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CONSTRUCTION MATERIALS AND TECHNOLOGIES IN THE FIRST NATIONAL ARCHITECTURE MOVEMENT: BRIDGING TRADITION AND MODERNITY

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1. Translation from Turkish to English by the author.

2. This movement was also named National Architecture, National Architecture Renaissance, National Architecture Style, and Neo-Classical Style during that period (Sözen, 1996, 13).

3. While there are numerous studies cataloging the period's buildings within different contexts, Aslanoğlu (1980), Çuha (1989), Yergün (2002), Uzun (2008), Yavuz (2009), and Karahan (2018) are comprehensive studies regarding this period's buildings, mentioning their construction systems.

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> "The novel architectural system (the result of the use of iron and cement) must bear the characteristics of the people and ambiance that creates it. That is, we must construct our buildings with modern materials and according to the necessities of the modern lifestyle rather than in old monumental styles but following the direction of our national character and staying committed to the structural and ornamental principles of Turkish architectural style." - Kemaleddin Bey, 1917 (Tanaçan and Ersoy, 2008, 80) (**1**)

INTRODUCTION

This study investigates both the building materials and the construction technologies used during the final years of the Ottoman Empire and the early years of the Republic of Türkiye, from the proclamation of the Second Constitution in 1908 to the end of the First National Architecture Movement in 1930–1931(**2**). This period, marked by the architectural style known as the First National Architecture Movement, is significant for reflecting the shifting political and cultural dynamics of a declining empire and a nascent republic. The architects of the period embraced modern construction materials and technologies—such as steel and reinforced concrete—introduced by industrialization, while simultaneously striving to create a national architectural identity rooted in traditional forms.

Despite the rich architectural expression of this period, scholarly literature has focused mainly on the aesthetic and stylistic aspects of the movement, often neglecting or superficially addressing its technical features. Most research on buildings of this period glosses over their construction techniques, but only a few studies give details and contradict one another in some cases (**3**). That said, a detailed examination of the technical aspects is essential, given that this period represents a transitional phase where traditional and modern materials and construction technologies were frequently used in tandem. From a conservation perspective, this scrutiny

is crucial to ensuring the preservation of the original fabric and material integrity of these buildings, in accordance with the International Charter for the Conservation and Restoration of Monuments and Sites (Venice Charter, 1964) and the ICOMOS Principles for the Analysis, Conservation, and Structural Restoration of Architectural Heritage (2003). Moreover, when evaluated within their historical and cultural context, the buildings from this period hold a value of authenticity. As emphasized by the Nara Document on Authenticity (1994), their unique features must be preserved and transmitted to future generations, for they represent the innovative synthesis of tradition and modernity that defines this architectural movement.

This research provides a comprehensive overview of the materials and technologies used in the First National Architecture Movement, contributing to scholarly understanding, architectural history, and heritage conservation. The study is based on a literature review and archival investigation of both textual and visual documents. In addition, personal observations were made on prominent buildings representing this style in Ankara and Istanbul **(4)**. The visited buildings cover a wide range of architectural functions and were designed by different architects, representing both the Ottoman Empire and the Republic of Türkiye across the two most significant cities. While these site observations provided valuable insights, it is important to note that the findings were limited. Consequently, the final evaluations of the buildings were based on a combination of findings from the literature and visual sources, and personal judgment. Focusing on specific cases was deliberately avoided to showcase and understand various construction techniques and materials of the period. Several inconsistencies in the literature regarding the materials and techniques claimed to have been used in these buildings were identified during this research. Therefore, this paper also seeks to address and clarify these discrepancies.

HISTORICAL CONTEXT OF THE FIRST NATIONAL ARCHITECTURE MOVEMENT

Ottoman architecture began to be influenced by European Neoclassical styles in the 19th century. After the closure of the Office of Royal Architects (*Hassa Mimarlar Ocağı*) and the establishment of the Directorate of Royal Buildings (*Ebniye-i Hassa Müdürlüğü*) in the early 19th century, a need arose for an architectural school to train qualified architects. However, such schools were only founded towards the end of the century (Turan, 1963). Due to the cultural dominance of France in Europe and the close relationships between the Ottoman Empire and France, the French educational system was adopted in the Ottoman Empire. Consequently, the School of Fine Arts (*Sanayi-i Nefise Mektebi*) was established in 1883, followed by the Civil Service School of Engineering (*Hendese-i Mülkiye*) in 1884 in Istanbul (Nalbantoğlu, 1989, 42-43, 53). Prominent European and Levantine architects, such as Alexandre Vallaury and August Jachmund, taught at these institutions **(5)**. Many influential architects of the First National Architecture Movement graduated from these schools (Nalbantoğlu, 1989). According to Tanju (1999, 36), the First National Architecture Movement is "the natural result of the 19th century's eclectic/historicist Ottoman architecture," as architectural education at the time followed an eclectic/historicist approach. This method involved selecting and combining elements from historical styles, particularly for exterior designs.

