

Exploration of relations between structural and spatial aspects of some early Republican buildings in Turkey

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ABSTRACT: During early Republican years (1923-1930) in Turkey, there was an anxiety for establishing a national style through implementation of domes, arches, eaves and tiled panels. The application of the pseudo dome as an attempt to follow old Turkish forms, was an extreme case showing the formalist attitude of the age. Early Republican architecture was developed within the conceptual frame of European Revivalist trends. The organization of the plan in accordance with the functional requirements was always considered after the elevations. Consequently, structural designs were not always compatible with their spaces due to the lack of experience with newly imported building technologies. Still, there is a necessity of detailed research before formulating rigid conclusions. This study discussing space-structure relations of early Republican buildings in a selected location fulfils such a necessity. The evaluation of the examples on Mimar Kemalettin Street in Izmir, Turkey will be presented within this frame.

1 INTRODUCTION

The aim of this paper is to analyse the structural and spatial characteristics of some early Republican buildings and to point out the deficiencies in their interrelations. The discussion will be carried out on the basis of a set of buildings located on Mimar Kemalettin Street in Izmir. This street is a transition zone between the so far preserved historical commercial center and the districts renewed during the early republican years.

Within this frame, in the next section, the historical evolution of structure-space relations will be summarized. Then, the factors that affect the relationship between structural systems and space organizations will be stated. Finally, the development of reinforced concrete building technology will be underlined since it is the construction system of the studied examples. In section three, changes in the social life and technology at the fall of the Ottoman Empire and the dawn of the Turkish Republic will be summarized. Then, the formal language of the era will be discussed. In sections four and five, evolution of the built environment in Izmir and on Mimar Kemalettin Street will be summarized. As a result, the urban pattern of the study area will be introduced. In section six, the design characteristics of different periods on the street will be compared. Finally, in sections seven and eight, early Republican buildings subjected to study will be described and analyzed in detail. The conclusive remarks will involve the criticism of the examples from point of view of the structure-space relations.

2 RELATIONS OF STRUCTURAL AND SPATIAL DESIGNS

The close relationship between structure and space has an evolutionary pattern. While the evolution of structural systems can be traced as a transition from load bearing to skeletal systems, the concept of space has evolved towards openness and transparency. The relation

between structural systems and spatial organizations may be classified into three historical groups: The first group covers the architecture of Egypt and Greece. Here, the interior space was not given importance. Therefore, there was no close relationship between the structural system and the spatial organization. The second group involves the developments starting with the Roman period. During this era, the impacts of structural design on the organization of interior space were considered. The role of structure was enclosing and covering space, and carrying loads. The construction of arches and domes depended on the presence of massive elements of enclosure. Therefore, the sense of weight was part of the experience of classical space. The third group involves the developments that took place at the beginning of the twentieth century. In modern architecture, the link between size and weight has been broken. In contrast to Classical architecture, Modern architecture lets large scaled, but light buildings possible. Space has become boundless in every direction since it no more depends on its enclosing elements.

The changes in social life and technology are the primary factors that affect the relationship between structural systems and space organization. New technologies have provided potential for the evolution of structural systems. In parallel with these technological changes, ideas about new forms have developed. Structural design is a synthesis of technique, material and form. It is an end product of an innovative design process, which is an integral component of the whole architectural design process. Development of architectural styles also has close connections with the developments in building technologies (Gideon, 1963; Korkmaz, 1998). It is known that the concept of style (design trend, character, manner) indicates an authentic design manner of a certain period of art, kind of art or artist (Hasol, 1988). Consequently, Norberg-Schulz (1988) uses the word 'style' in order to designate a characteristic formal organization. The concept of style covers all the elements, relations and structures, which form a meaningful system, with the qualification that they appear with a varying degree of probability. Thus, the formation of types is closely connected with the more probable aspects of the style.

It is known that reinforced concrete came into widespread use around the world in the early 20th century. However, it took some time for the use of this construction material with a clear recognition of its properties. The buildings that openly presented reinforced concrete skeleton as a building component instead of disguising them were identified as significant structures in the history of architecture. They were symbols of correct employment of the new material as a medium for architectonic expression (Gideon, 1963).

3 TURKISH REVIVALIST ARCHITECTURE

The years between 1909 and 1930 witnessed the struggles of some Turkish architects who opposed the western influences on Classical Ottoman architecture for the past hundred years. This struggle to attain a national style in Ottoman architecture proved to be a futile effort in the young Republic, who meant to cut all its ties with the Ottoman past on its road to progress and modernization. Hence, a few years after the establishment of the new state, the International Style became popular. It may be stated that the national Turkish architecture came as a reaction to Western Revivalism. It was longing for the glorious Ottoman architecture of the classical period. Therefore, a different type of revivalism was created.

