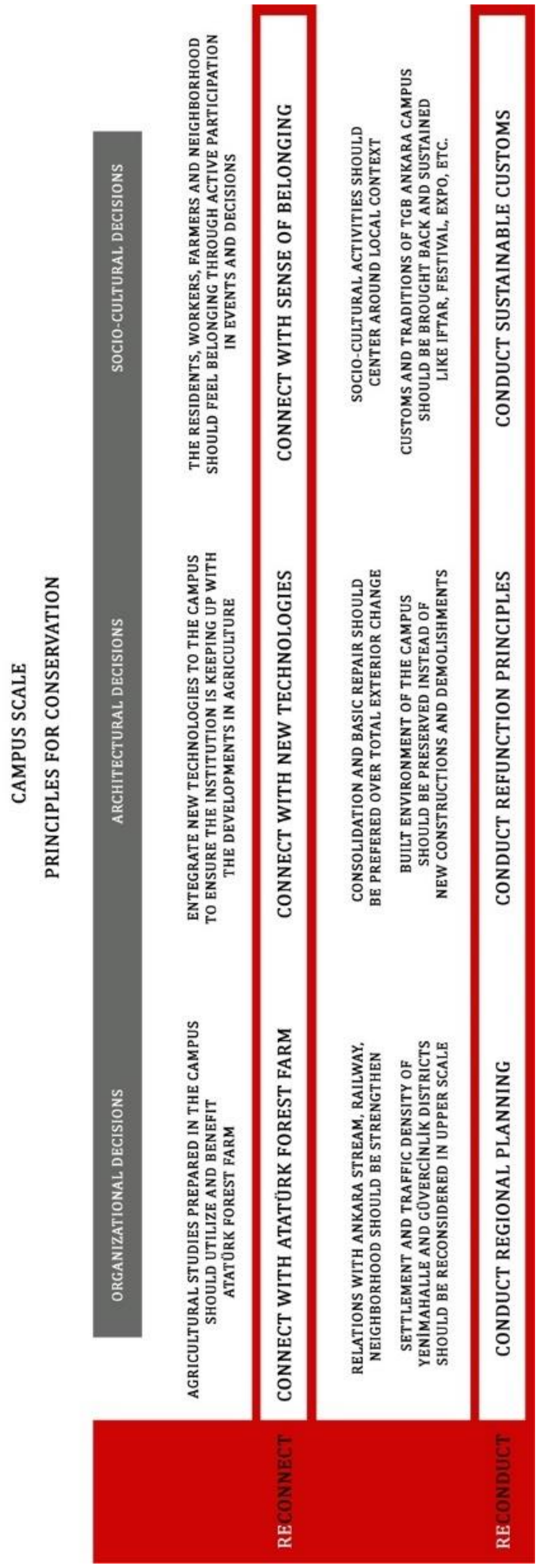


Figure 4.12. Principles based on the vision for the silo in the campus scale (Author, 2021).

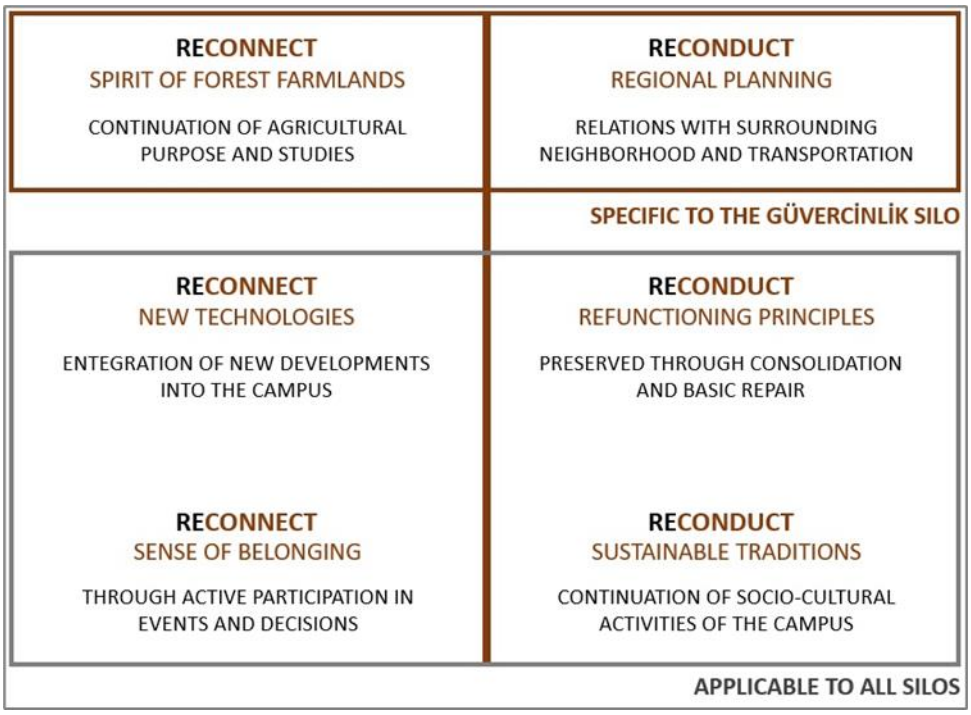


Figure 4.13. Relevancy of principles for other silos in the campus scale (Author, 2022).

Some of these principles in the campus scale can be relevant for the other silos and campuses of the TGB's network. As expected, organizational decisions to connect with the AFF and conduct a regional planning strategy accordingly are principles tailored explicitly to the Güvercinlik Silo and its surroundings. However, the other principles can be reinterpreted to suit different silos and campuses due to the similar socio-cultural impact and architectural qualities of these settlements all around the network. These depend on the existence of a lively campus that had not been abandoned or disintegrated. Therefore, the situation demands an evaluation to see if these can be relevant for other campuses. It becomes even harder to evaluate the implementation of these decisions if the topic of discussion is from different nations and socio-cultural perceptions. These silos may not even have campuses since their existence is due to the Board's organizational structure and later decisions. Thus, in

theory, they can be applied to other silos and campuses, but the practice requires an evaluation and assessment of the existing conditions.

4.3.3 Principles for the TGB Ankara Güvercinlik Silo

Silo or the building scale principles highlight the importance of materialistic aspects and needs, interdisciplinary research, and public awareness during the process. The parts concerning concrete steps in the structure's future management plan will be extensively planned out in the next phase of the actions. At this stage, the aim is to create a general framework and determine guidelines for further decisions.

Administrational Principles: Connect to Transportation, Conduct Adaptive Reuse

In organizational aspects, **connecting silo to transportation** lines in order to provide access from railways and regulate large vehicle traffic directly and effortlessly to the silo is expected. In a more general way of stating the issue, it may be necessary to review the means of access to the silo. Railway systems can and should be operated for the benefit of agricultural production again, or maybe for more than grain-related works. It is the most efficient means of transportation due to the lack of large-sized loading limits of vehicles and traffic. If the roadways are this indispensable for access, the least that could be provided would be to regulate new directions of entry or time slots for the agricultural vehicles to enter.

These measures are mainly crucial for the silo to function with its original use. Although it is right to make these assumptions for the current conditions, functional change in the future is also possible or rather expected. The structure should be conserved even if it loses its original function. Thus, there is also the inevitable possibility of **conducting adaptive reuse** proposals beforehand. The silo should work in its original use as long as possible while utilizing its total capacity. But when silo can no longer function for agricultural storage and becomes utterly inefficient

for the required conditions, reuse proposals should be prepared gradually according to its values, significance, and vision.

Socio-Cultural Principles: Connect with Past-Present-Future, Conduct Public Awareness

Socio-cultural means of conserving the silo are related to accumulating knowledge and experiences. **Connection with the past, present, and future** is the key goal in this principle. The silo would provide continuity of the rural and industrial characteristics of the site as a heritage place. If permanent ties are established with what has happened over time, its worth and acknowledgment can be understood and passed on to the future. There is no single defined solution for achieving this, but there are many opportunities since the silo and its identity are still present. A way of achieving this, regardless of the working conditions of the silo, would be to conserve the structure's architectural features and authentic equipment and display them inside the silo in their designated places. Another approach would be to exhibit the work that is being done internally to an audience.

Moreover, there is one obvious need which is to conduct **public awareness**. Raising public awareness on the socio-cultural importance of the silo should be accomplished through local events and the use of mainstream and social media, as it would fit for the age of information and communication technologies. In this context, the sculpturesque aspects of the silo should be preserved to keep the landmark quality constant as it appears to be the spatial manifestation of this continuity and the object of the public eye.

Architectural Principles: Connect with Experts, Conduct Maintenance

In terms of architecture, material and structural issues are the main concerns as the silo is preserved in terms of form and architectural elements. It is crucial to start necessary interventions by **connecting with professionals**. Reinforce concrete structures have a lifespan; thus, they require interventions to operate as time goes on. There should be steps to identify problems, develop criteria, and assess the impact

of interventions on reinforced concrete. Additionally, there is a need to **conduct maintenance** periodically. Interventions that are harmful or insufficient should be removed, like the deteriorated water insulation. Repair and consolidation work followed by periodic monitoring and noninvasive equipment, if necessary, need to be provided.

In this regard, some of these principles can be reinterpreted to be applied to other silos. Reconnection with transportation lines, especially the railways, is important to preserve the links between settlements and the silos. Thus, these structures can all benefit from this decision. Conduction of maintenance is crucial for every cultural heritage. Therefore, it is expected that the silos need to be repaired, consolidated, monitored and if necessary, stripped of harmful interventions. Reconnection with past-present-future is also relevant for all silos that share values and memories with their communities, neighborhoods, and nations. Lastly, conducting public awareness for this rural and industrial heritage can be beneficial to create attachments. For the regeneration of other silos, expert opinions for future decisions can change on a case-to-case basis due to the silos' history and context. Therefore, if the situation demands when conducting adaptive reuse, a different approach could be needed depending on stakeholders' needs, architectural qualities, and urban development. This means that the Güvercinlik Silo can at least be used as an example.

The conservation process for reinforced concrete structures starts with understanding the place and assessing its significance, respectively. In the materialistic aspects, identifying issues and factors plays a critical role. Existing physical conditions, risks, and requirements must be taken care of within the stakeholders' best interest. Development and implementation of policies come into the scene with maintenance, repair, installation of infrastructure, and treatment as they should play their roles within the actions. Implementation with appropriate timing, priorities, and determination of resources are aimed at while being documented, monitored, and reviewed (Macdonald et al., 2020, p. 9). This is why the material and structural problems need the consultation of engineers and building science professionals.

Figure 4.14. Principles based on the vision in silo scale (Author, 2021).

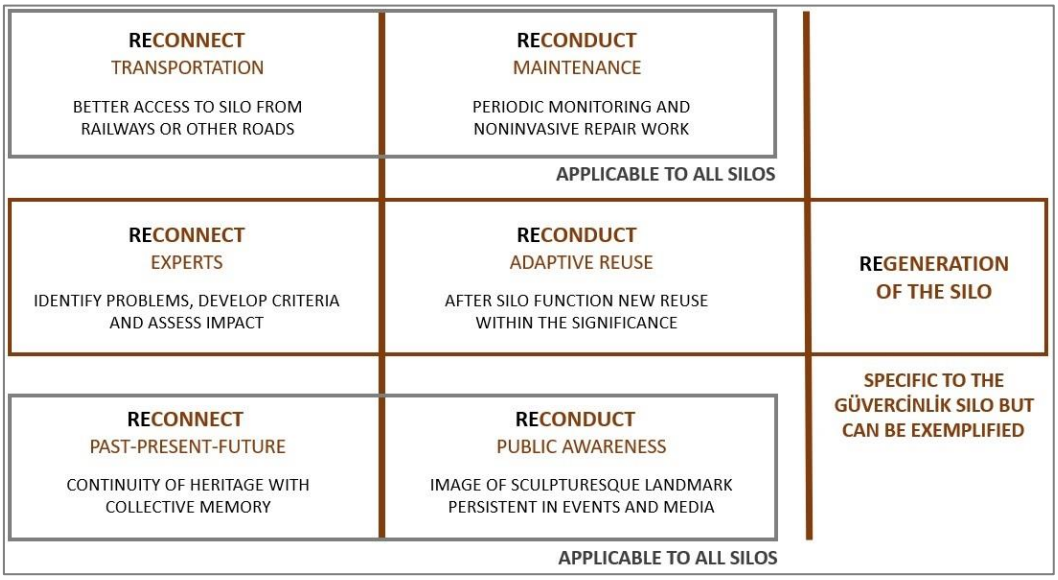


Figure 4.15. Relevancy of principles for other silos in silo scale (Author, 2022).

4.4 Actions for the Turkish Grain Board (TGB) Ankara Güvercinlik Silo

The actions aim to provide a method for the implementation of principles in the Ankara Güvercinlik Silo. These principles to be followed for the conservation of the silo as a rural and industrial heritage site were determined previously. Afterward, the preservation steps to be taken within the framework of these principles should be decided with certain priorities through gradual scenarios.

When the significant extent of its existence is revealed, two foundational approaches are encountered in preparing the actions. First, there are the primary aspects of being a silo derived from its values and defined within the significance statement, centered around its rural, industrial and modern character. Then, there are environmental considerations for design decisions in current conditions of world affairs. These global cautions declared by UNESCO aim to accommodate sustainable development

goals[21] for a better future "for people by people" (2015). The extend of the sustainable development goals (SDGs) is far beyond what would be covered in the scope of the thesis. However, a portion of these that would concern the silo both physically and contextually would be helpful guides. Even if these goals are not mandatory by-laws, considering the current conditions, both new structures and interventions applied to cultural heritage should be generated to be environmentally conscious and produce solutions against the problems of the climate crisis.

Within the consideration of silos, these structures were always charged to **store food to prevent communities from famines**. These famines occurred in hard times due to conflicts between humans and natural disasters. Thus, **in the face of the risks and inequalities posed by the global climate crisis regarding food access**, it would be a strategically meaningful choice for silos to continue to function for the benefit of society by storing and distributing agricultural goods. Later, when the silo cannot keep its function anymore, it should still be required to continue to work against some effects of the climate crisis, like threats on agricultural production and inequality in food access. Due to the structure's significance for this cause, developing methodologies for securing food products and their supply or a similar agricultural purpose would be fitting for its reuse since climate change has been damaging the world's agrarian lands and lives immensely.

[21] These are determined by UNESCO in September 2015, 70th session of the UN General Assembly. Retrieved from: https://en.unesco.org/sustainabledevelopmentgoals

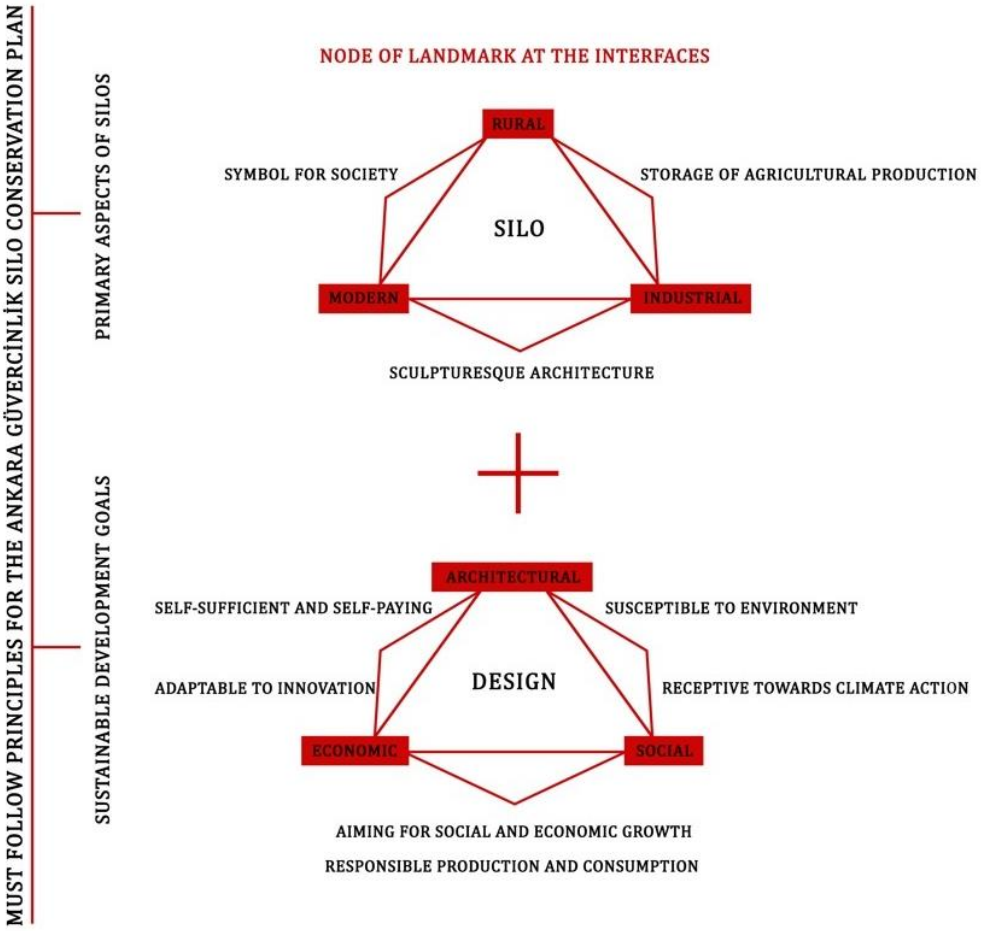


Figure 4.16. Two most essential criteria for the conservation of silo and its usage (Author, 2021).