4. Site visits included the Grand Post Office (*Büyük Postane – Posta ve Telgraf Nezareti*), the 1st Waqf Han *(I. Vakıf Han)* and 4th Waqf Han (*IV. Vakıf Han)*, and the Imperial Offices of Land Registry (*Defter-i Hakanî*, now Hagia Sophia History and Experience Museum) in Istanbul. In Ankara, the Ankara Palace (now Ankara Palas Museum), the First and Second Parliament Buildings of the Republic of Türkiye (now Museum of the War of Independence and Museum of Republic, respectively), the General Directorates of İş Bank (now Museum of Economic Independence) and Ziraat Bank, the Head Office of Ottoman Bank (now Ulus Branch of Garanti Bank), the General Directorate of Monopoly (*İnhisarlar Baş Müdürlüğü*, now the Yunus Emre Institute), the Ethnography Museum, and the Turkish Society Building (*Türk Ocağı*, now the State Museum of Arts and Sculpture), Gazi and Latife Model Schools (*Numune Okulları*, now *Ulus İlk Meclis Anadolu İmam Hatip Lisesi* and *Ulus İlk Meclis İmam Hatip Ortaokulu*), and the Ministry of Finance (*Maliye Nezareti*, now the Rectorate of Social Sciences University of Ankara) were visited. A few buildings from Izmir and Istanbul were examined through photographs.

5. Vallaury was an instructor at the Royal School of Fine Arts (*Sanayi-i Nefise*). Jachmund was in charge of the architectural program after 1890 at the Civil Service School of Engineering (*Hendese-i Mülkiye*).

In the early 20th century, Turkish architects became more actively involved in architectural practice and began to influence architectural theory. Vedat Tek and Kemaleddin Bey, two of the movement's most prominent figures, were the first Turkish architects to receive academic architectural education **(6)**. One of the earliest and most significant examples of the First National Architecture Movement is the Imperial Offices of Land Registry (*Defter-i Hakanî*, now Hagia Sophia History and Experience Museum), completed by Vedat Tek in 1908 (Özkan, 1973, 49). As this style was embraced by both the Ottoman and Republican governments, many public and private buildings were constructed in this style throughout the country over the next decades (Bozdoğan, 2020, 33-77). These include administrative, religious, educational, commercial, and transportation buildings (ferry piers, railway stations, etc.), memorial statues, tombs, houses, hotels, and so forth.

Due to the eclectic/historicist nature of their education, the movement's architects drew inspiration from Classical Ottoman and Seljuk architecture. They incorporated these elements into new designs with a particular focus on façades and main entrances. Buildings were generally designed symmetrically, emphasizing the entrance set at the central axis, often inspired by Seljuk and Ottoman portals. Buildings on triangular lots typically had one rounded corner. The façades were adorned with columns featuring Turkish-style capitals (stalactite or diamond-shaped), floral and geometric carvings, and/or tiled panels. Typically, only the façades with the main entrance were heavily decorated, while the other façades remained simpler. Some buildings featured tower-like projections at the corners, and false domes were sometimes used above the towers or entrances. Various types of arches—primarily pointed and segmental, and occasionally Bursa-type arches—were used for windows and doors, often complemented by lintel courses. By incorporating these traditional elements, many buildings from this period retained the overall appearance of Classical Ottoman architecture.

While some modern architects and scholars have criticized the movement for being derivative and not fully utilizing the technological advancements of the time, the writings of Kemaleddin Bey show that he embraced contemporary technologies and the opportunities they offered (Tanaçan and Ersoy, 2008). These architects were fully aware of the necessities of modern life, which is evident in their designs that incorporated new functions, technologies, and facilities such as heating, electricity, and plumbing.