This style made use of reinforced concrete building technology, but, unfortunately, the buildings were not of true skeleton type. The outer walls were not reduced to functioning simply as curtains. The set of monumental architectural elements selected for the design of the elevations in Turkish Revivalist buildings and the principles considered while bringing them together had characteristics specific to the country. The elements above mentioned were borrowed from Classical Ottoman architecture. They were namely various types of arches, ornate cornices, carved stone railings, wide eaves and polychromatic tiles. The methods of facade organizations were Western rooted, despite all the Classical Ottoman elements. The architecture of this period presented striking resemblance of European Revivalism. Western type of education the Turkish architects received during these years played an important role in this formation. As a result, in spite of its reactionary attitude to the West, Turkish Revivalist architecture turned out to be an almost exact copy of contemporary European architecture, re-

dressed in Classical Ottoman attires (Aslanoglu, 1980; Yavuz, 1981; Yavuz and Özkan, 1984, Sözen, 1996).



Figure 1: Map of the city of Izmir in 19th century (Georgiades, 1885; Tanyeli, 1992).

4 EVOLUTION OF THE BUILT ENVIRONMENT IN IZMIR

The city of Izmir has been one of the most secure harbours of Anatolia since the Antique period. It was settled around Izmir bay in 3000 BC. (Canpolat, 1953; Atay, 1978, Atay, 1993). It became a foreign trade center in the last quarter of the 17th century. As a result of the shift in the hierarchy of harbours, immigrations from Sakiz (Khios) to Izmir accelerated. In the 18th century, the remains of the Antique and Christian Ages were demolished in accordance with the increasing population and its demands for new constructions. The advantageous situation of Izmir continued during the 19th century. It became the most important commerce center and storehouse of east Mediterranean instead of Venetian and Genoese (Arel, 1998). It had a totally exterior oriented structure. Long distance commerce had left its place to the marketing of agricultural products of Izmir region. They were exported to Europe to feed the recently developing industrialized population. Nevertheless, technological developments in the city had a dual structure so that the old systems were continued together with the new ones. Stores marketing goods for the surrounding of Izmir were still present, but they were dealing with the sale of imported goods, too (Bilget, 1949; Kiray, 1972).

The evolution of the built environment in Izmir presented a special character in parallel with the tendencies of discovering West influential in Ottoman culture during 18th and 19th centuries. This was a process of deciphering the techniques and forms of Western art via examples in search of another identity in Izmir. Technical, governmental and commercial buildings reflected the contemporary tastes. They were all in Neo-Classical style. On the other hand, a break off from the Classical Ottoman architectural tradition leading to the loss of formerly present consistency and unity was achieved (Arel, 1998; Tanyeli, 1992).

In the early 20th century, further specifications took place in the functional choices. Izmir was the centre of retail-whole sale trade activities in the region. This included gathering and distribution of goods, banking businesses, technical and governmental services and industrial activities. Izmir was coordinating all these functions at international level. During this period, storage type of khans was constructed behind the harbour. They were end products of a different type of commercial life (Kiray, 1972). They were designed considering functional necessities and disregarding any anxiety for eye-catching. The area between Konak and Pasaport possessed a Western outlook. The dimensions of the buildings were enlarged as accessed to the sea coast and Neo-classical style was frequently observed. Large storage type of buildings was erected. During the sovereignty of Union and Progress Party between 1908 and 1918, Izmir was prepared for the later early Republican era through the establishment of a significant amount of public works (Martal, 1992). Starting with this period, the Neo-Classical style was interpreted so that the architectural elements borrowed from the past were no more Western origin, but Ottoman one. At the end of the Independence War in 1922, the area at the north of the historical commercial center had destructed by the fire. During the Modernization of Izmir, developments in the field of city planning have been more significant

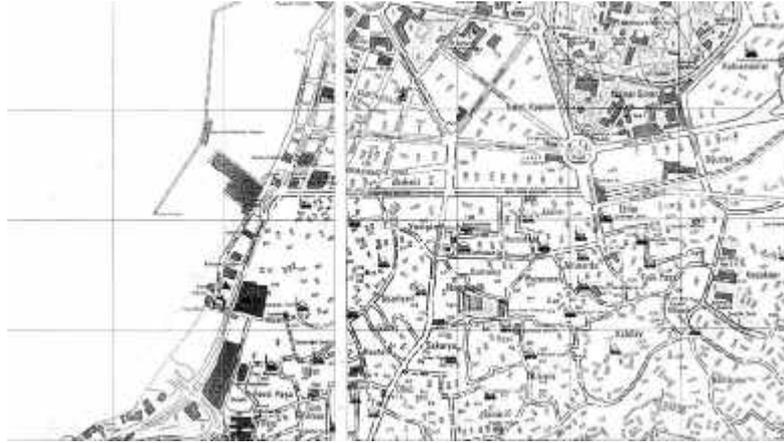


Figure 2 : Close vicinity of Mimar Kemalettin Street (Izmir Municipality, 1981).