Once these two concrete principles for actions are established, the functioning of the structure can be managed in two scenarios, respectively.

4.4.1 First Scenario: Conserve as Silo

The first scenario is to continue to function the Ankara Güvercinlik Silo while solving its current problems. Due to Turkey's agricultural policies, silos are getting out of commission. Otherwise, their abandonment is not because they are unnecessary or unable to operate anymore.

The importance of the private sector in the country's economic growth is distinguishable. The idea of licensed warehousing is not inherently harmful as well. In fact, it could be suitable for the localization of the process. However, the understanding of people over income is the responsibility of the governments, and the existence of large-scale public storage facilities, especially in the heart of a very dense and large capital city, is immensely valuable and proactive.

Rural production and agricultural products need to be protected due to the loss of farmlands. Environmental and climate crises are increasing the need for more silos and other storage structures to have preventative measures against global and, more than ever apparent, the national threat of hunger and loss of agricultural products. The building has already preserved its originality and integrity very well. It doesn't have any major problems except that the growing city encircles it while it has reduced its capacity and needs fundamental consolidation. Privatization policies and new storage systems have just discredited it, but it's not irreversible. It will have to be stated more strongly against the Neo-liberal system that preserving the silo's function is a priority in current circumstances.

Additionally, many countries may have to change their agricultural policies soon. Empowerment of rural production, ethical consumption, sharing resources equally, and taking precautions for the preservation of grain are expected outcomes of these policies. The role of silos in these methods would be inevitable due to their agricultural values. However, silos should also be open to innovations and changes accordingly to better adapt themselves.

Meanwhile, the Ankara Güvercinlik Silo should preserve its sculpturesque landmark qualities in addition to its function. This is crucial because, as a symbol of social and economic developments, its appearance will always be the part that makes the building stand out and define its means, authenticity, and uniqueness. Thus, whatever the functions turn out to be, this sculpturesque and symbolic quality should always accommodate the agriculture and storage aspects.

During the first scenario of the regeneration to adapt to today’s conditions to conserve as a silo, the aspects of storage approach and agricultural purpose emerge as the reasonings in the face of the mentioned environmental risks.

Ankara Güvercinlik Silo differs from others as a result of other values it has. These values exist because of the local and national context. It cannot be detached from agriculture, as it symbolizes rural modernization and aligns with the spirit of place as it sits upon the AFF land. At the same time, it is an already operating structure with large enough spaces and working equipment. Therefore, the continuity of the silo and its values and the improvement of its conditions, as previously required in the several scales of the principles, should be essential.

For maintenance, the Silo Systems Rehabilitation project for reinforced concrete and steel silos should place emphasis on preserving the building's values and authenticity. Rather than attempting inexpensive and straightforward solutions, one should act with the awareness that the building is a cultural heritage. All transactions and decisions should be supervised by authorized experts and evaluated regarding their effects on the values and significance.

The outer look and perception of the building is an utmost priority for the conservation of the silo. The main obstacles in this situation are the problems of the silo mentioned previously. The new water insulation with high-quality materials and regular monitoring is mandatory. The roofs need complete consolidation and repair in this regard.

The metal skin that strengthens the silo bins can stay since it is a non-invasive approach to the problem. However, the green horizontal stripes in the façade painting are damaging for the values and, therefore, they should be replaced with single-colored paints of white or gray. Lastly, the new roof with inclined surfaces on the vehicle loading part should be removed, or the form can be reshaped to have a flat roof for a coherent appearance of the façade, for the same reasons as before.

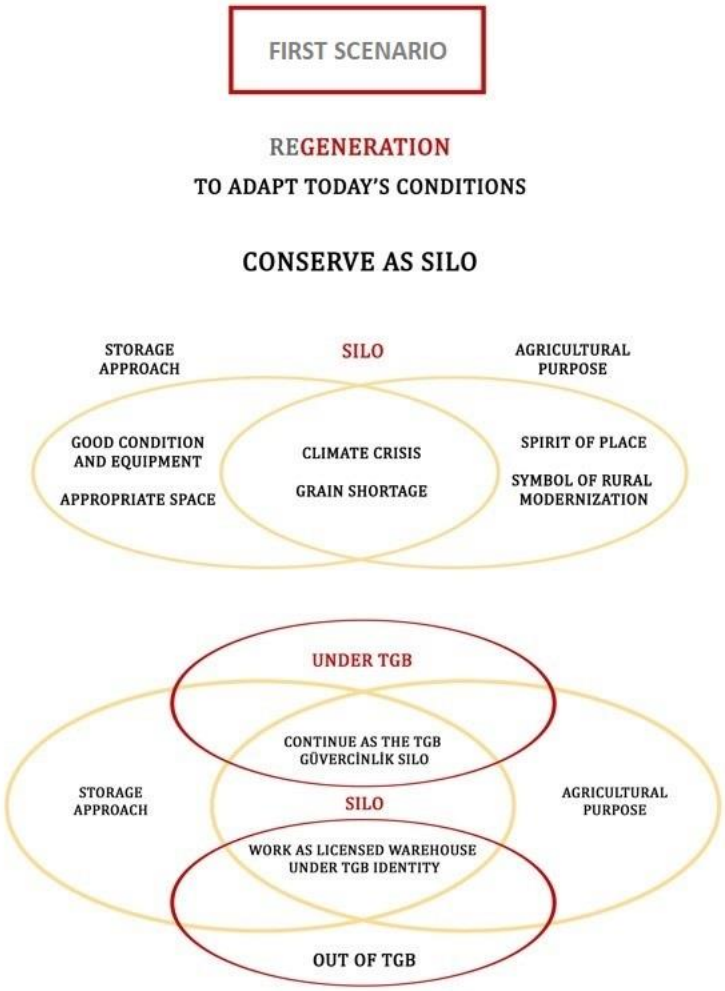


Figure 4.17. The first scenario of conservation as silo (Author, 2021).

In this case, the decision to be made is the regulation of the management. It could either continue to work under TGB or be privatized or rented, partially or as a whole, for licensed warehousing. Since the function would be the same, these options may not seem much different from each other. However, if it is not going to be working under TGB, conservation of its identity is crucial. Thus, all silos in the country, including the case study of the thesis, should be under the surveillance of TGB. Mainly the architectural qualities need to be preserved, including the institutions'

iconic logo and colors on the structures. If the integrity of values and features remain sustainable, then these approaches can both favor the initial intent.

4.4.2 Second Scenario: Conserve with Adaptive Reuse

The first option to keep the silo as it is should be preferred as long as it can adapt to today's conditions. However, if it cannot, the second option to develop adaptive reuse for the silo begins within the management plan.

Figure 4.18. The transition from the first scenario to the second alternative (Author, 2021).

The reason for doing this is always to try to keep the silo in production, development, and life. If it loses its function, it must be regenerated for a new use. When looking at the operation of grain warehouses throughout history, there is the same approach. Many of them were re-functioned due to inadequacy or changes in methods and thus, turned into other public uses like halls or barracks[22].

Refunctioning of structures has always been relevant for centuries. Buildings that are no longer being used could be transformed for new functions. Grain storage structures are no different. In fact, due to their large and simple geometrically formed flexible spaces, they have been reused throughout history. When looking at the silos,

[22] This was previously explained in the assesment of values (Erkal, 2020, p. 17).

it was mentioned earlier in the thesis that they are reused within three different intervention methods for various purposes in different settlements and contexts.

Adaptive reuse aims to achieve longevity in the lifespan of the structure and uplift the community and environment. In this scenario, there can be various design and re-functioning proposals.

During adaptive reuse, identities should not be stripped from the structures. When it comes to the Turkish silo, it cannot be thought of outside of the Turkish Grain Board, its social symbolism, and memories of its community. Therefore, the reuse proposal must comply with silo-specific values as well. Rural and industrial aspects should not depart from the framework of modern development. Thus, it would still relate to agriculture, production, and modernization. When it comes to the choice phase, it should abide by these main principles.

Determining the intervention degree is a case-to-case study. When making that decision, one crucial thing to mind is ‘genius loci,’ the spirit of place. Preservation and the revival of genius loci in the context of adaptive reuse should be a priority, as it is directly related to the authenticity of the silo (Plevoets et al., 2019, p.90-91). In this regard, compatibility with the spirit of place, which is related to the local context, community, and neighborhood memory, is essential. To attain these, the right preferences for intervention is the key factor. The silo structure stands out with its sculpturesque presence as a landmark beyond its internal storage features due to the lack of human interaction and memory. Because of these, during the critique of possible interventions, the preserved-bins approach emerges as the ideal solution for the exterior appearance of the silo.

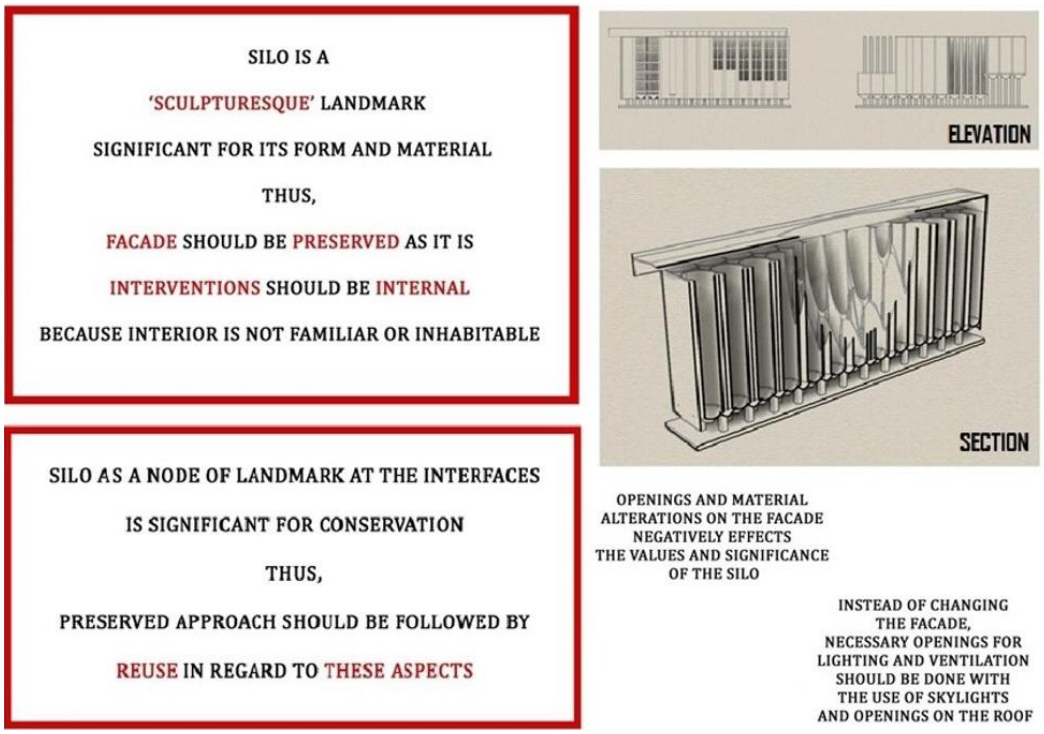


Figure 4.19. The limitations in interventions (Author, 2021).

Highlighting the facade and sculptural features can be likened to objectifying the building. If another building group were being discussed, it would render the content of this work incomplete. However, since silo structures have always been examined in this regard and have differentiated from other building types thanks to this quality, the decisions to be taken will be based on a framework that fits the spirit of the building. This means that the alterations should be internal during the adaptive reuse proposal. The existing interior of a silo is unfamiliar and inhabitable, so the interventions to change it are welcomed.

However, there would also be a need for openings for ventilation and light. Instead of opening these on the bins' surface, like in the altered approaches seen in the silo intervention types, the openings should be made from the roof by carving out the interior mass and elements. This would not only preserve its façade but also enables the creation of habitable spaces. Additionally, it does not impose a structural load on

the structure and on the contrary, alleviates the existing loads. These carvings' shape, size, and location are up to the possible proposals, but the possibilities should be inspiring and compelling for architects and designers.

The silo as the node of landmark at the interfaces is the significance of the place. Therefore, potential adaptive reuse scenarios should conserve and extend this meaning by creating interfaces between different occupations and then banding them together as a node that would be recognized as the landmark for these interfaces. Compatible design strategies and participatory decision-making can determine these different occupations that would re-function the silo.

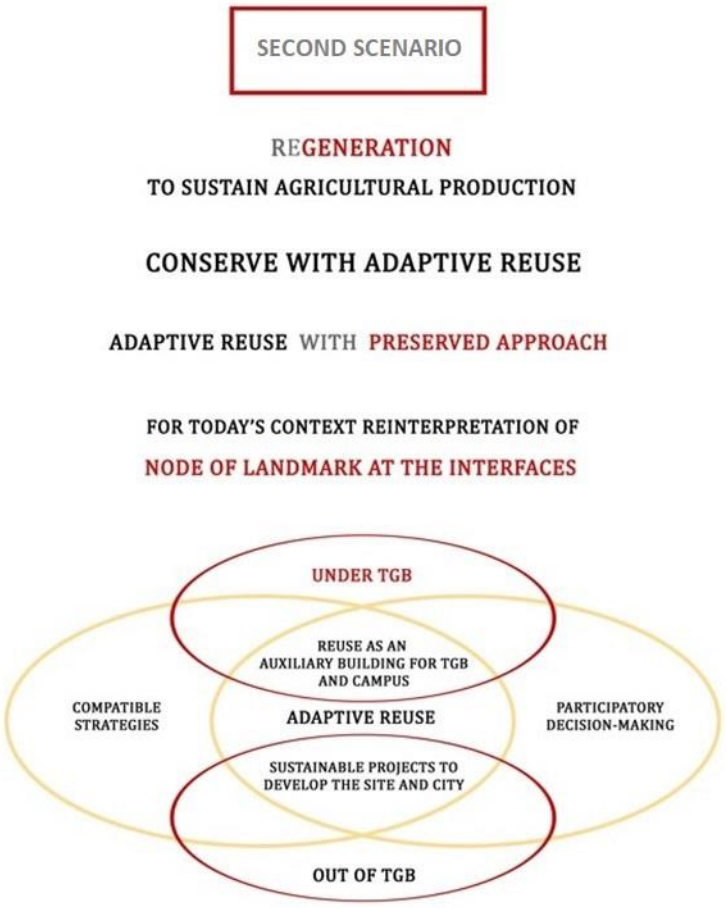


Figure 4.20. The second scenario of conservation with adaptive reuse (Author, 2021).

Instead of one-dimensional purpose directed with top-down decisions, an approach that focuses on the community's needs and demands while addressing the problems of the structure with compatible solutions can provide sustainable development and its goals for the environment and people. Meanwhile, these desired multi-dimensional purposes that create interfaces should be including agriculture, rural communities and production, industrial-technological advancements, and modernization in socio-cultural means.

The conservation problems of the concrete material of silo structures are mainly based on the potential damage of the inspection methods and the unavailability of the proper repair methods. Additionally, problems that may occur with adaptive reuse are related to the difficulty of applying new design solutions to the structural system and finding a function compatible with the existing structural configuration. Proposals should not harm the structure and form. Moreover, they should also be sustainable, consistent with the context, and provide agreement among the stakeholders (Landi, 2017). This is why active participatory decision-making is crucial to planning a reuse proposal. The participation of experts, building scientists, and stakeholders, including administration personnel, workers, residents in and around the campus, rural communities, producers, and consumers, should be considered for an inclusive process that bases on an adopted solid foundation.

Under the ownership of the Turkish Grain Board, the reuse proposal could be used for extending the institution's services. The board is already known to be a publicly beneficial entity that is constantly improving itself. Thus, it would be in line with the TGB to continue to utilize the silo in that respect; however, if the silo's ownership goes out of the TGB, it should still have remainders of its identity. In terms of the exterior, it should look like the other TGB-owned silos for the consistent image of the network. Visually, the Turkish silos should be subjected to this responsibility as the nodes of landmarks. Other than this, the new function must be a sustainable project to develop the site and the city together with its people. Thus, requiring a

participatory process and compatible strategies that align with the values and significance.

Some professionals suggest that the type of silo can affect the new reuse proposals. For example, in Italy, residential and office usages are preferred for silos with floors and openings, storage usage is compatible with the cellular vertical bins with no openings, and the exhibitory uses are suitable for both types (Giuliani et al., 2018, p.4). On the contrary, other professionals say that a precise definition cannot be made according to the silo typology for its integration into life and reuse. However, silos that provide open-plan spaces are more advantageous as they provide freedom of space creation. It is also easier to add openings to these spaces (Fernández-Fernández et al. 2017, p. 309). It was mentioned previously in the intervention process that the spaces and openings that will be required according to the new function of the silo can be made without spoiling the exterior features and facade perception. However, it is evident that the different spatial characteristics of a silo would also provide differences during reuse. In Turkey, there are three types of reinforced concrete silo typologies. Type 3, which includes Güvercinlik was the only one with a central core and two wings of bins on both sides. Compared to the other two types, this aspect can better allow two different functions or scenarios to meet and overlap in the central core. Thus, it reinforces the interfaces at the node concept of the silo itself.

Economic conditions also play a significant role in determining the new function. Silos take up less space on the ground and consist of repeating tall bins, and their re-functioning is difficult due to the high costs involved in this configuration where the load is high but the bearing ground is low.