CONSTRUCTION MATERIALS AND TECHNOLOGIES OF THE PERIOD

The buildings of the First National Architecture Movement showcase a unique blend of traditional materials and technologies with modern innovations brought about by industrialization. During this period, locally sourced and imported materials like stone, brick, timber, and ceramic tiles, which were staples of traditional Ottoman architecture, were used alongside newly introduced materials such as steel, reinforced concrete, and cement-based products. These materials were chosen for their structural properties and symbolic significance, as architects sought to preserve the aesthetic of classical Ottoman architecture while embracing the technological advancements of the time. The integration of modern and traditional materials and technologies reflects the broader cultural and political transitions of the era, as the movement aimed to reconcile national

6. Vedat Tek studied at *Ecole National des Beaux Arts* in France (Özkan, 1973), and Kemaleddin Bey studied at *Berlin-Charlottenburg Technische Hochschule* after he graduated from *Hendese-i Mülkiye* (Yavuz, 1981a).

architecture with the demands of modernization. This section will examine the key construction materials and technologies of that period. It will highlight their role in shaping the architectural character of the movement and addressing the interplay between traditional craftsmanship and modern construction technologies.

Structural Systems and Materials

Due to the Westernization movement in the Ottoman Empire, the state organization was renewed, and local municipalities were established in the late 19th century. Construction regulations enacted by the municipalities promoted masonry structures over traditional timber ones as a fire precaution since conflagrations were frequently destroying large neighborhoods (Baturayoğlu Yöney, 2013; Çelik, 2019). Stone has long been an essential building material in traditional Ottoman architecture. However, by the late 19th century, the stone supply from Istanbul's quarries could no longer meet the growing demand. This became a critical issue for construction activities. Due to difficulties in sourcing sufficient quantities of stone locally, particularly for large-scale projects, other construction activities were impacted, leading to discussions about importing stone from abroad (Ekinci, 2019, 504). According to the *Annuaire Oriental* of 1881, various types of stone were imported from Belgium and Italy; however, it is uncertain whether these were used for structural or finishing purposes (Baturayoğlu Yöney, 2008, 101).

In addition to the economic and practical difficulties of sourcing stone, the demographic changes following World War I (1914-1918) and the Turkish War of Independence (1919-1923) exacerbated the issue. As observed by architect Arif Hikmet Koyunoğlu, many of the skilled stonemasons—primarily Armenian and Greek—were no longer available in the early Republican period (Birkan and Pehlivanlı, 1977, 10). Due to these challenges with both materials and labor, the stone masonry technique was used only to a limited extent in large-scale buildings. Yet, it was not completely abandoned: the most renowned example of this type of structure is the First Parliament of the Republic of Türkiye (built in 1920) in Ankara. Originally designed as the Committee of Union and Progress (*İttihat ve Terakki Cemiyeti*) building, it now serves as the Museum of the War of Independence (**Figure 1**) (**7**). Stone masonry with rubble stone was extensively used in residential buildings in the Yenişehir district of Ankara. It was usually alternated with brick masonry and standardized mass-production concrete building elements, such as jambs and lintels, and coated with plaster (Cengizkan, 2022, 43-44).

Owing to the scarcity of stone, brick became the most prominent and in-demand building material. Brick 'factories' were opened in Istanbul and Mürefte in the late 19th century, producing various kinds of bricks, but these were rather 'plants' using undeveloped production methods (Çiftçi and Yergün, 2010; Kaya, 2017; Erdal, 2023, 188-213). Local bricks lacked standardization, making them less competitive against imported ones. Although there was no standard size, they roughly measured 22x11x7 cm (Tok, 2015). Following the 1913 Law of Industrial Promotion (*Teşvik-i Sanayi Kanunu*), some brick factories were established around Istanbul. Yet all production was halted in 1917 due to World War I. Despite local production initiatives, brick production could only meet 32.1% of the demand, and the deficit had to be imported during the early years of the Second Constitutional Period (Ural, 1974, 17). According to an article in the *Revue Technique d'Orient* (1912), between 1908 and 1909, solid and

7. The Second Parliament of the Republic of Türkiye, now Museum of Republic in Ankara (built in 1924), was also cited in the literature as an example of stone masonry (Aslanoğlu, 1980). However, based on my personal observations, the building may be stone-clad. The walls in the balcony on the front façade and the corners of the front façade are plastered. On the other façades, the stones used in the corners are visible and relatively small. In typical masonry construction, larger, finely cut, and more durable stones are placed in the corners to enhance the structural stability of the walls (quoining). Additionally, brick pilasters are visible in the basement, further suggesting that the structure is more likely to be brick masonry.