compared to those in the field of architecture. The plan prepared for the improvement of Izmir in 1924 by Danger and Prost was the first totalitarian planning experience of the Republican period (Bilsel, 1996). Early Republican monumental buildings in Neo-Ottoman style contributed to the establishment of a physical environment in accordance with the scope of French city planning (Kuban, 1972). Starting on 1930s, buildings designed with modernist approaches have been experienced in the city (Tanyeli, 1992).

By 1970s, Izmir had enlarged in an enormous amount compared to the whole of its evolution through out history. Although the historical commercial center continued to function as the center of the business life, industrial activities were distributed to the whole metropolitan area. The concrete desire to sustain some of the commercial functions in the traditional locations, resulted in unhealthy urban organizations. The evolution of the built environment following these years, unfortunately, is mostly recalled with its negative impacts resulting in the loss of its so far established identity and lack of formation of any new one in Izmir (Kiray, 1972; Kuban, 1972).

5 EVOLUTION OF THE BUILT FORM ON MIMAR KEMALETTIN STREET

As explained in the above, Izmir has always been a harbour city through out its history. Being a harbour city has maintained a dense commercial activity in every period. The area known as Mimar Kemalettin Street at present has been part of the commercial network since Ottoman period. As observed in the majority of the commercial quarters of the Turkish settlements, an independent district at the center of Izmir was formed. It was composed of various commercial buildings such as khans and shops, and some other public buildings. The oldest documents in hand that have been effective in deciphering the historical plan layout of this commercial area belong to Ottoman period. Like many other typical urban spatial layouts of the time, the commercial buildings were orderly arranged to form a network of pedestrian shopping streets and centers in Izmir. This network included a zoning system of a variety of specialized markets. The historical route, Osmaniye Street, passing through the area of the study was a main artery connecting one of the city entrances to the commercial center.

There are a few shop buildings presenting the architectural characteristics of Classical Ottoman period on the street today. Their intimate scales are typical for the era. During the next Westernization period, the urban space subjected to study faced some minor alterations as a result of the new design trend evolving. The buildings increased in height as a result of European Revivalism that was popular, while they were designed. However, the form of the street was not transformed yet. When the remaining building stock of the period is examined, it is seen that the shop buildings are dominating in number, but there are also a few khans. Two of them are storage type of khans, which are commercial building types specific to this era.

The study area is included within the zone of fire dated 1922. The eastern part of the area has partially escaped from the fire, but the Western part was burnt at a great extent. The present MK



Figure 3 : Map of Mimar Kemalettin Street (Hamamcioglu, 2000).

Street was erected in the early Republican years according to the plan of Danger and Prost, dated 1924. The old Osmaniye Street had an organic pattern, but this street was planned according to the geometric principles. The effect of 1924 plan on the third dimension of the area is the erection of early Republican buildings. These are monumental structures in Neo-Ottoman style.

The effects of the rapid organization starting with 1970s have been the erection of multi-storeyed buildings, the demolition of historical buildings and construction of huge building masses on the street. These contemporary examples are designed with the anxiety of Modernism and Post-Modernism (Hamamcioglu, 2000).

6 COMPARISSON OF DESIGN CHARACTERISTICS OF DIFFERENT PERIODS ON THE STREET

An overall evaluation of buildings on the studied street points out some similarities, modifications and differences between them. These similarities may be summarized as follows: All of them function for textile trade today. Shop buildings and khans are the two primary building types in all periods. The principle of situating the maximum number of buildings along the street axis has resulted in a contiguous mass order with each building facing the street via its narrow facade. Rectangular formed spaces each organized around an axis with linear circulation schemes are the spatial theme of ground floors. Adjacency is the most prevalent type of relation between building spaces at this level. Again at ground levels, large sized openings are provided to establish strong relations between the customer on the street and the marketed goods inside the buildings.