It is desirable for the heritage place to pay for itself and be self-sufficient. However, David Worth argues that even though it would never be able to do that, silos can still help their surroundings for development and elevate their conditions by adding new values. The Zeitz Museum of Contemporary Art, which is the reuse adaption of the Cape Town Silo, was initially thought to be able to pay for itself due to its social and economic significance. However, the Victoria and Alfred Waterfront rejected the

proposals for interactions with the public and various kinds of art installations and performances. Thus, the team agreed on the fact that the economic benefits of the reused silo would be acknowledged indirectly (2014, p. 4).

This means that the reuse process of the silo will be an economic burden. However, it will be able to pay this debt with its contributions to its environment and work field and will provide financial income in the long term. Additionally to the economic benefits, there are also the social and cultural aspects to consider. There can be approaches in which the silos could be transformed into public spaces such as cultural centers to improve rural and urban life. Thus, the economic and social impacts would go hand in hand.

When discussing the conservation of silos, Michael Frisch argues that human interaction is the most crucial aspect. The relationship of silos with the workers and neighborhoods is usually close despite the big differences in their scale. Thus, he believes in a story-driven approach and suggests that the organization of oral history tours, exploration of the rural and urban built environment, and virtual forms of interaction by utilizing the web could benefit the conservation approach (2006, p. 130-131). This can be significant for raising awareness regardless of how the silo is being used. For this purpose, the Turkish Grain Board needs to take the strings and starts execution for public awareness through media, interaction through engagement, and environmental consciousness through actions in adaptive reuse.

Currently, climate change and crises are the topmost important problems of the century. Sustainable development must be integrated into all disciplines, including heritage conservation and management, to reduce the impacts of these hazards (Déom et al., 2013, p. 1). Although it is not a dictated rule, responsiveness to the climate crisis and adaptability to its changes are expected from all design decisions.

In order to establish an alliance between sustainable development and the preservation of cultural heritage, one can be used to enhance the other. Beyond the traditional definitions, cultural heritage has the potential to expand its meaning to include sustainability (Déom et al., 2013, p. 62). Meaning the new reuse proposal

has to work in the framework of rural industrial and modern definition within the agricultural production, research, and development and contribute to the elimination of climate crisis's effects and sustainable development of the fields, settlements, and communities.

At this stage, it is vital to find a reuse proposal that would be able to accommodate all the discussed needs and demands of the principles. A **choice criterion** within the limitations of the silo and environmentally conscious design principles emerges for experts, decision-makers, and all other stakeholders to carefully analyze, assess and decide. The decision to choose the suitable reuse proposals would be up to the designers and architects who are willing to re-function the Ankara Güvercinlik Silo through a participatory process. As with many other reuse proposals for cultural heritage, these should be compatible, flexible, reversible, and feasible. Some examples could be named as smart agriculture, climate management and control, system integration and simulation, scientific and technological process, exhibition and experimentation, all within the scope of agricultural purpose and storage aspects of the building's origin. However, many other possibilities could appear in the future as the technical conditions, governments, people's priorities, ethics, built environment, and many factors change with time. The thesis **does not give an absolute answer to the question of deciding a reuse proposal** because the silo is still functioning and should continue to function for as long as possible. Thus, it is unclear when the need for adaptive reuse emerges. But when it comes to it, there needs to be guidelines and principles, which has been the scope of this thesis.

Nevertheless, there can be zones within the campus to regulate the process long before starting the new proposals. For adaptive reuse, the campus can be divided into three parts in terms of usage. There is an administrational area for organizational purposes, a residential part for the inhabitants, which also houses the sports facilities for social activities, and lastly, the agricultural section for the silo, workshops, laboratory, and warehouses. In that case, the adaptive reuse of the silo should focus on the changes within the agricultural section while understanding the qualities of the campus as a whole. Additionally, a new entrance from the west side could even

be provided for the reuse proposal aside from the existing two. This can regulate pedestrian and vehicular traffic inside and avoid unnecessary interference between different sections.

The structures in the other two parts are already functioning and are not directly dependent on the silo. These structures should continue to operate as they are. The TGB can make functional changes when necessary as long as it preserves the previously mentioned campus values in line with its needs.

Figure 4.21. Division of the campus in terms of usage(top) and the restrictions on adaptive reuse area with new possible entrances (bottom) (Author, 2021).

In the area of adaptive reuse, the currently working laboratory structure may also continue to serve the expected agricultural purposes. Abandoned warehouses and workshops can be used for the service of the silo and laboratory. In fact, if an entrance is opened from the western side of the campus, these re-functioned service buildings can also act as a transitional zone inside the area leading to the silo. Just like the silo, the warehouses and workshops have large open-plan interiors. Thus, they can be easily transformed through new installations within the restrictions of the same campus values. Moreover, in this area and around the silo, there can be events, tours, and other types of activities for public engagement. The existing mosque and museum on this part can be integrated for this new reuse proposal as well because the existing structures for these functions lack architectural quality and stay separated from the current accommodation area that houses the social events and other kinds of aspects.

When it comes to the silo, structural interventions are much more restricted for conservation purposes. The façade of the building should be the same as all silos in the network. This is crucial to keep the symbolic meanings and the image of the network unified for all. The emblem of the TGB on the facade, selected colors of the structure, and the bin configurations are the most significant elements of its exterior. Therefore, these are excluded from the intervention process even if the TGB loses ownership of the silo. These restrictions leave the exterior/façade changes limited to the areas where humans can occupy, unlike the bins, or areas that are non-visible to perceive from around, like the roof.

The interior of the silo is the place for major interventions where spaces and structural elements could be altered for reuse. Since silos are not experienced from their interiors, except for a few workers in limited areas for humans, the collective memory inside the machine-like structure can not be discussed like other types of industrial heritage. When there is a lack of interaction, and therefore a lack of memory, the need and desire to preserve interior spaces are reduced. Thus, interior spaces can be sacrificed for design strategies that will determine the future of the building. However, the equipment inside the silo is valuable due to its technological

and historical properties. Therefore, they should be kept in their original place and exhibited for the visitors and residents to see, learn and interact. Weighers, air cleaners, sieves, telephones, and most importantly, the elevator mechanism itself are some of the equipment that needs to be preserved in its original place. These, specifically the large and fixed main machinery, are located on the central core, and some of the equipment, primarily portable, exists on the conveyor floors. The industrial equipment is mobile in the conveyor floors because it needs to move from one bin lid to the other lid for operation. Meanwhile, the conveyor belts and metal pipes occupy most of the area, but they pale in comparison to the leading industrial equipment. This equipment is smaller in size and amount; thus, once the standard belts and pipes are removed or elevated to the ceiling in order to provide comfortable interiors, a space for regeneration can be easily obtained in the longitudinal space of the conveyor floors. At the same time, the mobile machinery can be conserved by being placed to an available side instead of getting removed completely.

Figure 4.22. Portable equipment in conveyor floors, with wheels (top left) or glides through the belts (top right) and the spacious upper conveyor floor with only belts and pipes (bottom) (Author, 2020).

Figure 4.23. Examples of fixed equipment to be preserved. Heads of the elevator (left) continue through the central core, and an image of a telephone (right) is mounted on a column that can be seen everywhere occupied by people (Author, 2020).

Figure 4.24. Examples of fixed equipment to be preserved in the central core. Weighers in the weigher floor (left) and sieves in the cleaner floor (right) (Author, 2020).

The bins provide the most volume in the structure, approximately 1540 m^2 land on both sides each and 30 meters of height, like an eight to ten story-high building. So, utilizing these areas would be beneficial for any reuse proposal. In order to provide openings and structural support without disturbing the exterior bin configuration, the best option is to make interventions through the top, which is the roof. The roofs on the wing sides are carried by the upper conveyor floor, which is more spacious than the lower one due to lesser and much smaller columns. The roof already needs to be overhauled due to poor insulation. Therefore, there is an opportunity to completely alter the roof to create openings for the interior of the bins on both sides. The skylight approach would solve the new areas' ventilation and natural lighting problems while providing proper insulation by requiring better roof technologies with glazing. This approach also decreases the structure's total load weight and reduces the compression on the reinforced concrete bin walls, which was the other main structural problem.

Thus, the space regeneration method solves the problems without changing the façade in a way that would make the silo lose its sculpturesque landmark aspect.

The alteration of space in bins and conveyor floors offers excitement and many possibilities for architects and designers. Additional structural components can support the carved-out interior from the inside, and suspended floors at different levels can be inserted if the reuse proposal demands. The upper conveyor floor can be partially eliminated for the openings depending on the design, or the lower conveyor floor can be enlarged or reduced in the vertical direction.

Meanwhile, the central core is much more restricted due to the limited area and the existence of many large fixed equipment. When the circulation on both ends, elevators, and machinery are excluded, smaller rooms for simple tasks appear for reuse proposals. The engine room on the first floor is an exception that should not be altered but preserved due to its importance for the overall system. Above this floor, the central core has its shorter bins which are smaller sized. However, these can not be opened from the top, or the structural elements can not be eliminated due to many more floors above the bins. Thus, the interior space can be altered, but it may not be occupied in the same manner as the other bins on the sides. That space could be used for infrastructure purposes or even for storage. However, its usage for human movement seems unlikely and may not even be necessary since the other areas already offer enough for the capacity the building can handle. Lastly, the terrace presents a view of the campus and the city, which means it would be in the best interest of designers and architects to provide proposals that utilize this aspect. The removal of the 90 tons water tank would allow the accommodation of new spaces and structural installations as long as it does not change the image of the silo.

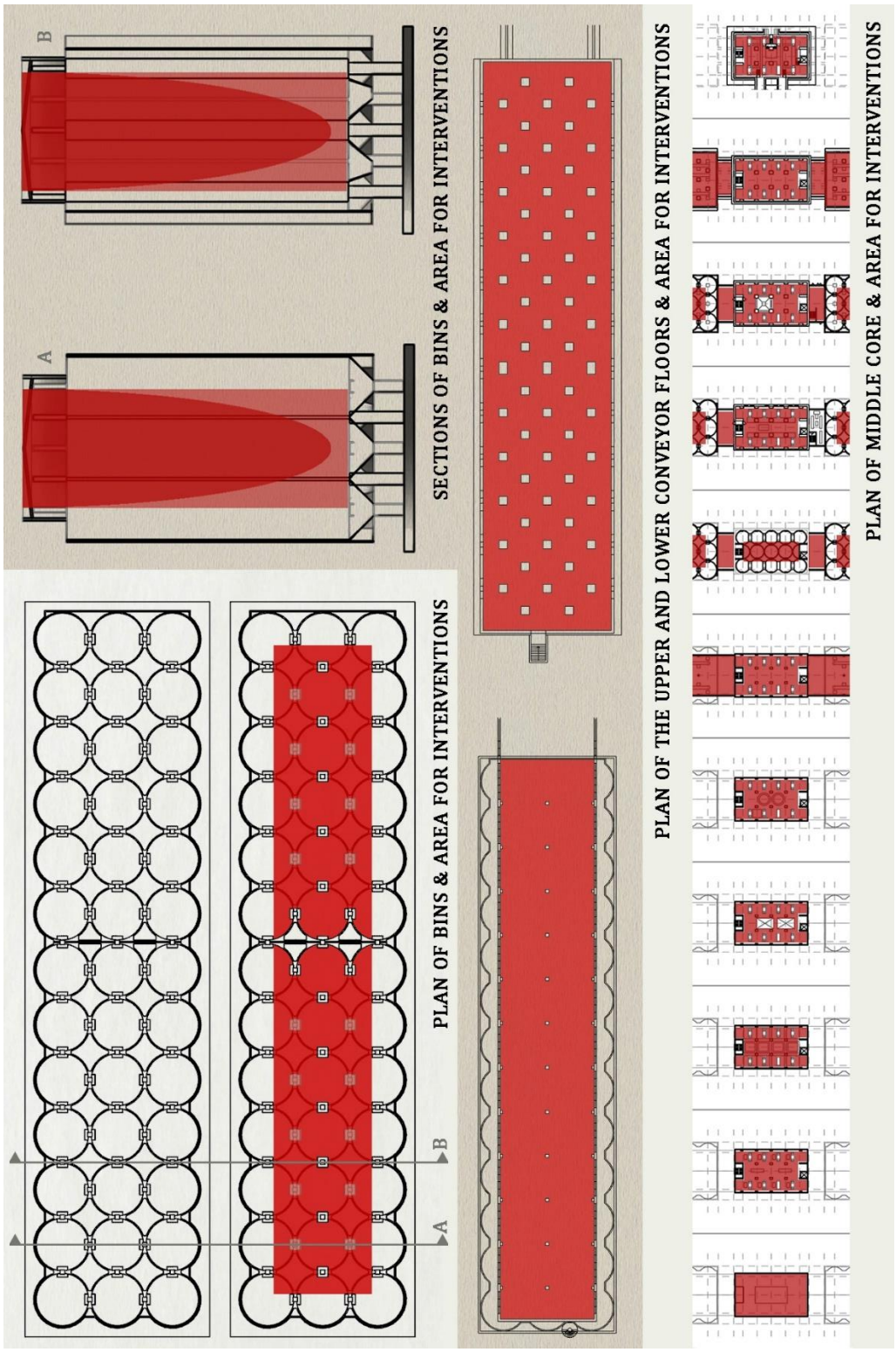


Figure 4.25. The interior spaces of the silo are highlighted in red for areas that allow interventions (Author, 2021).

In the end, the choice criterion in adaptive reuse lets the implementation of interventions that would be unharmful to the values of the building and the structural configuration itself; while encouraging new functions which enable the creation of unusual and unique interior spaces for the silo and attract human interaction.

This evaluation study and the determination of principles phase showed that to preserve cultural heritage structures, their understanding in regards to values, problems, and potentials is crucial as the conservation plan's first step. The values of the silo lead to detection of its significance as to why it matters within its context and why this structure is worth existing as a rural and industrial heritage place. Meanwhile, the problems and potentials sparked conversations on its future and were used for the development of its vision, which became a compass for the principles that would act as the strict guidelines and suggestions during the actions.

4.4.3 From Principles to Actions

The principles for the silo in various scales can be matched with the decisions in the action process and divided by their relevance through the function of silo or new adaptive reuse.

In organizational matters, the Güvercinlik Silo in its original use needs the conduction of a future management plan beforehand. This would ensure what should be preserved consistently and what aspects of the silo are open to reinterpretation. In this regard, it is necessary to connect silos nationwide in order to have consistency within the network. Therefore, the outer look of the silos, the placement of TGB logos, color palette, interventions for strengthening the structures, and functional additions should be determined and applicable to all reinforced concrete silos. The connection with producers and consumers for the agricultural storage of grains is essential to extend the duration of the first phase. For the structure to withstand this

period, the conduction of funds and research to predict and prevent harmful occurrences in terms of materialistic aspects are another priority.

When dealing with a silo that had significance on the historical, social, and economic development of the country in agriculture and modernization; conducting public awareness and connecting the structure with its past-present-future is a strategic decision to cement its place in people's lives, but also to assure that the silo can exist in the urban landscape due to the people's efforts. To do this, the usage of different media alternatives for exposure both internally and externally could be beneficial for the silo to be recognized as it is.

As the first scenario leaves its place to the second, conducting maintenance gains more importance against the risk of neglect. To make sure the structure adapts to current conditions, connecting with experts for further assistance becomes vital. Therefore, any structural deterioration can be avoided. Conducting adaptive reuse is the main goal if the silo cannot maintain its original function because then, it not only would be a loss of cultural heritage, but it also would be environmentally wasteful. However, the silo should not stray away from its agricultural roots during its adaptive reuse. Connecting with Atatürk Forest Farm semantically and, if possible physically, should be aimed, due to the past of this heritage. Conducting a regional planning strategy that focuses on this cause while connecting to transportation for better access to the structure is the fundamental principle for the reuse regardless of the new function. Railways are recommended in this phase not only because they are a better method against the crowded roadways, but they also connect with the AFF and nearby rural lands of the city. In terms of socio-cultural considerations, connecting with neighborhoods and conducting engagement are expected from the new reuse proposal for its acceptance and longevity. To do this, participatory decision-making and active involvement of stakeholders before and after its completion are recommended.

Meanwhile, for the campus, no matter what the scenario for the silo is, connecting with new technologies and conducting re-functioning decisions on the auxiliary

buildings of the silo and other facilities inside the campus are beneficial for silo work in unity as a system. This way, spatial relations between the structures can be strengthened as well. There would be no waste, but also a continuity of heritage in tangible and intangible aspects can be carried on. Connecting with a sense of belonging and conducting sustainable customs to back it up can keep the campus a living and ever-changing place that can keep on preserving its built environment. All things considered, the principles appear as musts for the future of the silo at all times.

The principles of the Güvercinlik Silo at various scales aim to protect the values of the site and encourage interventions that can be made for the further development and sustainability of the site and the silo. Therefore, the action process followed the directions of what the principles intended to achieve. For the significance of the silo and sustainable development goals, the first option was to use the silo as what it is. Because it is still in use with a lot of its values being present. Taking action long before the abandonment of the heritage would be an effective approach. In addition, the silo structures are designed for the storage of food, and with the rising threat of food shortage and climate change, they will be needed to feed masses in hard times, just like how the structure has always been intended to work. However, if it cannot be used as a silo or better options arise in the future, the second option was to utilize adaptive reuse. In that case, the campus was divided into three sections, and the silo and its auxiliary building of workshops and warehouses could be regenerated for new usage. The sculpturesque landmark character of the silo cannot be changed; therefore, the alterations were limited to the interiors and roofs within the preserved-bins approach in adaptive reuse categorizations made previously.