Figure 1. Ankara, The First Parliament of the Republic of Türkiye (Photograph: Selin Sur, 2021**)**

perforated bricks were mainly imported from France, Italy, England, Greece, Germany, Belgium, and several other countries, while refractory bricks were primarily sourced from England, France, Germany, and Belgium. Imported three-hole bricks measured 21.5x10.5x4.5 cm, while six-hole bricks measured 21.5x10.5x6.5 cm (Tok, 2015).

Architect Arif Hikmet Koyunoğlu, in an interview, mentioned that there was only one small production center for 2 cm thick handmade bricks in the early 1920s in Ankara, compelling him to open and run three brickyards himself (Birkan and Pehlivanlı, 1977, 10). The Municipality of Ankara established a brick factory near Ankara to supply the rising demand for construction material in the city, in the years that followed (Çapa, 2020, 91) **(Figure 2)**. Following the enactment of a new Law of Industrial Promotion in 1927, more factories were opened throughout the country (Özgüven and Cantürk, 2019, 509-510). In the 1930s, three types of bricks were being produced in Istanbul: perforated, pressed, and mud. However, the products were more often than not criticized for their low quality (Selâh, 1934a) **(8)**.

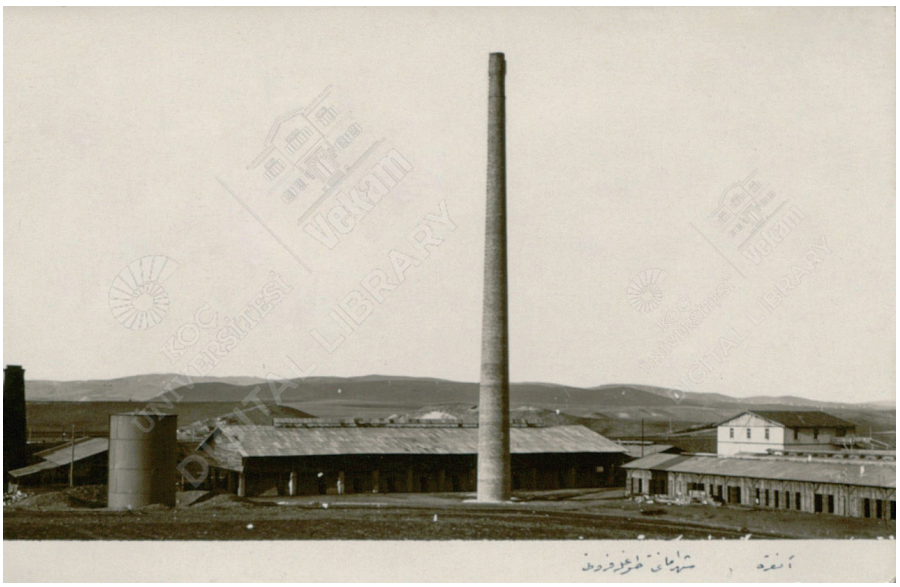

Figure 2. Ankara, the brick and roof tile factory established by the Municipality of Ankara (Koç University Digital Library, VEKAM Collection, Inventory No: 3066).

Brick masonry was commonly used in all kinds of buildings. The masonry technique was enriched by utilizing various materials and hybrid technologies more recently developed. For instance, mixed use of brick masonry and reinforced concrete elements (foundations, floor slabs, lintels, arches, jambs, etc.) or steel beams as *voute française (volta döşeme)* floors were widely observed in large-scale buildings **(9)**. The Grand Post Office (*Büyük Postane – Posta ve Telgraf Nezareti,* built in 1909) in Istanbul is one of the most well-known examples of this style, built of brick masonry with steel profile beams. Photos taken during its construction contain detailed information about the structure and technique **(Figure 3-4)**. Karahan (2018, 54-56) recently observed that columns in the large spaces of the Grand Post Office are also steel. Additionally, he emphasized the potential use of reinforced concrete for its foundation and vaults. This demonstrates that the representative architects of that period were modern, open-minded, and could be regarded as experimentalists.