On the other hand, there have been modifications in the interpretation of the commercial function within time. Sizes of both shops and khans have increased in time to provide larger commercial areas and to accommodate more number of units. This has brought the distribution of buying and selling functions to all levels instead of the ground level only, starting with early Republican era. It is also recognized that there is a decrease in the number of shops built on their own and increase in the number of khans from historical periods to contemporaries.

Apart from these slight modifications, sharper differences have occurred as a result of various other factors. It is certain that the evolution of building technologies has given the way to the construction of structural systems with contradicting characters on the street just like in some other places. Masonry system of Classical Ottoman designs were followed by combined ones composed of both skeleton and masonry elements in Westernisation period. Then, there comes the full skeleton with reinforced concrete starting with early republican buildings. There is also a rapid variation in the in filling and covering materials. Briefly, getting acquainted with each construction system and material has taken up time, and only after a period of experience, structural elements have started to become integral parts of their buildings. Higher structures,



Figure 4 : View of the east half of the street.

larger spanning distances and greater openings are opportunities provided in contemporary skeleton constructions of Mimar Kemalettin buildings like those in some other place.

Besides the technological reasons, the preferences of formal languages have played role in differentiation. The differentiation of design characteristics from 17th century until today is as follows:

- The scaling of the buildings as elements of the street has varied from intimate to imposing in time.
- The balance between the common and cellular spaces established in Ottoman khans was lost in the early Republican period in which the Classical courtyard and porticoes were replaced with a series of halls rather small in size, and lacking an interlocking type of relationship between one another.
- The design of ground floors at the same level with the street in Classical Ottoman and contemporary periods may be taken as a functional requirement. Elevated ground floors in Westernization and early Republican periods are reflections of Revivalism in search of monumentality.
- Pure organisation of entrances in Classical Ottoman and Modern buildings recall functionalist rationalism. During the Revivalist trends of Westernisation and early Republican years, various embellishment intending to produce Western and Turkish outlooks were preferred, respectively (Hamamcioglu, 2000).

7 DESIGN CHARACTERISTICS OF EARLY REPUBLICAN BUILDINGS ON THE STREET

There are nineteen early Republican buildings on Mimar Kemalettin Street. The ground floor areas are no more than 300 m². The building heights are between nine and eighteen meters. They present the majority of the design characteristics established in the country during that period. These may be listed as follows: The continuation of the elevated ground floors and increased floor heights observed in the previous Westernization era so as to achieve a monumental scale, utilizing the principle of axis, establishing the entrances as their terminating points, window formations in line with Turkish Revivalist tendencies, symmetrical arrangement of facades and embellished main entrances strengthening the access to the building, deficiencies in the relations of spatial and structural aspects.

On the other hand, some design characteristics are specific to the early Republican buildings on Mimar Kemalettin Street. Although symmetrical plan organizations are common for the period in other parts of the country, they are rarely observed on the street. This may be explained with lot forms in some cases, but the primary reason should be different. It may be claimed that the most prevalent type of spatial relation has been adjacency for shop series on ground floors in all periods on MK Street. Therefore, the main entrance of the khan providing

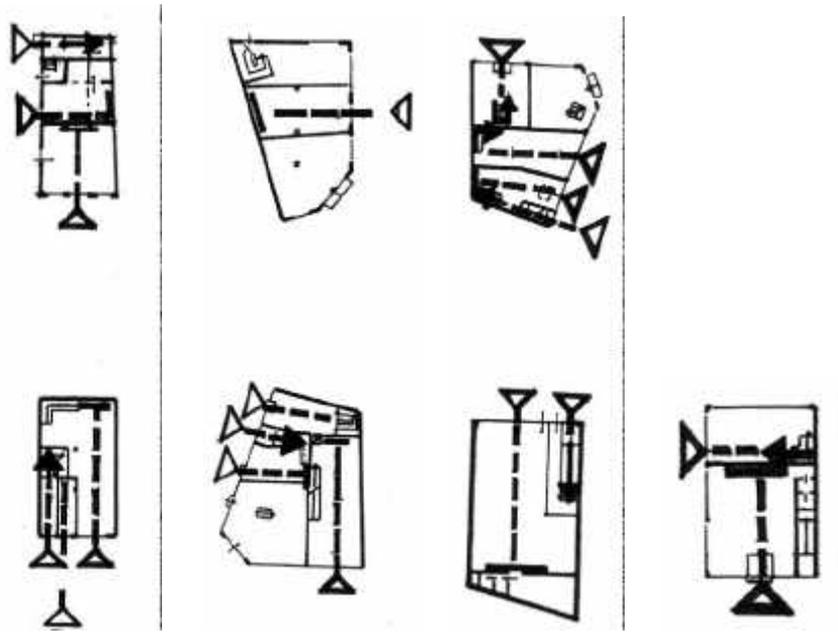


Figure 5 : Asymmetric plan organizations.

access to the upper floors could not be a terminating point of the axis of symmetry; rather it was not a secondary position facing the side or rear streets.