In this context, The Turkish Grain Board Silo in Ankara Güvercinlik was recognized for its values and significance and aimed to be conserved through an action process based on principles deriving from a vision. This way, it can become an example of how to approach and adapt sites of rural and industrial modern heritage in today's and tomorrow's cities, urban life, sustainable developments.

CHAPTER 5

CONCLUSION

Silos are industrial structures built for the advanced storage of rural products. In the modern period, with the introduction of reinforced concrete as a construction material, their architecture became more monumental, which made them significant icons of nations' agricultural production, industry, and development worldwide. Along with their benefits for the economic prosperity of communities, silos also inspired modern architects with their designs during the early 20th century. Their economic and architectural aspects caused silos to be used as symbols for social transformation and political propaganda by different governments, including Republican Turkey. Therefore, silos are significant structures that embody roles and values beyond industrial buildings.

The Turkish Grain Board Ankara Güvercinlik Silo shares these common aspects of silos, but also has features and meanings that are specific to itself. Due to its institutional identity as the Turkish Grain Board and being at the center of a silo network, the Güvercinlik Silo was responsible for the grain management of both the capital city and Turkey. It reflects the modernization of Ankara’s rural production and communities, as well. Thus, as the leading silo, it set an example for the implementation of not only agricultural function but also ideologies. Additionally, its place in the historical agricultural lands of the Atatürk Forest Farm made the case more unique and meaningful.

As a rural and industrial heritage site, Ankara Güvercinlik Silo can face privatization, abandonment, or demolition threats like many other silos in Turkey and the world. The Turkish Grain Board, to which it is affiliated, recognized these risks and even invited architecture and design schools to make proposals for re-functioning through letters. Although this proposal was later abandoned, it pioneered the necessity of

investigating the conservation problems of the Güvercinlik Silo to generate principles for its continuation in the future and set an example for all rural and industrial heritage places. Thus, the letter of TGB requesting for developing ideas for the future of the TGB Ankara Güvercinlik Silo has been the main motivation behind this thesis.

The thesis aimed to reveal the principles and strategies for the conservation of the Turkish Grain Board Ankara Güvercinlik Silo. In order to do this, a method was generated to determine these principles within the framework of values and significance. This research method consisted of field studies, archive searches, and literature reviews. While field studies revealed the unique values and problems of the building and its local context, archival studies shed light on the historical importance of the building, its institutional identity, and its national development over time. Meanwhile, the literature research has revealed the improvements in agricultural storage worldwide, the effects of silos on architecture and urban landscape, and different perceptions of communities towards them. Also, examining re-functioned silo examples from around the world was necessary for comparative studies and evaluating the future possibilities. In this way, the awareness of the values of silo structures in the field of conservation and how faithfully these values are adhered to or referenced in their reuse could have been seen. Thus, the identification of the different approaches made it possible to predict the results of the actions to be taken.

5.1 Results of the Thesis

Silos should not be evaluated as stand-alone structures. They possess more properties than just being machine-like objects as intended. In this regard, it was crucial to have guidelines that reframed the silos for the conservation process. The reframing of silos focused on the most significant aspects of the structure and how they came together. Rural, industrial, and modern attributes are the key qualities of silos. These structures affected production lines and societies through their spaces while industrializing

rural production and modernizing rural communities. The architectural, social, and economic significance of silos results from the intersection of these attributes. Their contribution to the modernization of society and becoming a symbol for various ideologies gave them social aspects. Their role as a storage facility in agricultural production and enabling developments led to economic benefits. Lastly, the sculpturesque character formed through the function provides a unique architectural character. These qualities, leading to their values, are common for all silos because they have been implemented worldwide for the same purpose and affected their surroundings similarly due to their nature and function.

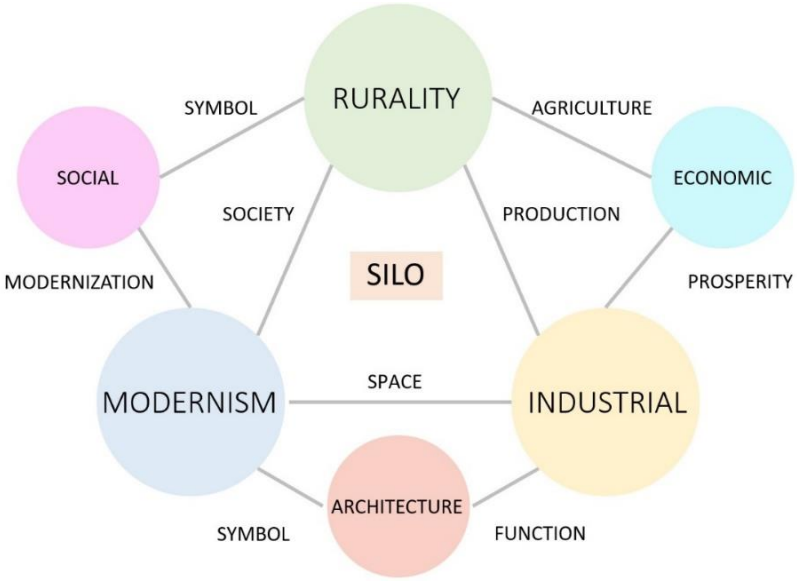


Figure 5.1. Reframing of silo for heritage conservation (Author, 2021).

In the light of this reframing, the common values of silos can be examined physically and contextually. Their form and material are the most prominent qualities of silos in physical aspects. The vertical, monumental and modular form consists of repeated tall cylinder bins with no openings on the facade. Along with the use of reinforced concrete material, a new technology of its time that allows large-scale constructions with curvilinear geometries creates a sculpturesque building unique for silos. This

sculpturesque character is what inspired the architects to develop modern architecture.

Meanwhile, in contextual aspects, the form follows the function of storage as an industrial entity. This storage characteristic provides better and extended trade activities of import and export both globally and at home. It also enables the excess product to be kept for assurance in hard times and gives a sense of food security. The location of silos indicates its rural character by providing links between the rural and urban in perimeters. Its significance in these settlements is crucial as they affect socio-economic matters by providing modernization and prosperity. Then the sculpturesque quality enables the silo to become a landmark for these socio-economic benefits.

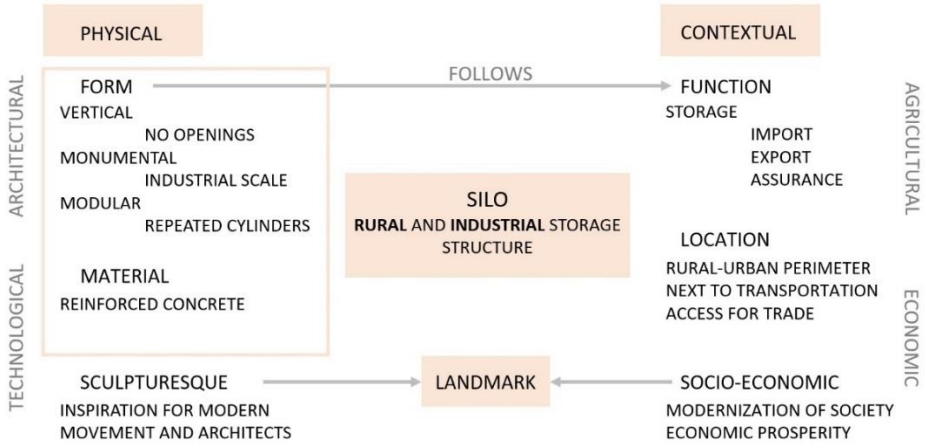


Figure 5.2. Values of silos (Author, 2021).

Therefore, accordingly, all silos have architectural and technological values from their form and material, industrial properties, and the use of reinforced concrete. The sculpturesque aspect emerges as a result of these. Agricultural and economic values come from functional and locational properties of being rural and industrial structures supported by socio-economic benefits. Lastly, these two sides coincide at

the silos becoming landmarks symbolizing these values as rural and industrial heritage structures through their architecture.

In adaptive reuse, the most crucial thing to preserve in silos is the sculpturesque architecture based on these values and characteristics. Since the bins of a silo emerge as the most significant part of the structure due to their function and physical appearance, they became the main criteria in categorizing the previous interventions. In terms of architecture, symbolism, and integrity of the silo, the interventions for the reuse of silos are divided into three according to the additions on bins, removals on bins, and preservation of bins. Additions and removals alter the façade of the bins in a way that distorts the perception of the structure. The changes in the mass quality of the façade effects the sculpturesque character of the bins. However, the preserved approach is more conscious of this quality and encourages changes that are mostly limited to interiors or elements that do not alter its perception.

	ARCHITECTURAL	SYMBOLIC	INTEGRITY
ADDITIONS ON BINS	FACADE UNRECOGNIZABLE	SCULTURESQUE APPEARANCE LOST	MASS PERCEPTION LOST
	INTERIOR CIRCULATION	LANDMARK UNRELATED TO BINS	CONTEXTUAL NOT AGRICULTURAL
REMOVALS ON BINS	FACADE RECOGNIZABLE	SCULTURESQUE ALTERED BINS	MASS WEAKENED SURFACE
	INTERIOR CIRCLE PLAN SPACES	LANDMARK GEOMETRY CHANGE	CONTEXTUAL NOT AGRICULTURAL
PRESERVED BINS	FACADE PRESERVED	SCULTURESQUE PRESERVED	MASS PRESERVED
	INTERIOR BIG CHANGES	LANDMARK NEW CONTEXT	CONTEXTUAL EXPANDED MEANS

Figure 5.3. Categorization of interventions on silo bins (Author, 2022).

Thus, these first analyses of the thesis study show the reframing of silos and their common values in order to evaluate the intervention decisions worldwide and determine the most suitable approach for the future in the case of adaptive reuse.

Silos' differences and authenticity come from the national and local characteristics they gain after construction. At this stage, the significance of the Ankara Güvercinlik Silo had to differ from the others. Thus, its identity coming from the Turkish Grain Board and its local values as the Güvercinlik Silo in Yenimahalle were needed to be examined. In Turkey, silos' role in the modernization and development of the society during the early Republican era and the existence of the Turkish Grain Board as a public economic enterprise shaped their identities and people's perceptions of them. As a nationwide network, rapidly constructed silos and the TGB worked to improve the lives of underdeveloped rural communities, help them be included in the modernization process and empower the nation to compete in the global agricultural market.

Meanwhile, Ankara Güvercinlik Silo differs by its local values as a silo in the Yenimahalle District of the capital city. Built on what is left of the historical rural area of forest farmlands of Ankara today, the Güvercinlik Silo has become the center of the network after its completion. It not only served for the agricultural production and research in the region but also played a part in the development of its neighborhood indirectly. However, the silos in Turkey are not stand-alone structures, but they have been accompanied by campuses. The campus in Güvercinlik is responsible for providing services for the silo and TGB as an institution. Administration, training, sports, and accommodation facilities of TGB exist across the labs, workshops, and warehouses for silo's direct operations. This campus is surrounded by the railways on the south and roadways on the north for the silo to operate through the vehicles coming from these transportation means.

Like many others, Ankara Güvercinlik Silo consists of elevators, bins, conveyors, and intermediary floors of garner, distribution, weigher, engine, and cleaner for the advanced storage of goods. First, the collected grain from vehicles is carried to the

elevator head from the elevator pit. Then the grains are garnered, weighted, and distributed to the conveyors for long or short-term storage on the bins. Later, when it is time to give away the grain, it is transferred to the lower conveyors, cleaners if desired, and then back to the vehicles. Meanwhile, the human movement inside the silo is limited due to the bins not being suitable for occupation.

When it comes to the current context, the surrounding of the silo and campus have changed drastically. The neighborhood had turned into a busy commercial district instead of rural farmlands. The railways stopped working for the silo, and the roadways became too crowded for large grain-carrying vehicles to operate. At the same time, TGB aims to quit operating its silos and assign licensed warehousing to take its place for storage nationwide. The campus has also shown some changes as buildings convert to different functions or customs within the personnel and residents are altered through top-down decisions of the authority figures. At the same time, the silo, which was registered as a cultural asset, tries to keep up with its function and has not changed much aside from a few physical differences. The most prominent addition appears as the strengthening metal layer on the lower half of the reinforced concrete bins due to the deformation from the load of grains. The water insulation problem of the silo is also damaging to the structure. Lastly, the changes of steep angles and steel material in the roof part of the vehicle grain-loading area and the horizontal stripes of green paint on the facade of the silo contradict its architectural configuration.

Due to the silo’s effects at different scales, evaluating the structure and revealing its values has been necessary to answer the research question of determining future principles and decisions. In network-scale, it is challenging to determine all the values of the network due to many factors outside the thesis's scope involving other silos. Therefore, there is only mention of values in regards to the Güvercinlik Silo. Turkish rural and industrial development history and the Turkish Grain Board identity are the most significant values as they separate the Turkish silos from other examples. Its contribution to the grain trade in the country and international market, the advanced storage facilities it offers, and its aim at easy access to grain helped

communities under challenging times. However, the biggest visible shortcoming is the lack of a structure-oriented conservation management plan for the future of the silos. In addition, silos that the urban growth have swallowed cannot fulfill their functions and lose their economic impact or intended perceptions. This causes loss in social life and collective memory. Furthermore, they become distant from the rural landscapes, and this causes some campuses to disintegrate. This would eventually lead to the loss of social life and customs.

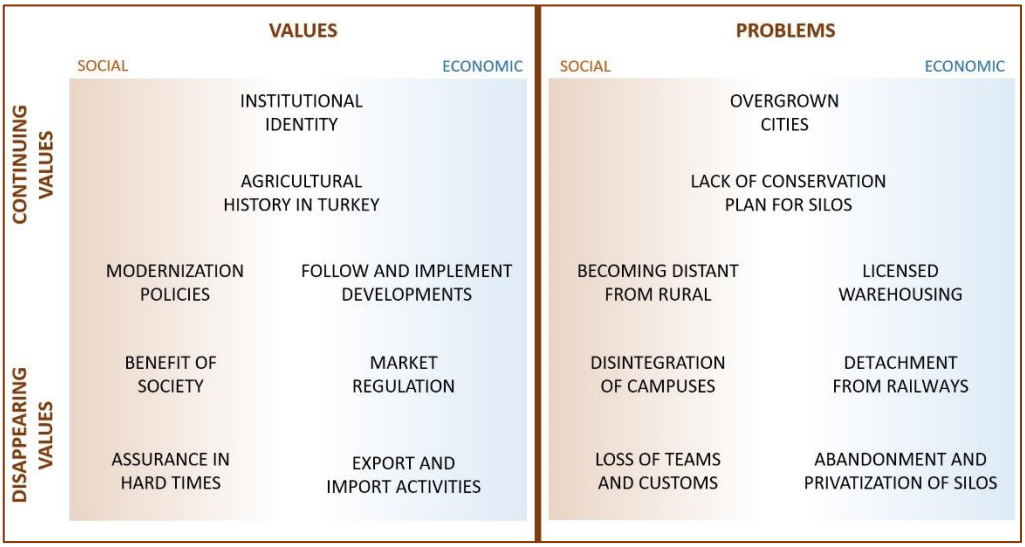


Figure 5.4. Values and problems of the silo in relation to the network scale (Author, 2022).

On the campus-scale values, it is essential both socially and economically that the campus is located in a part of the old Atatürk Forest Farmlands, and it is still in operation for an agricultural cause. The campus has many facilities for workers and residents; thus, it provides an active social life and customs. These facilities also enable various services for producers in the form of agricultural research and lab analysis. Meanwhile, multiple problems appear primarily because of urban developments. The transformation of Forest Farmlands to a busy commercial district makes the site lose its core values socially and economically. This changed the site's

users, from producers to consumers. The traffic type went from agricultural vehicles to many varieties, and the density increased. Since the railways are not being used for the silo anymore, the campus and silo rely on roadways that can no longer easily accommodate large vehicles for grain transfer, and the lack of better walkways is blocking access for pedestrians.

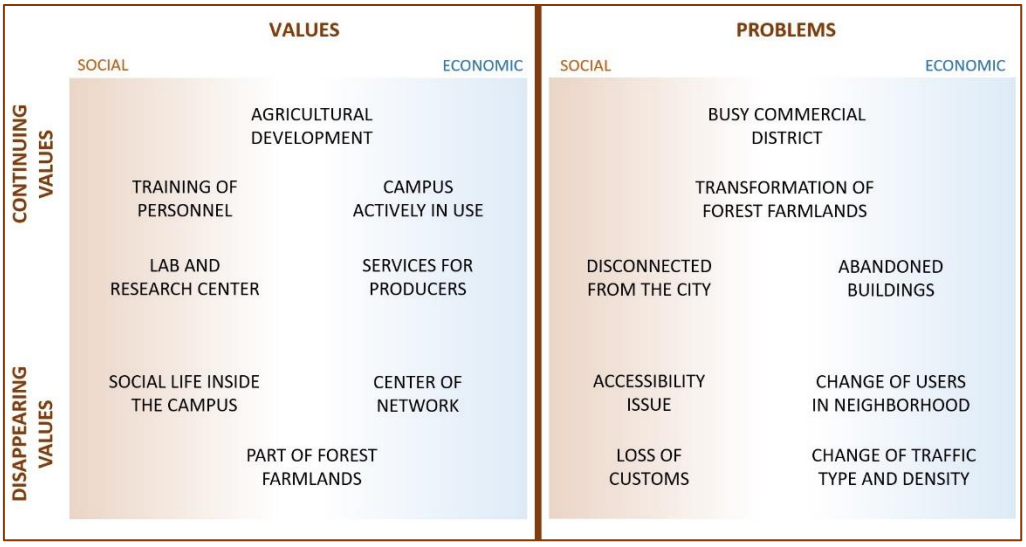


Figure 5.5. Values and problems of the TGB Ankara Güvercinlik Campus (Author, 2022).

Technologically, the Ankara Güvercinlik Silo's original equipment and machinery are preserved and still in use. Also, architecturally, the structure is almost unchanged except for minor additions. The silo shares the values of the network as it contributes to the modernization of the communities in rural Ankara. However, it now has a lesser impact due to administrative decisions. It was a bridge between the underdeveloped rural life and developing urban settlements in Ankara. It also became the spatial representation of the board's identity and growth in the agricultural industry while having a place in the collective memory of the rural communities. However, loss of monumental perception, changes of scale, and rapid urban growth became problems of the silo. There is also the thread of abandonment

and privatization due to licensed warehousing. When it comes to the physical problems on the silo, the deterioration of the water insulation and the weakening of the reinforced concrete on the lower half of the bins are threatening.

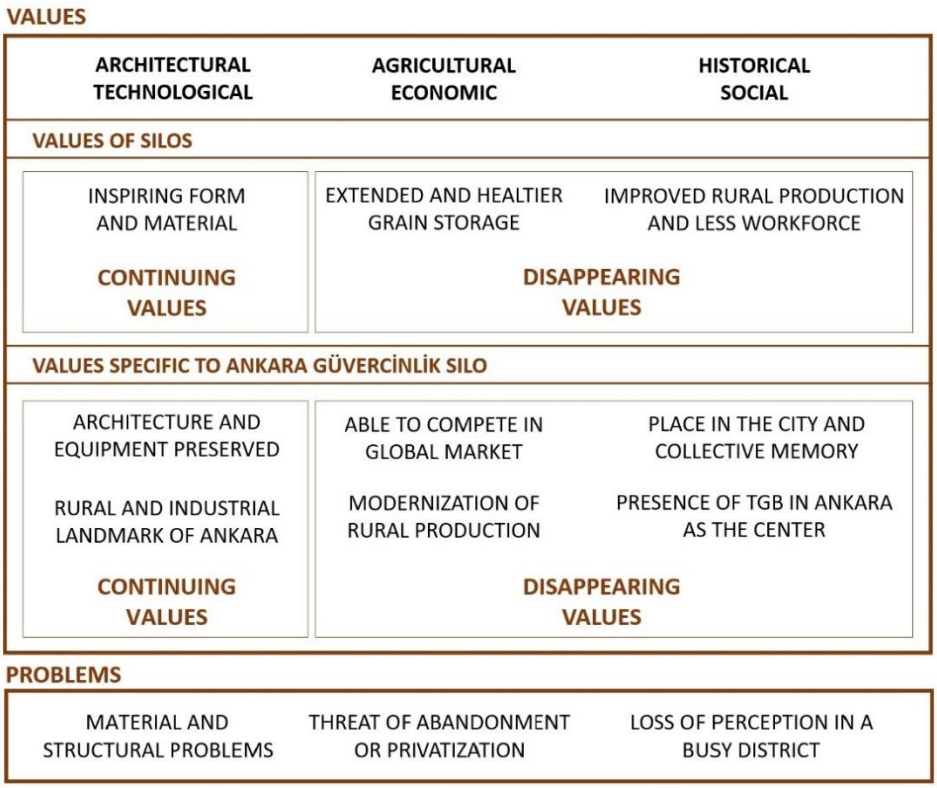


Figure 5.6. Values and problems of the TGB Ankara Güvercinlik Silo (Author,2022).

From there on, the values can lead to the significance of the case. Silos act as a bridge between rural and urban settlements and communities, agriculture and industry in terms of development, and production and consumption cycles as an entity that contributes to both for storage. The silo symbolically reflects the modernization policies through its architecture, which comes from its form and material. Its monumentality and the use of new material have made it a landmark. Meanwhile, as a part of the Turkish Grain Board network, Ankara Güvercinlik Silo turns to be a node for activity. Thus, the silo appears as the node of landmark at the interfaces.

These assessments of values, problems, and the significance derived from them appeared as the second major outcome of the thesis study as it highlights the importance of TGB and Ankara Güvercinlik.

After these, the determination of a vision will guide actions for future decisions. It is difficult and somewhat unrealistic to demand drastic changes in scales other than the building itself. However, within the borders related to the silo, suggestions are proposed. Re-connection and re-conduction of general aspects regarding the structure, nearby surroundings, and national strategies will be the principles for the conservation plan. The regeneration of the silo is expected to be planned in two scenarios with a priority of the first one over the other. The first scenario is to preserve the silo as it is and keep it operating until it cannot. If the first scenario ends, the second scenario would be about a suitable adaptive reuse proposal based on the research conducted from the examples around the world.

Principles in network scale within the scope of the Güvercinlik Silo emerge as suggestions. Re-connection is essential to strengthening the network and the silos' ties with the institution and people. Meanwhile, re-conduction aims to ensure proper management, establish administrative requirements, and prepare research for conservation strategies of the silo structures. Conducting engagement with people and providing access for the public to interact with this heritage comes in line with this foundation.

On the other hand, campus-scale principles aim to strengthen the relations between the city and neighborhood. Within the organizational matters, connection with Forest Farmlands is necessary to maintain the spirit of the place by supporting agricultural production and rural communities. The implementation of new technologies within the campus and interaction with the producers and consumers can enable a sense of belonging and thus, provide continuity in the campus. Conduction of regional planning specializing in the involvement of the TGB campus in the development of the district is another step in this direction. Relations between railways and the neighborhood need to be strengthened and be more interactive physically and

contextually. Settlement and traffic type and density should be reconsidered in upper-scale regional planning to better accommodate large vehicles for grain transfer and enable pedestrian movement around the site. Architecturally, the campus buildings need to connect with new technologies that integrate the latest developments in agriculture. When re-functioning the campus facilities, the structure itself should be consolidated and repaired instead of total change. The customs and traditions of the residents and personnel should be decided by inhabitants themselves. Connection with a sense of belonging will ensure long-term continuity through active participation in events and decisions.

Silo scale principles highlight the importance of materialistic aspects and needs, interdisciplinary research, and public awareness during the process. Connecting silo to transportation lines and providing access from railways are some of the desired outcomes. In a more general way of stating the issue, it may be necessary to review the means of access to the silo. The silo should work in its original use as long as possible. However, it is right to assume that functional change in the future is possible. Therefore, conducting adaptive reuse principles and proposals beforehand is crucial. Connection with the past, present, and future is the key goal in sustainability. The silo should continue as a rural and industrial heritage. One obvious need in this regard is to conduct public awareness through local events and the use of mainstream and social media, as it is the age of communication. Existing physical conditions, risks, and requirements must be taken care of within the stakeholders' best interest. It is crucial to start necessary interventions by connecting with professionals to identify problems, develop criteria, and assess the impact of interventions. Additionally, there is a need to conduct maintenance. Repair and consolidation work followed by periodic monitoring and noninvasive equipment is necessary.

In the regeneration of the silo, two foundational approaches are encountered in preparing for the actions. First, the primary aspects of being a silo are derived from its values centered around its rural, industrial, and modern character. Then, there are considerations for design decisions in current conditions of world affairs. This is

emphasized through the silo because these structures were always charged to store food to prevent communities from famines. Thus, in the face of the risks and inequalities posed by the global climate crisis, it would be a strategically meaningful choice for silos to continue to function for the benefit of society. The Ankara Güvercinlik Silo should preserve its sculpturesque landmark qualities in addition to its function and always accommodate the agriculture and storage aspects.

In this case, the decision to be made is the regulation of the management. It could either continue to work under TGB or be rented for licensed warehousing. Conservation of its identity is crucial. Thus, all silos in the country should be under the surveillance of TGB regardless of ownership.

If the silo cannot continue to work in its original function, the second scenario to develop adaptive reuse begins within the management plan. When that time comes, The silo structure stands out with its sculpturesque presence as a landmark beyond its internal storage features due to the lack of human interaction and collective memory. Because of these, the preserved-bins approach emerges as the ideal solution of interventions for the exterior appearance of the silo.

The reuse proposal must comply with silo-specific values as well. Rural and industrial aspects should not depart from the framework of modern development. Thus, it would still relate to agriculture, production, and modernization. Potential adaptive reuse scenarios should conserve and extend silo's meaning by creating interfaces between different occupations and then banding them together as a node that would be recognized as the landmark for these interfaces. Compatible design strategies and participatory decision-making can determine these different occupations that would re-function the silo. Instead of one-dimensional purpose directed with top-down decisions, an approach that focuses on the community's needs and demands while addressing the problems of the structure with compatible solutions can provide sustainable development and its goals for the environment and people. Therefore these principles and actions with the following scenarios constitute the last part of the thesis research.

Furthermore, as an additional benefit to the field of rural and industrial heritage, the conservation vision and decisions of the Güvercinlik Silo can set an example for the other silos as a leading case study of the topic. Both in Turkey and the world, the issue of silo conservation can benefit from reframing the concept and following primary principles with the scenarios approach for the regeneration as conducted in the thesis. People who will work on Turkish silos can learn more from this study due to the shared history and identity of the Turkish Grain Board. However, in terms of approach and sustainable solutions to the environment, it will set an example for all silo reuse proposals globally due to the global character of the silos as being agricultural storage structures.

5.2 Further Research Topics

The thesis answers the research questions regarding the formation of research methodology and framework for the conservation of silos as a rural and industrial heritage, its values, and the significance of the Güvercinlik Silo as an architectural and institutional entity. All opportunities and challenges for the future of the Ankara Güvercinlik Silo were also revealed under principles and actions. However, on the other hand, there are some lacking aspects that could not be conducted during the thesis.

First of all, research on material analysis was found to be lacking in the conservation of modern heritage studies, especially on the preservation of reinforced concrete structures. Due to the pressure exerted by the tons of grain it carries, the deformation seen on the surfaces of the bins could not be deeply studied because sufficient resources could not be found to create possible solutions for the structure. Therefore, the existing reinforcing metal layer was accepted as it is. Further solutions, perhaps an internal load carrying structure, are encouraged for engineers to produce later on.

Additionally, the thesis had determined spatial and interventional limitations on how to function while conserving the architectural features of the silo, but specific

proposals for the program and spaces with certain boundaries have not been presented. There are two reasons for this. Firstly, the decision to choose another function for the second scenario was left for the architects of the future because it is uncertain when the silo will lose its function; therefore, the technological abilities, needs, and demands of the existing conditions may be insufficient for the long run. The second reason is the inability to conduct social surveys and similar studies with the stakeholders due to the Covid-19 pandemic. The participatory process is an essential part of the design process, along with the compatibility of the interventions. It is vital to get the opinions of stakeholders like workers, residents, and various decision-makers for a definite proposal. Thus, the thesis remained open to research in this regard, so that the further process can be a participatory approach.

Another research that could not be done for the Ankara Güvercinlik Silo was to analyze and research the network itself in a comprehensive study. The study in the network scale appears to be on a surface level that only focuses on the things that are directly related to the case at hand. Even the comparisons with other silos and campuses could only be made through online maps and sources due to travel restrictions. However, since it would be a new thesis topic to delve deeper into the network itself and study each silo one by one, only the parts that directly concerned the TGB Ankara Güvercinlik Silo has been examined, and the comparisons with other silos remained to external architectural qualities. Further research can be prepared in a network-scale study that proposes a conservation management plan for the TGB as an entity and every existing silo of the network regardless of their location and typology. Moreover, other campuses and silos should be studied for a better understanding of the issue on every scale and aspect, including the physical, functional, social, and economic contexts.

As of now, the actions for the regeneration of the silo, whose values and significance were determined within the scope of the thesis, were developed based on principles, and possible solutions were left to be created further in scenarios within the proposed framework. The criterion for better adaptive reuse lies in the execution of these further research topics. Other principles could also be established, and depending on

the limitations, the nearby surrounding and its context can be transformed accordingly as well. As long as the main principles and strategies resulting from this thesis are acknowledged, the future of this rural and industrial heritage is open for interpretation to serve the agricultural development and modernization of the people’s lives.

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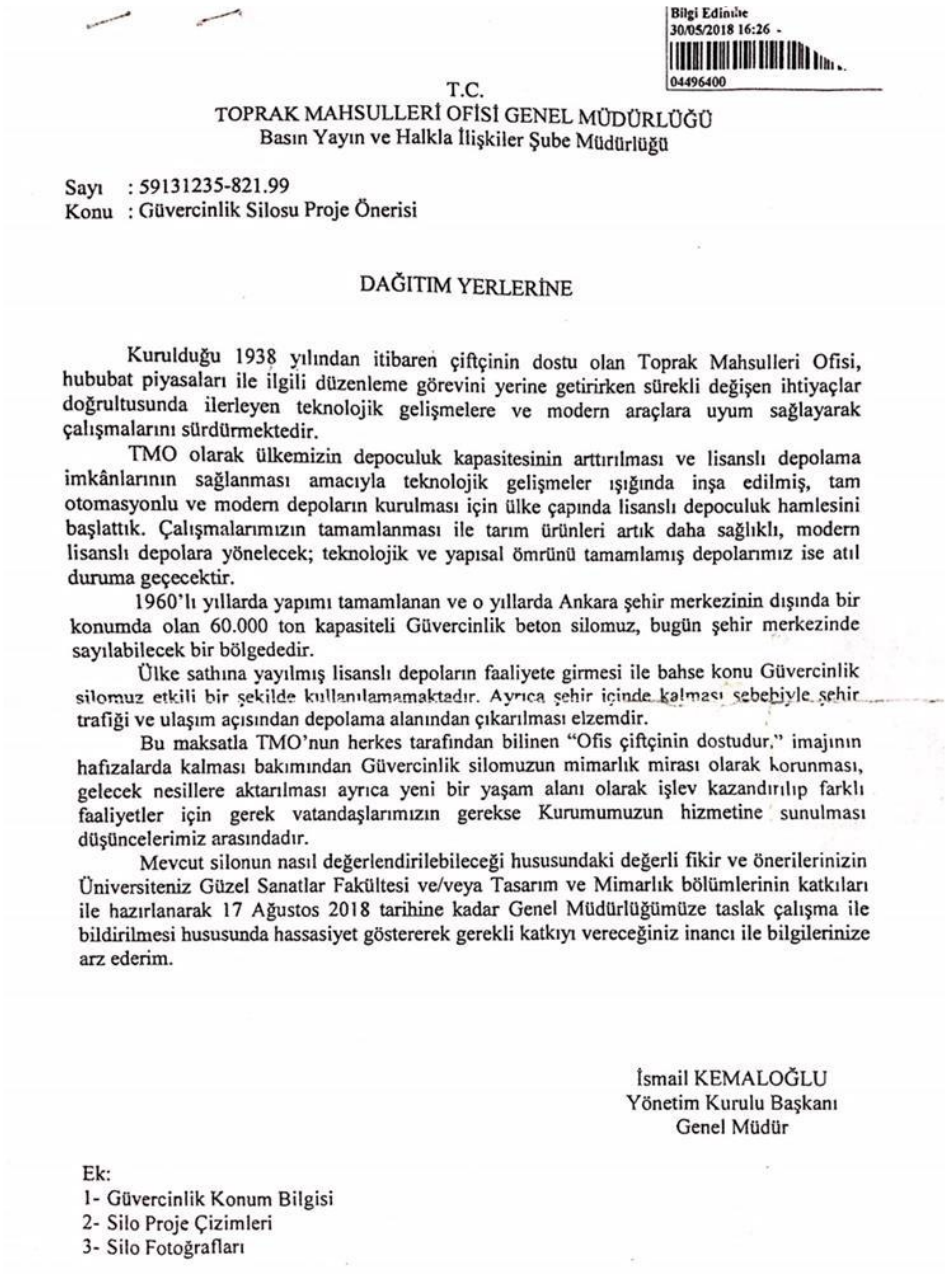
APPENDICES

A. The letter of invitation for re-functioning projects sent to the schools of architecture and design in Ankara



Bilgi Edinme
30/05/2018 16:26 -
04496400

T.C.
TOPRAK MAHSULLERİ OFİSİ GENEL MÜDÜRLÜĞÜ
Basın Yayın ve Halkla İlişkiler Şube Müdürlüğü

Sayı : 59131235-821.99
Konu : Güvercinlik Silosu Proje Önerisi

DAĞITIM YERLERİNE

Kurulduğu 1938 yılından itibaren çiftçinin dostu olan Toprak Mahsulleri Ofisi, hububat piyasaları ile ilgili düzenleme görevini yerine getirirken sürekli değişen ihtiyaçlar doğrultusunda ilerleyen teknolojik gelişmelere ve modern araçlara uyum sağlayarak çalışmalarını sürdürmektedir.

TMO olarak ülkemizin depoculuk kapasitesinin arttırılması ve lisanslı depolama imkânlarının sağlanması amacıyla teknolojik gelişmeler ışığında inşa edilmiş, tam otomasyonlu ve modern depoların kurulması için ülke çapında lisanslı depoculuk hamlesini başlattık. Çalışmalarımızın tamamlanması ile tarım ürünleri artık daha sağlıklı, modern lisanslı depolara yönelecek; teknolojik ve yapısal ömrünü tamamlamış depolarımız ise atıl duruma geçecektir.

1960'lı yıllarda yapımı tamamlanan ve o yıllarda Ankara şehir merkezinin dışında bir konumda olan 60.000 ton kapasiteli Güvercinlik beton silomuz, bugün şehir merkezinde sayılabilecek bir bölgededir.