The organization of these early Republican buildings may be best understood, when ground and upper levels are taken up separately. This statement points out the loss of balance between the common and cellular spaces established in Ottoman khans. The classical courtyard and porticoes were replaced with a series of halls rather small in size and lacking an interlocking type of relationship between one another.

On ground levels, an axial main space with entrances terminating at one end, and stairways, walls or secondary entrances at the other is seen. This axial order is continued at upper levels, when small rectangular lots are considered. In larger plots, which make up the majority, a common space around which others are organized has been developed. When the plot reaches an enormous size, the common space has a skylight (Hamamcioglu, 2000).

8 CONSTRUCTION TECHNIQUES AND MATERIAL OF EARLY REPUBLICAN BUILDINGS ON THE STREET

They are constructed as skeleton structures with reinforced concrete, but they were concealed from exposure with the anxiety of strengthening the Classical Ottoman architectural elements. These new structural designs appeared as complex and awkward products. The axial system of skeletons has an indefinite order. Close distances between axis, obtuse and acute angled axis, lack of columns at beam intersections, intersection of three or more beams at a single point, etc. are frequently observed. Haunched beams are thick and columns are fat, compared to the element sizes suggested for the same spanning distances in building technologies of today.

The traditional building technologies continued to be used for filling and covering purposes. This meant brick and stone walls put together with mortar in random order. The walls are finished with plastering and painted in various colors. Finishing of exterior walls are distinguished from the interiors with the ornamentation work applied on the plastering. This embellishment concentrates around windows and doors, and on balcony and basement walls. Tiles are sometimes introduced to the composition.

Roofs are hipped and covered with Marseillaise tiles. Domes with timber constructions and covering are observed at corner buildings as decorative structures independent of the spatial layout beneath them. These pseudo domes together with small sizes of plan layouts underneath them are the best features presenting the formalist monumentalism of the era. Since they are not



Figure 6 : Interior view of the reinforced concrete skeleton system.



Figure 7: Pseudo-dome of one of the early Republican buildings on the street.

observed from the interior, it is not possible to discuss any relation between the superstructures and related spaces. The organization of the plan in accordance with the functional requirements was considered after the elevations. The roof system is generally hidden behind an ornamented parapet wall. Eaves in line with the ceiling of top floors are observed. In one case, there are eaves of iron construction and covered with glass, protecting shop-windows of ground floors.

Upper floor openings with arches, though not compatible with a skeleton frame structure, are utilised in the elevations so as to fulfil an intention of producing Turkish architecture. Their frames and wings are timber. The ground openings as wide as the front walls provide sufficient amount of light. Openings of ground floor shops are protected with roller sheet blinds. Ornamented iron columns supporting the roller sheet blinds, which were common in the preceding Westernisation period, continued to be used in the facade organisations. Khan entrances leading to the upper floors have iron joinery. Windows of upper levels have iron shutters. Stairs and balconies, constructed in skeleton system, possess iron or timber balustrades with timber hand railings. Floor covering is frequently square tiles with motifs on ground floors, balconies and halls. It is timber in the upper rooms. Stairs are covered with cast in-situ mosaic (Hamamcioglu, 2000).

9 CONCLUSIONS

The introduced early Republican buildings were permanent and essential part of the daily commercial life in Izmir, Turkey. They covered the whole commercial district that was renewed starting with 1923. Their erection represented the modernization of architecture in the city. However, the consistency in the relations of classical Ottoman structural and spatial designs was lost. Massive exterior walls maintained the sense of weight. The skeleton system was hidden within these heavy walls. The skeleton structure chosen for their construction was not a determining factor in their design. In these buildings, concrete made no architectonic use of the skeleton. The facades were used as support for embellishment. Their expression was derived from architectonic refinements of previous eras than from the new potentialities. Heavy masonry walls and rather small dimension of upper storey windows indicate the extent to which they limited their architects. The narrow concrete slabs projecting at the upper storey levels are for to provide the image of Turkish eaves, rather than to provide shade. Nevertheless, they represent the first employment of reinforced concrete in building technology in the country. The impressiveness of these commercial buildings were in line with Western Revivalism and indigenous simultaneously. An authentic transformation of Turkish architectural elements with Western methods of composition is achieved. The integration of ground floor with the street was made possible with the advantages of the skeleton structure and availability large sheets of glass.

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