Ülke sathına yayılmış lisanslı depoların faaliyete girmesi ile bahse konu Güvercinlik silomuz etkili bir şekilde kullanılamamaktadır. Ayrıca şehir içinde kalması sebebiyle şehir trafiği ve ulaşım açısından depolama alanından çıkarılması elzemdir.

Bu maksatla TMO'nun herkes tarafından bilinen "Ofis çiftçinin dostudur." imajının hafızalarda kalması bakımından Güvercinlik silomuzun mimarlık mirası olarak korunması, gelecek nesillere aktarılması ayrıca yeni bir yaşam alanı olarak işlev kazandırılıp farklı faaliyetler için gerek vatandaşlarımızın gerekse Kurumumuzun hizmetine sunulması düşüncelerimiz arasındadır.

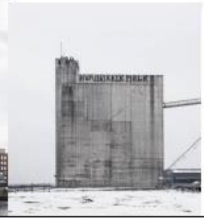
Mevcut silonun nasıl değerlendirilebileceği hususundaki değerli fikir ve önerilerinizin Üniversiteniz Güzel Sanatlar Fakültesi ve/veya Tasarım ve Mimarlık bölümlerinin katkıları ile hazırlanarak 17 Ağustos 2018 tarihine kadar Genel Müdürlüğümüze taslak çalışma ile bildirilmesi hususunda hassasiyet göstererek gerekli katkıyı vereceğiniz inancı ile bilgilerinize arz ederim.

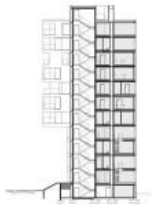
İsmail KEMALOĞLU
Yönetim Kurulu Başkanı
Genel Müdür

Ek:
1- Güvercinlik Konum Bilgisi
2- Silo Proje Çizimleri
3- Silo Fotoğrafları

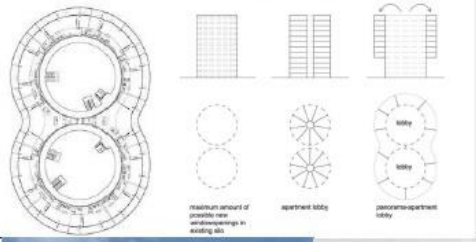
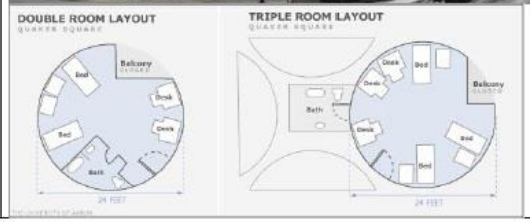
The Turkish Grain Board, 2018.

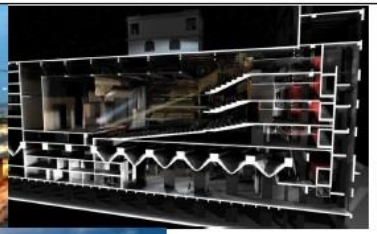
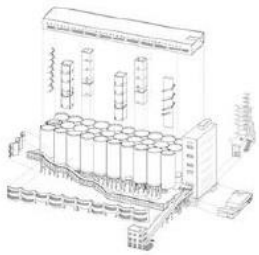
B. Study on adaptive reuse projects of silos in the world by the author

Country/ City	Name/Firm	Function	Photo	Source	Additional Info
Denmark / Copenhagen	The Silo / Cobe	Luxury housing	  	https://www.cobe.dk/place/the-silo	2017, 10.000m2 residential complex with public facilities at the ground and top, overcoat with 3d modules
USA Baltimore Maryland	Silo Point / Turner Development	Luxury condominiums, residence	  	http://www.turnerdevelopment.com /home/#silo-point	Used to be the largest and fastest silo in the world
Norway / Oslo	Grünerløkka Studenthus / HRTB Arkitekter AS	19-story student housing complex	 	https://hrtb.no/prosjekter/otium/	1991-2001, kept the circular plan layout

Denmark / Løgten	Siloetten / C. F. Møller Architects	"rural high-rise" with 21 high-end apartments	  	https://www.cfmoller.com/p/Siloetten-i2029.html	2004-2010, around the tower, the apartments are built up upon a steel structure in eye-catching forms
South Africa / Cape Town	V&A Waterfront Museum / Thomas Heatherwick	Waterfront art museum	 	http://www.heatherwick.com / projects/buildings/zeitz-mocaa/ https://inhabitat.com/thomas-heatherwicks-va-waterfront-gallery-in-cape-town-will-be-carved-from-an-old-grain-silo/	2011, galleries carved from silos' cellular concrete structure, while an overhead roof will be opened to create an expansive atrium flooded with light
Australia / Bunbury	Wheat Silo Apartments	residential	 	https://www.swtimes.com.au/news/south-western-times/silos-cash-boost-to-fix-significant-cracking-ng-b88982170z	Eight-story luxury residential extraordinary and unique features

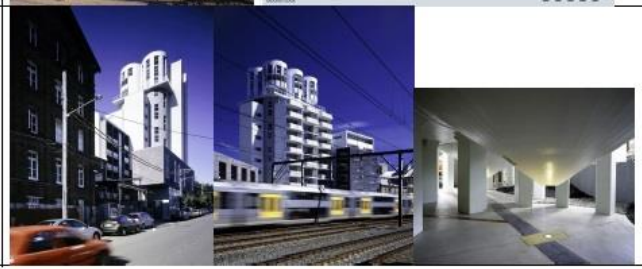
Netherlands / Amsterdam	Silos Zeeburg / NL Architects	COMPETITION NOT BUILT silos dedicated to climbing, sports and culture	 	http://www.nlarchitects.nl/slideshow /173	Silo consists of two theaters with dressing rooms and rehearsal spaces, spaces for workshops, exhibition spaces, music studios and a space for hair design
Norway / Kristiansand	Silosamlingen / Mestres Wåge Arquitectes and Mx_Si Architectural Studio	COMPETITION being built Art museum	 	https://www.archdaily.com/802177/winners-announced-for-norwegian-competition-to-convert-grain-silo-into-art-museum?ad_medium=gallery	2016 competition, 2017 construction started, cuts in the silo's interior, in order to open the space up to more light and create a sense of character for the new museum
Iowa / USA	Don Briggs	Ice climbing wall	 		Covered with ice curtains
Malmö / Sweden	Malmö crematorium "vertical cemetery" / Fredrik Thornström and Karolina Pajnowska	STUDENT PROJECT crematory and columbarium	 	https://www.dezeen.com/2016/01/27/silo-crematorium-malmo-house-living-dead-students-fredrik-thornstrom-karolina-pajnowska/	two cylindrical buildings: crematory and columbarium – a house for the dead – and the second would be a housing development – a house for the living

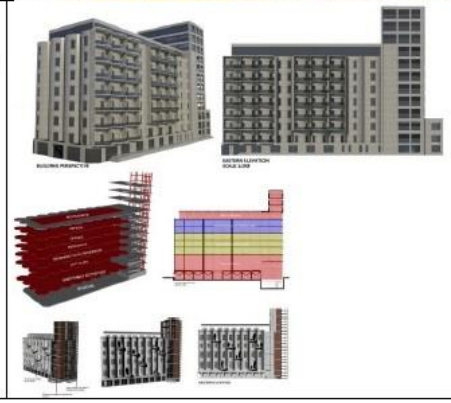
Denmark / Copenhagen	Frøsilo / MVRDV	Residential	 	https://www.mvrdv.nl/projects/143/fr%C3%B8silo	2005, openings in the concrete rings
Akron, OH / USA	The Quaker Square Inn	Hotel in university campus (students use it)	 	https://www.quakersquareakron.com/	

Marseille / France	Silo Opera House / C + T Architectes	Opera house	  	https://inhabitat.com/abandoned-grain-silo-converted-into-arenc-silo-opera-house-in-marseille/ https://inhabitat.com/abandoned-grain-silo-converted-into-arenc-silo-opera-house-in-marseille/silo-opera-house-ct-architectures-13/	2011, the large theatre space was carved out of a hollow area in the center
Shangai / China	The Minsheng Dock Silo / Atelier Deshaus	cultural space, for art exhibitions mainly	  	https://www.archdaily.com/901937/atelier-deshaus-transforms-shanghais-riverfront-in-3-cultural-projects?ad_medium=gallery http://www.deshaus.com/En/Script/detail/catid/8/id/19.html	2017, *"Flow of circulation must be organized so as to integrate these two spaces. The strongest move there is a series of hanging escalators that introduces the people from three different levels directly to the top exhibition hall. Besides the exhibitions, visitors could also enjoy the spectacular views of the north Huangpu River and the entire Minsheng Wharf. The silos per se almost left untouched; thus, a juxtaposition of the new energies instilled and the original façade could be sensed. Such a move cuts straight into the major conflict faced with silo transformation: how to acquire certain openness when enclosed warehouse is made a public cultural space, and how to establish new senses of time and site?"*

Guangzhou / China	Silo-top Studio / O-office Architects	office / workshop	   	https://www.archdaily.com/489387/silo-top-studio-o-office-architects?ad_medium=gallery	2013, office at the top, vertical core at the side, silo as storage (keeps usage) at the bottom expo exists?
Oulu / Finland	The Tervahovi Silos / PAVE Architects	residential	  	https://www.archdaily.com/887591/the-tervahovi-silos-pave-architects	2014, most of the old structures had to be dismantled due to their poor condition, round silo structures became utilized as varyingly sized balcony zones. The balcony openings are enhanced with metal trelliswork that maintains the round shape of the silos

Buffalo / USA	Silo City proposal "New Age Bauhaus Movement" / James Jacobik	THESIS PROPOSAL Public showcase	 	https://www.buffalorising.com/2017/08/thesis-for-silo-city-adaptive-re-use-design/	2017, "Artists and trades people can collaborate to create and showcase their work to the public. I believe this will bring great economic revenue to the City of Buffalo." "This thesis focuses on the renewal of Buffalo's cultural community. By capitalizing on the availability of federal grants from the Buffalo economic development plan, an adaptive reuse of Silo City will connect artists and entrepreneurs with a formerly urban rust belt community."
Philadelphia / USA	The Granary / ISA Architects	NOT BUILT Apartment, art-gallery, climbing wall, heat exchange labyrinth, rain water cistern	 	http://www.is-architects.com/the-granary	2010, "granary as cultural and environmental amenities, including climbing walls, heat exchange labyrinths, and art galleries. A 12-story, 100-apartment overbuild and new commercial uses at ground-level enable the development and serve to further activate the site"
Tasmania / Australia	Hobart Silo Apartments / ?	Residential, commercial		https://www.emporis.com/buildings/176376/silo-apartments-hobart-australia	2001

Chicago / USA	Adaptive Reuse: Repurposing Silos / Epstein	NOT BUILT Residential, hotel, public outdoor-stepped landscape and seating area		https://archello.com/project/adaptive-reuse-repurposing-silos https://www.epsteinglobal.com/projects/silo	2019, peel away some of its layers and expose its inner components, residential and hotel units would be constructed offsite and stacked into place within the existing silo
Deventer / Netherlands	Herbestemming Zwarte Silo Deventer / Wenink Holtkamp Architecten	Food market		https://thespaces.com/revamped-grain-silo-becomes-food-hub-netherlands-deventer-harbour/	
Newtown / Australia	Silos Apartment Project / Tonkin Zulaikha Greer Architects	residential		https://www.tzg.com.au/project/silos-apartments/	2005

Johannesburg / South Africa	Mill Junction / Citiq	Student accommodation study facilities, libraries, lounges and computer rooms	 	https://www.designboom.com/architecture/mill-junction-container-residences-overlook-johannesburg-02-10-2014/	2014
Auckland / New Zealand	North Wharf Promenade and Silo Park / Wraight and Associates	Promenade Climbing, showcase ??	 	https://www.world-architects.com/en/taylor-cullity-lethlean-carlton/project/auckland-waterfront-north-wharf-promenade-and-silo-park	2011
İzmir / Turkey	Alsancak TMO Siloları / Yaşar Üniversitesi Mimarlık Fakültesi İç Mimarlık ve Çevre Tasarımı Bölümü	STUDENT PROPOSAL Accommodation, workshop, office, public area		https://haber.yasar.edu.tr/genel/alsancak-silolarina-yasatan-tasarim.html	2016, "Ulaştırma Bakanlığı'nın Alsancak Kruvaziyer Liman Projesi kapsamında, TMO silolarının başka bir yere taşınarak bu alanda konaklama, alışveriş ve eğlence mekanlarından oluşan tesisler yapılması planlanıyor."

Eskişehir / Turkey	İbis Hotel	hotel		https://www.kulturportali.gov.tr/turkiye/eskisehir/NeredeKonaklanir/bis-otel	2006?
Polatlı /Turkey	Kent Konseyi Binası / Polatlı Municipality	City council		http://www.polatli.bel.tr//proje/kent-konseyi-binasi/42	2019
Buffalo / USA	Silo City / Multiple artists and students Mainly University of Buffalo	Architectural playground Student studies	 		"New uses are evolving organically and intuitively through the interest of local people, underpinned by a strong sense of shared custodianship. University of Buffalo students are regular visitors and are encouraged to think of this architectural playground as their own. The site is becoming a laboratory for the arts and industry, with cavernous spaces transformed through music and sculpture, urban sport and heritage tourism…23 million visitors to Niagara Falls each year can be encouraged the few miles along the river to Silo City."

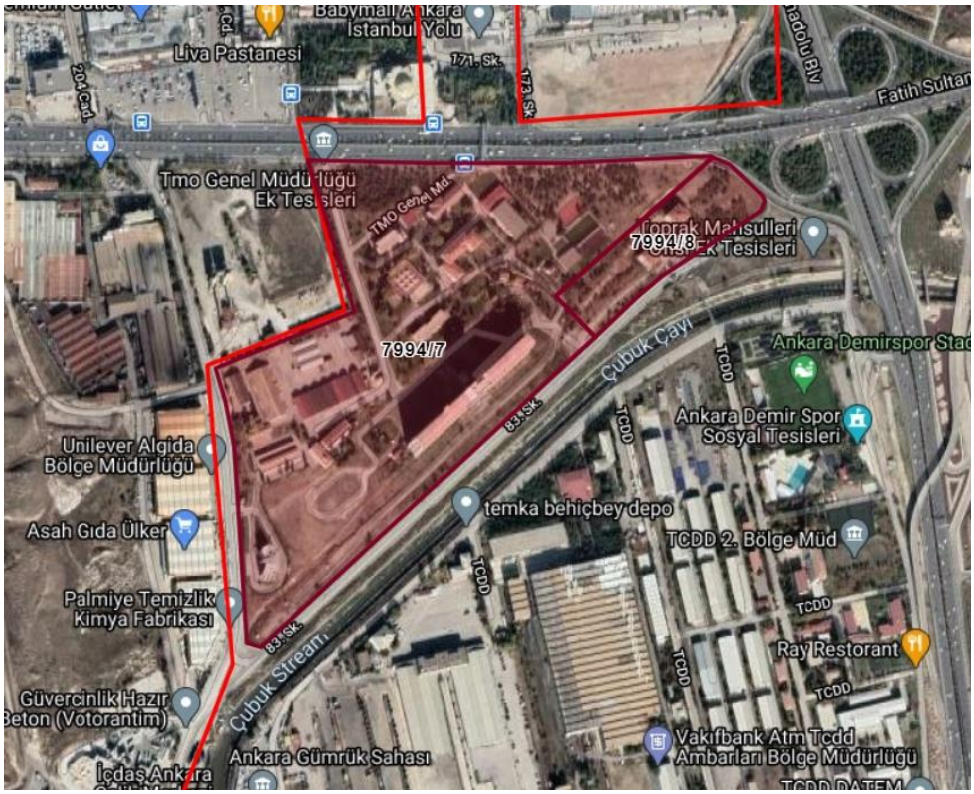
C. Parcel information from the General Directorate of Land Registry and Cadastre

Öznitelik Bilgisi	
Taşınmaz No	2927145
İl	Ankara
İlçe	Yenimahalle
Mahalle/Köy	Orman Çiftliği
Ada	7994
Parsel	7
Tapu Alanı	183.132,00
Nitelik	Tarla Ve Metruk Yol
Mevkii	Orman
Zemin Tip	Ana Taşınmaz
Pafta	-

Parcel information of the silo and the campus except for the apartment lodgements.

Öznitelik Bilgisi	
Taşınmaz No	2927146
İl	Ankara
İlçe	Yenimahalle
Mahalle/Köy	Orman Çiftliği
Ada	7994
Parsel	8
Tapu Alanı	21.764,00
Nitelik	Tarla Ve Metruk Yol
Mevkii	Orman
Zemin Tip	Ana Taşınmaz
Pafta	-

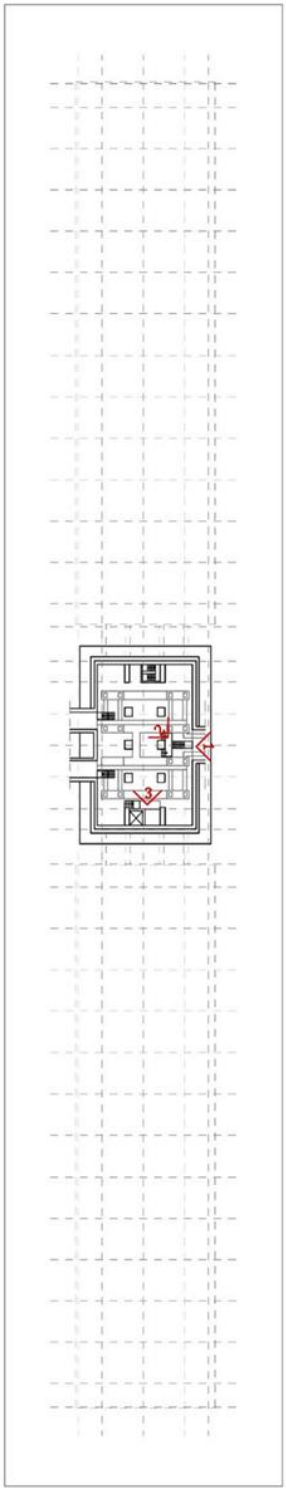
Parcel information of the apartment lodgements.



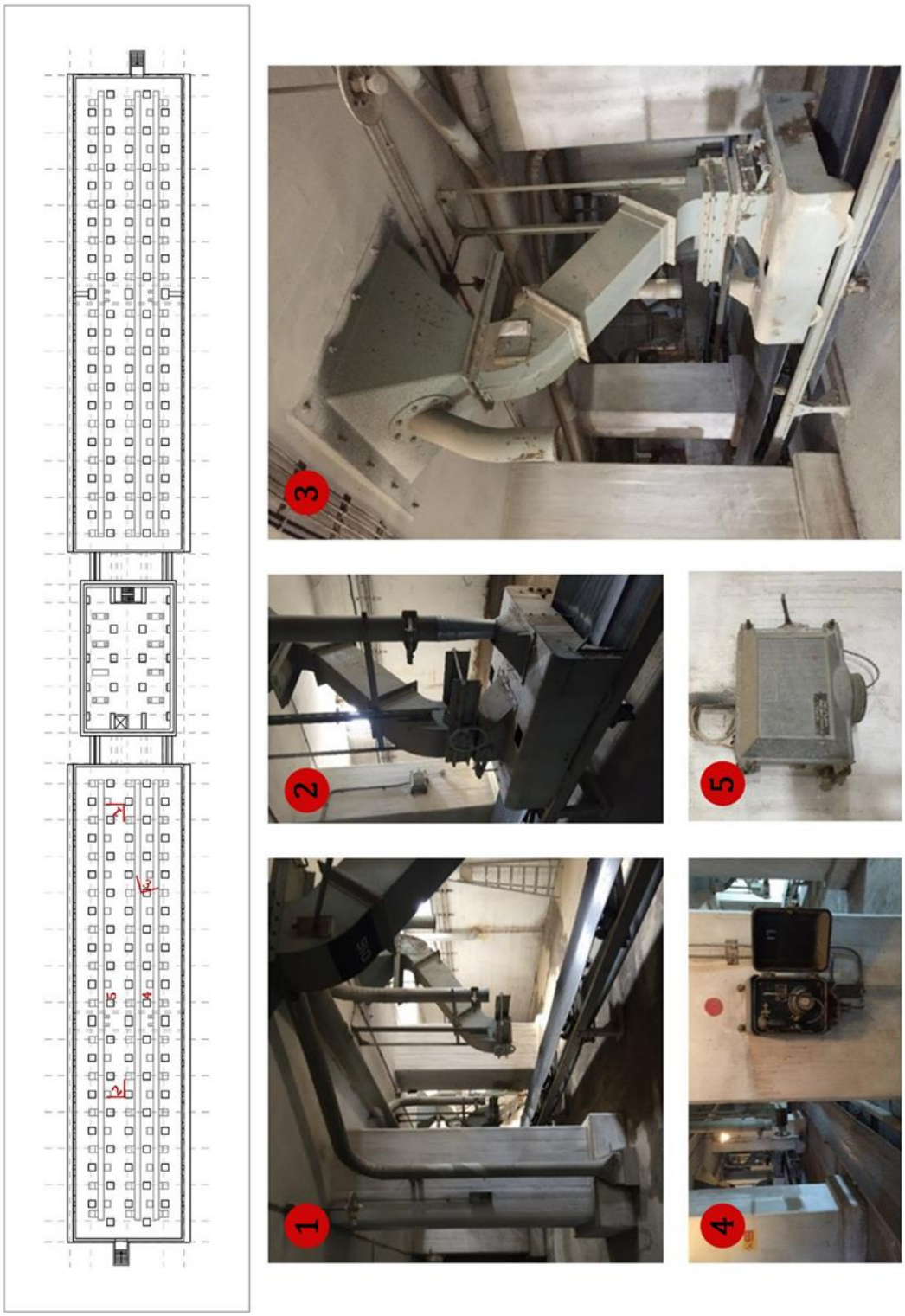
The positions of the parcels are on the map as drawn.

All images are retrieved from https://parselsorgu.tkgm.gov

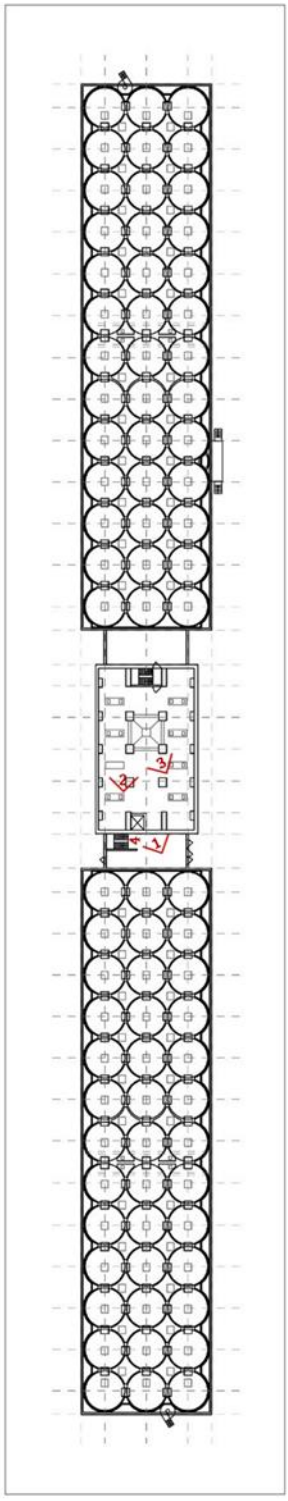
D. Plan Drawings of the Turkish Grain Board Ankara Güvercinlik Silo

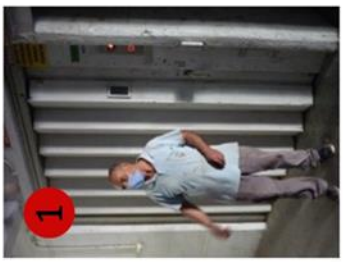


Elevator Pit Floor (-08.00 m)

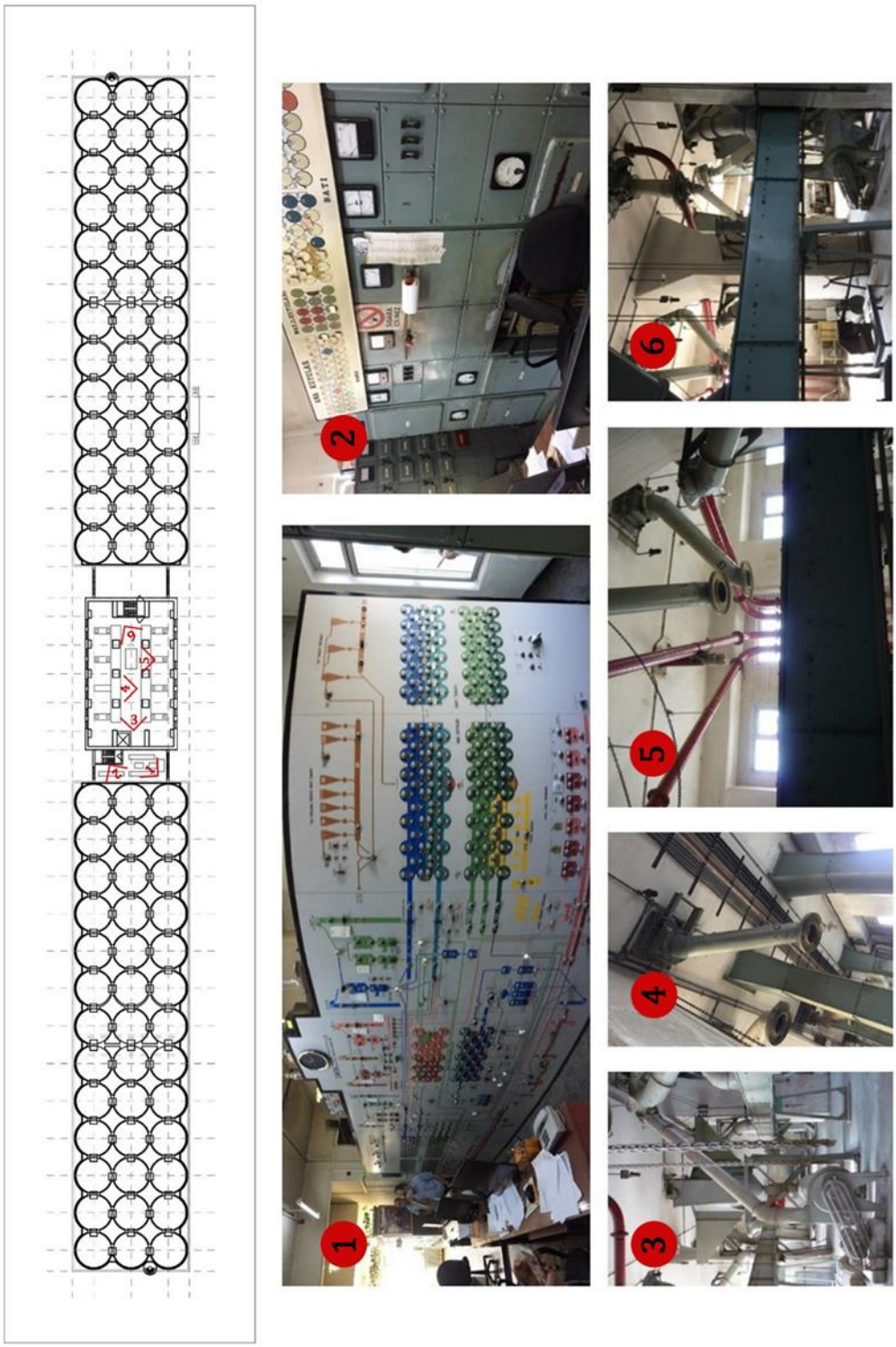


Lower Conveyor Floor (-02.10 m)

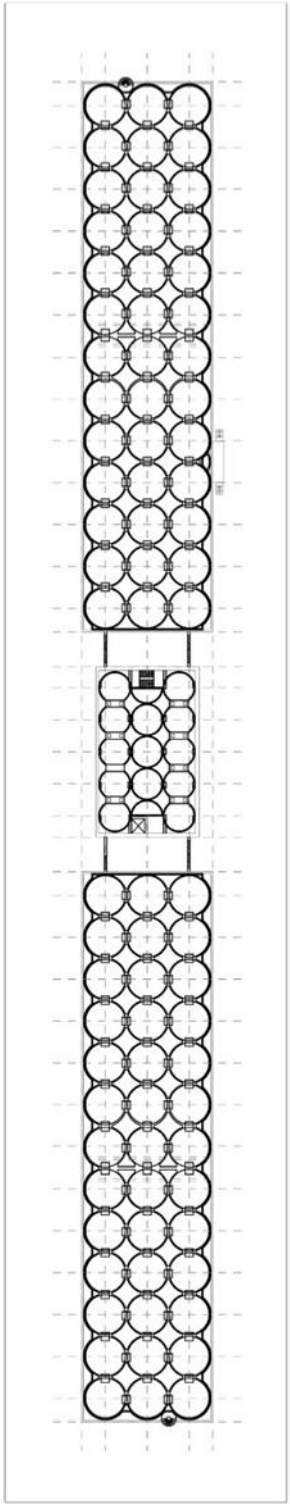




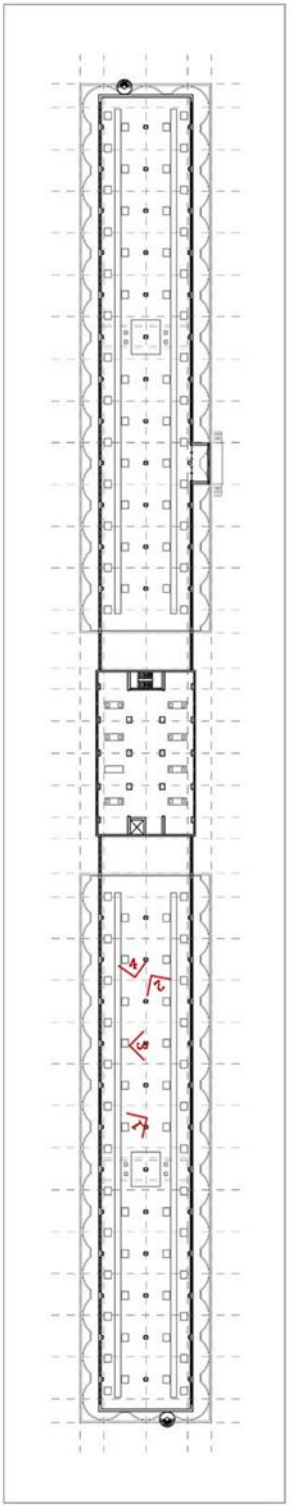
Entrance and Cleaner Floor (+00.90 m)

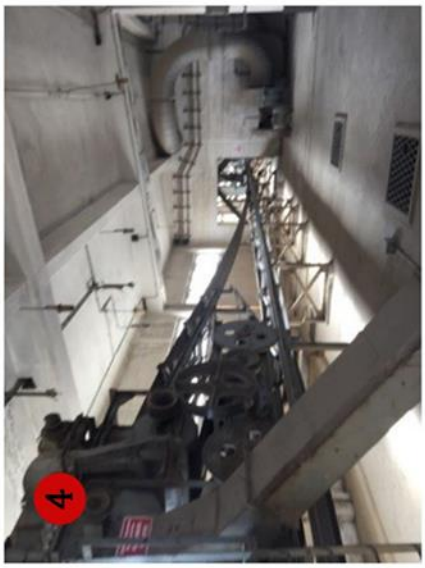


Intermediary Floor and Engine Room (+05.15 m)

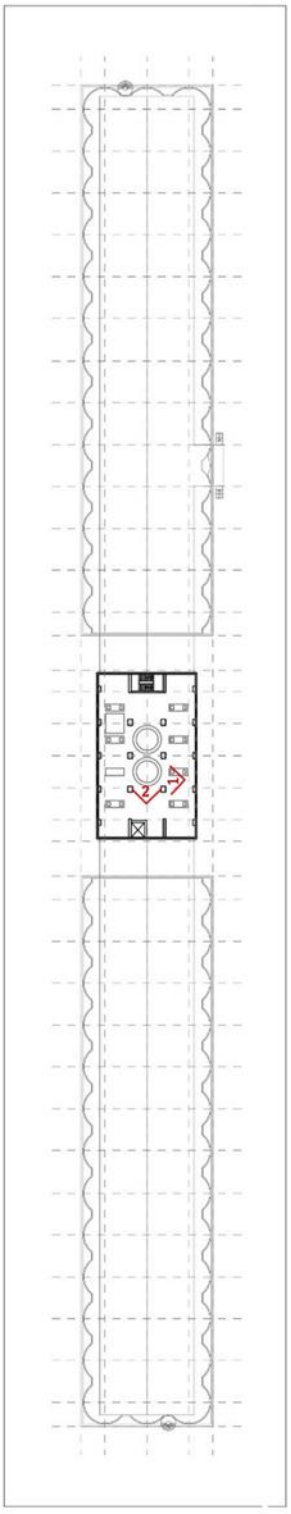


Storage Bins (+01.40 m from wings, +09.90 m from the central core)

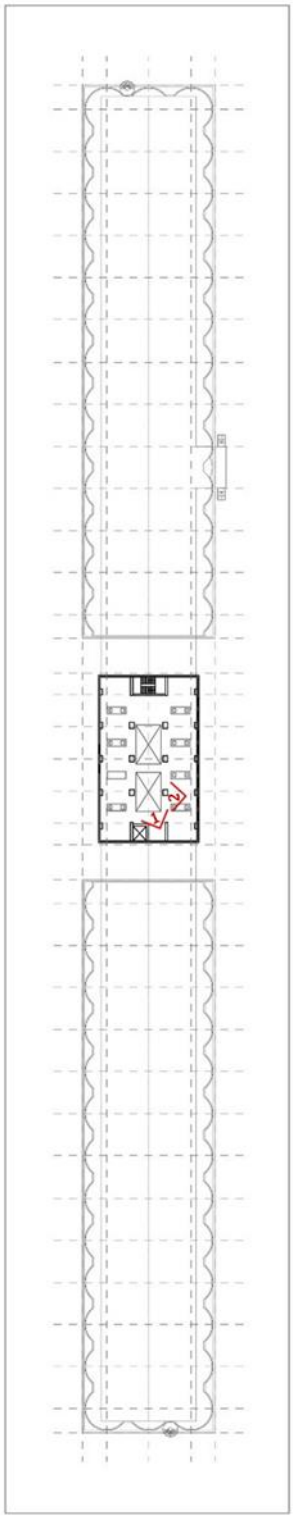




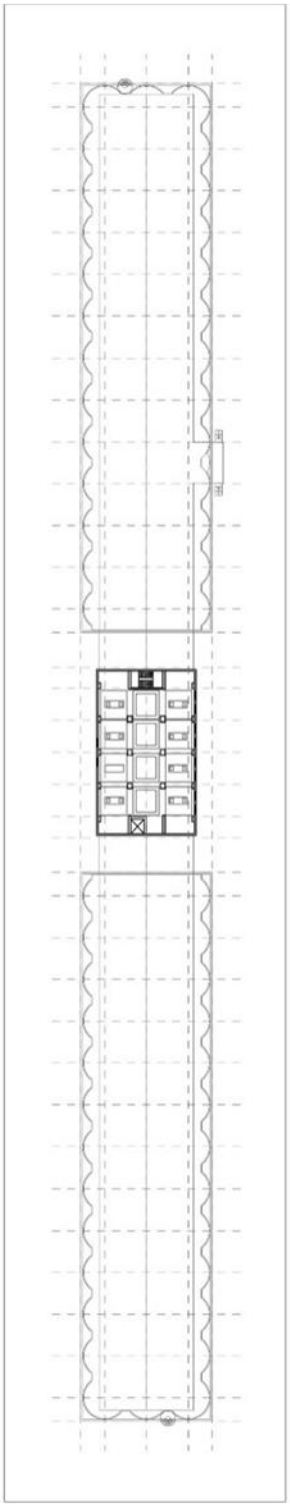
Upper Conveyor (+32.00 m)



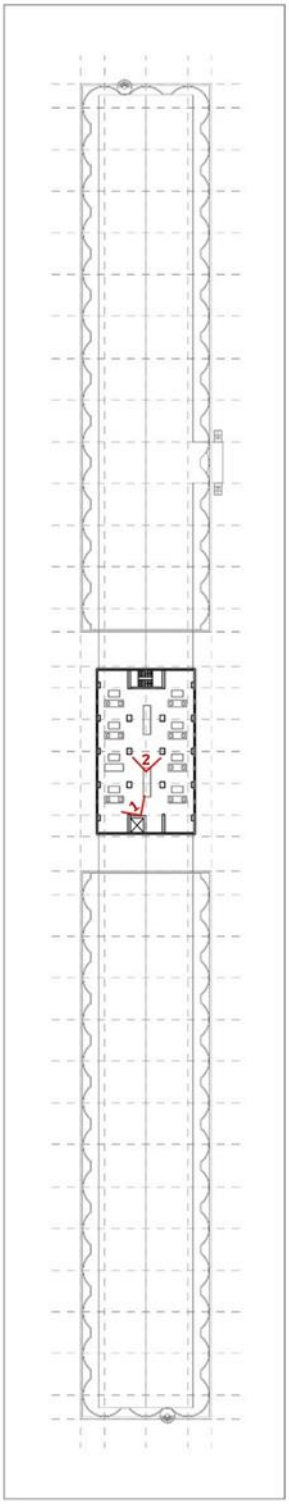
Distributer Floor (+37.50 m)



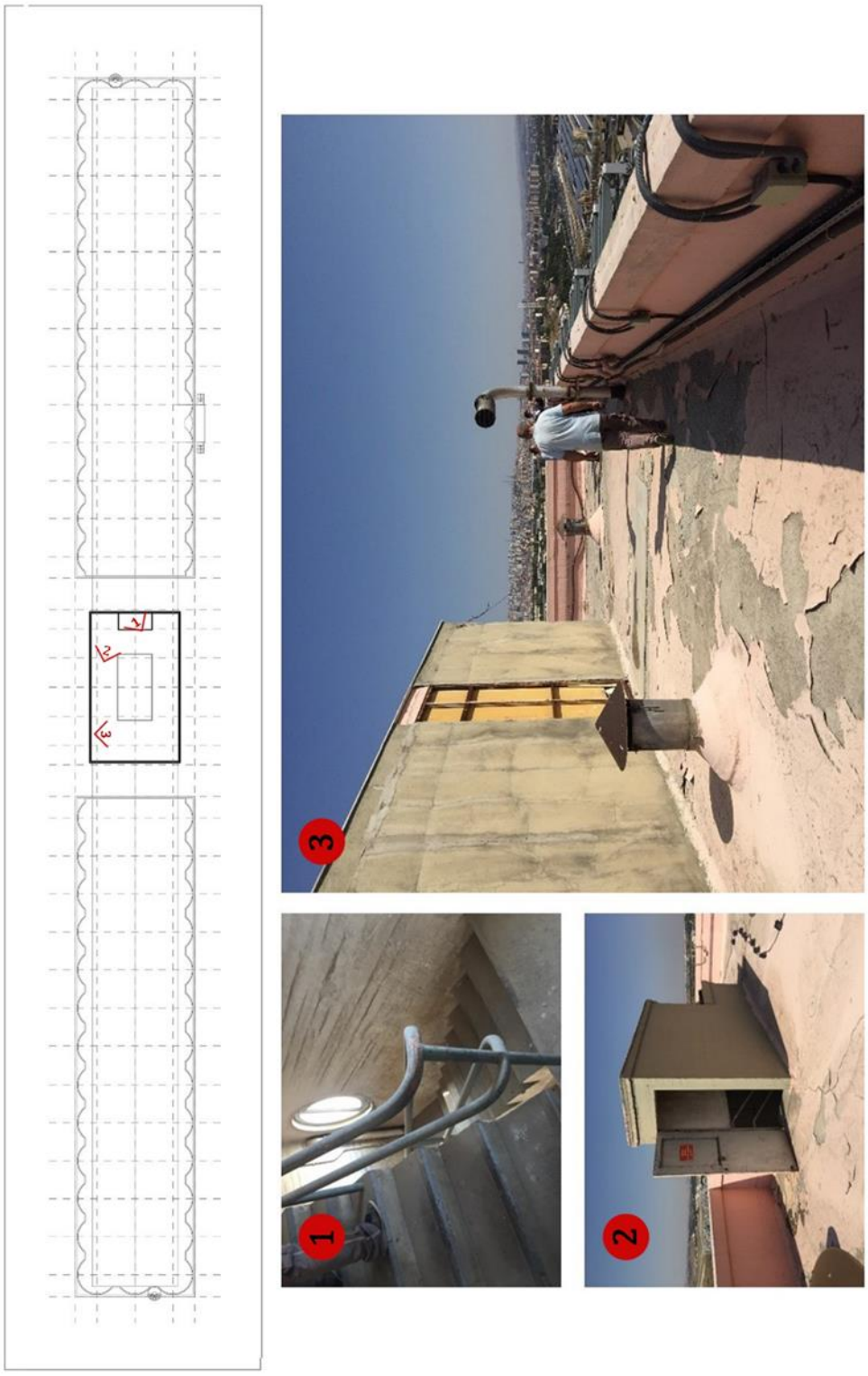
Weigher Floor (+42.25 m)



Garner Floor (+47.75 m)

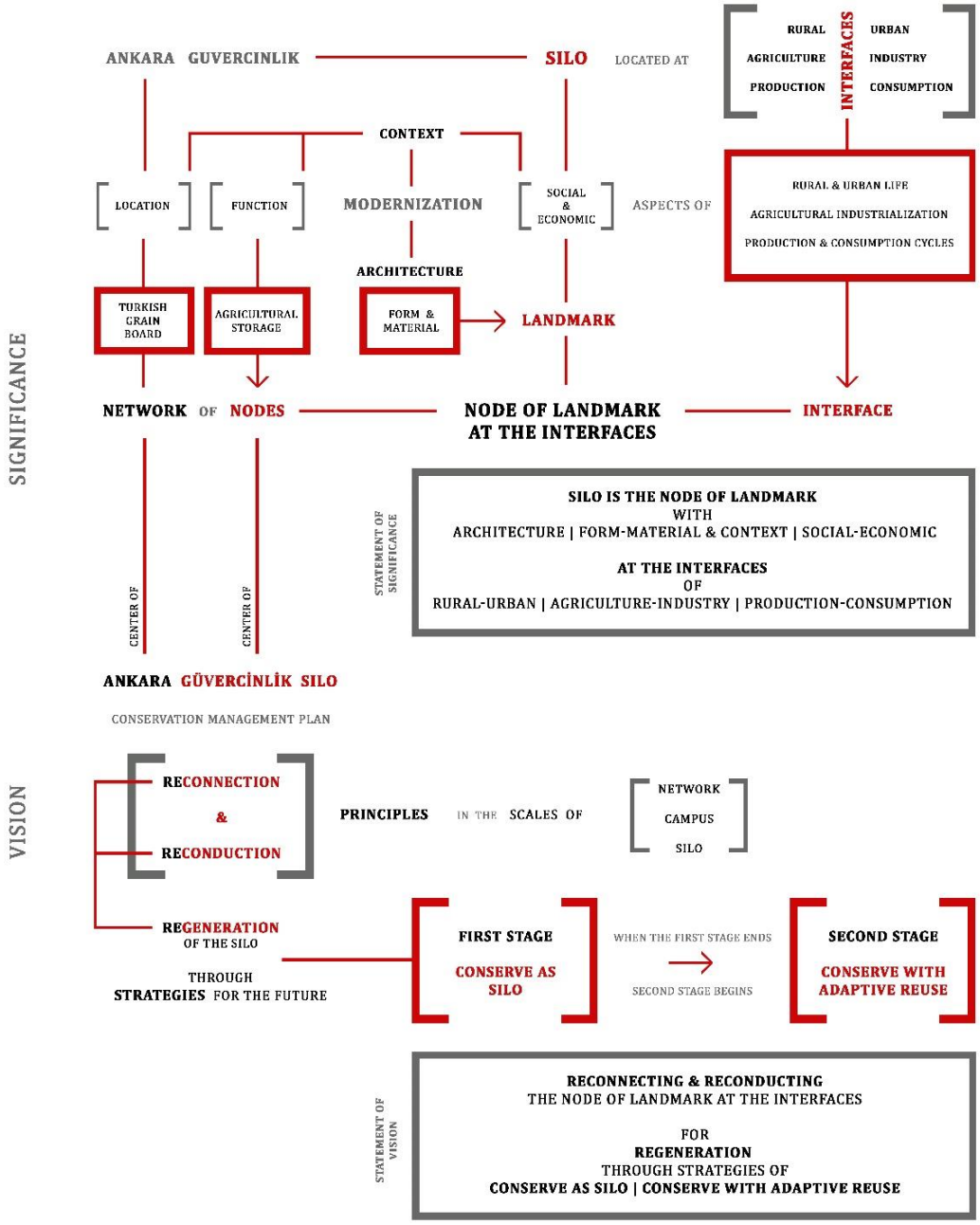


Elevator Head Floor (+54.75 m)

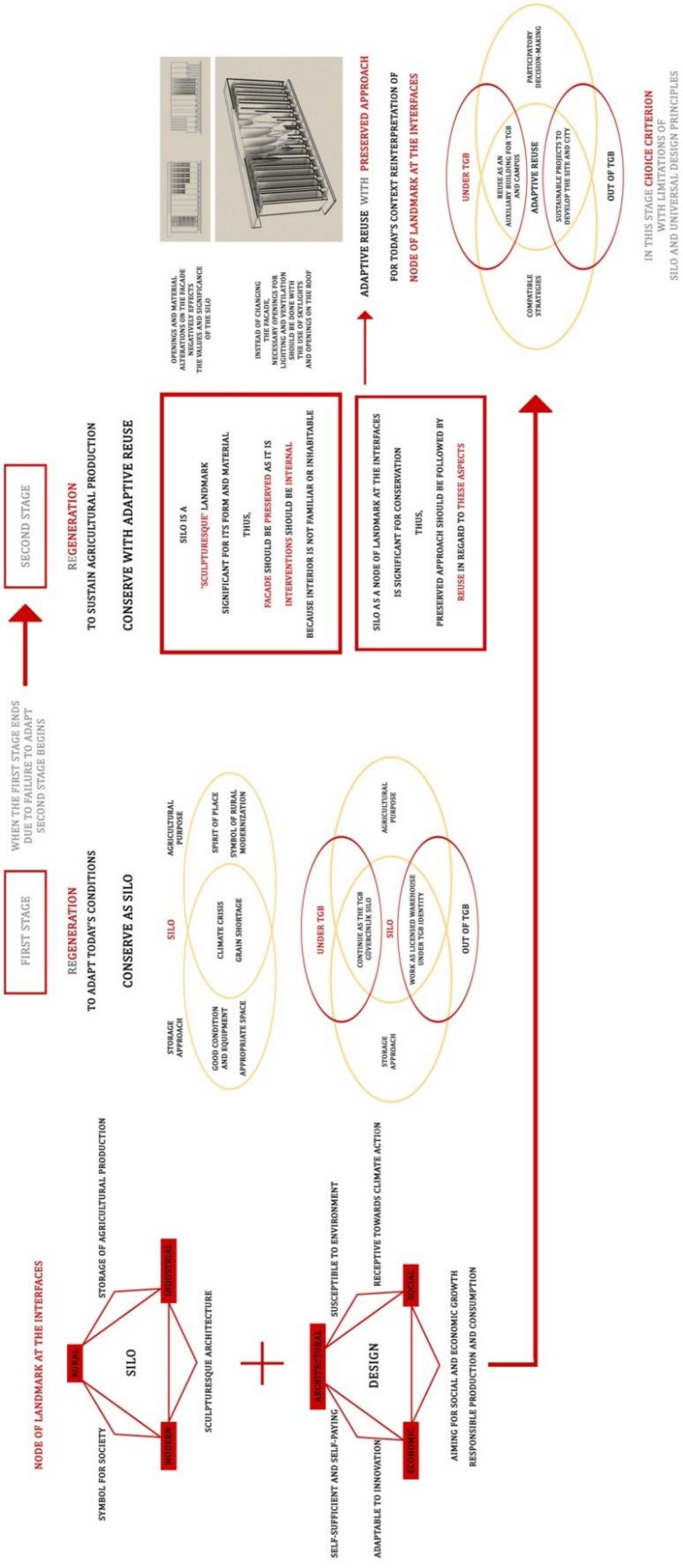


Terrace (+59.75 m)

E. Significance-Vision Map and Conservation Management Plan Action Schema for the Ankara Güvercinlik Silo



Author, 2021.



NODE OF LANDMARK AT THE INTERFACES
SYMBOL FOR SOCIETY
STORAGE OF AGRICULTURAL PRODUCTION
SCULPTURESQUE ARCHITECTURE
SILO
RURAL
INDUSTRIAL
MODERN
DESIGN
ARCHITECTURAL
SOCIAL
ECONOMIC
SELF-SUFFICIENT AND SELF-PAYING
ADAPTABLE TO INNOVATION
SUSCEPTIBLE TO ENVIRONMENT
RECEPTIVE TOWARDS CLIMATE ACTION
AIMING FOR SOCIAL AND ECONOMIC GROWTH
RESPONSIBLE PRODUCTION AND CONSUMPTION
FIRST STAGE
REGENERATION
TO ADAPT TODAY'S CONDITIONS
CONSERVE AS SILO
STORAGE APPROACH
GOOD CONDITION AND EQUIPMENT
APPROPRIATE SPACE
SILO
CLIMATE CRISIS
GRAIN SHORTAGE
AGRICULTURAL PURPOSE
SPIRIT OF PLACE
SYMBOL OF RURAL MODERNIZATION
UNDER TGB
CONTINUE AS THE TGB GÜVERCINLIK SILO
WORK AS LICENSED WAREHOUSE UNDER TGB IDENTITY
OUT OF TGB
WHEN THE FIRST STAGE ENDS DUE TO FAILURE TO ADAPT SECOND STAGE BEGINS
SECOND STAGE
REGENERATION
TO SUSTAIN AGRICULTURAL PRODUCTION
CONSERVE WITH ADAPTIVE REUSE
SILO IS A 'SCULPTURESQUE' LANDMARK
SIGNIFICANT FOR ITS FORM AND MATERIAL
THUS,
FACADE SHOULD BE PRESERVED AS IT IS
INTERVENTIONS SHOULD BE INTERNAL
BECAUSE INTERIOR IS NOT FAMILIAR OR INHABITABLE
SILO AS A NODE OF LANDMARK AT THE INTERFACES
IS SIGNIFICANT FOR CONSERVATION
THUS,
PRESERVED APPROACH SHOULD BE FOLLOWED BY
REUSE IN REGARD TO THESE ASPECTS
OPENINGS AND MATERIAL ALTERATIONS ON THE FACADE NEGATIVELY EFFECTS THE VALUES AND SIGNIFICANCE OF THE SILO
INSTEAD OF CHANGING THE FACADE, NECESSARY OPENINGS FOR LIGHTING AND VENTILATION SHOULD BE DONE WITH THE USE OF SKYLIGHTS AND OPENINGS ON THE ROOF
ADAPTIVE REUSE WITH PRESERVED APPROACH
FOR TODAY'S CONTEXT REINTERPRETATION OF
NODE OF LANDMARK AT THE INTERFACES
UNDER TGB
REUSE AS AN AUXILIARY BUILDING FOR TGB AND CAMPUS
ADAPTIVE REUSE
SUSTAINABLE PROJECTS TO DEVELOP THE SITE AND CITY
OUT OF TGB
COMPATIBLE STRATEGIES
PARTICIPATORY DECISION-MAKING
IN THIS STAGE CHOICE CRITERION
WITH LIMITATIONS OF
SILO AND UNIVERSAL DESIGN PRINCIPLES

Author, 2021.