While brick became the most common construction material, other traditional materials like timber remained essential. However, timber structures were uncommon. One of the few surviving examples is the Cemil Topuzlu Mansion by Vedat Tek in Istanbul, which displays characteristics of both eclectic and the First National Architecture styles **(Figure 5)**. Timber was particularly crucial for floor and roof constructions. In many cases, wooden buttresses support the wide eaves. By the late 19th century, structural timber was imported from Sweden and Norway (Baturayoğlu Yöney, 2008, 101). Although timber was locally available in the early Republican era, the poor quality of local timber products led to widespread complaints. As a result, Russian plywood was particularly favored over local alternatives (Selâh, 1934a).

The introduction of reinforced concrete revolutionized construction in these years, offering improved fire resistance and structural integrity. Reinforced concrete structures were introduced into architecture in Europe and the USA in the late 19th century (Karahan, 2018, 5-26; Moussard, Garibaldi, and Curbach, 2018). They appeared in Ottoman architecture shortly after, almost contemporarily with the rest of Europe. The first reinforced concrete building in the Ottoman Empire was a silo constructed in Haydarpaşa, Istanbul, in 1902 (Karahan, 2018, 28). Companies advertised that reinforced concrete, unlike traditional materials and techniques, was

8. Selâh uses the term "kerpiç tuğla" (mudbrick), traditionally referring to bricks that are dried rather than fired. However, he explains that these bricks were fired under very primitive conditions and were of very low quality. He likely uses the term "kerpiç" to emphasize that these fired bricks were essentially no different from traditional mudbricks.

9. "*Voute française*" is a flooring technique in which the spaces between steel profile beams are filled with brick arches.

Figure 3. Istanbul, the Grand Post Office (Photograph: Selin Sur, 2021).

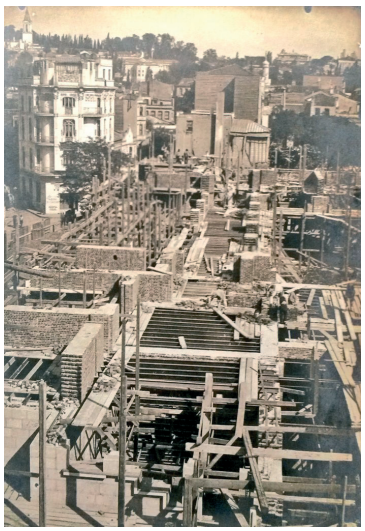

Figure 4. Istanbul, the construction of the Grand Post Office (Anonymous).

Figure 5. Istanbul, Cemil Topuzlu Mansion (Çete, 2022. Photograph: Ali Fuat Devecioğlu).

resistant to earthquakes and fire. After 1910, reinforced concrete became the primary structural system in Türkiye (Karahan, 2018, 37). In the early Republican period, concrete was regarded as a symbol of modernity and extensively used in construction (Tunc and Tunc, 2022).

Documents and projects related to reinforced concrete structures demonstrate its use in ground reinforcement, foundations, structural systems, floor slabs, and building elements, often alongside steel profile beams for floor construction (Karahan, 2018). As reinforced concrete gained wider use, companies such as Coignet, Hennebique, Monier, and Siegwart developed specialized systems with tailored application details, which were implemented by contractor companies **(10)**. Depending on the specific needs and material availability, various construction techniques—such as reinforced concrete floor systems or frames—were proposed for different buildings (Batur, 2009a; Karahan, 2018). Giulio Mongeri, one of the most influential architects of the First National Architecture Movement, served as the contractor of the Hennebique system, which became the most widely used reinforced concrete system in Türkiye (Karahan, 2018, 31). According to Karahan (2018), notable examples of this movement utilizing the Hennebique system include the 1st Waqf Han (*I. Vakıf Han*, built in 1911) (**Figure 6**), the 4th Waqf Han (*IV. Vakıf Han*, built in 1912) (Figure 7), *Mes'adet (Liman) Han* (built in 1912), and *Anadolu Han* (built in 1913) in Istanbul (**11**). An article in *Arkitekt* magazine states that the Hennebique system was applied in the 4th Waqf Han, where the first reinforced concrete dome was built, along with reinforced concrete consoles, floor beams, and the raft foundation (Demiren, 1950, 137).

The acceleration of the construction of masonry and reinforced concrete buildings, railways, and ports in the late 19th and early 20th centuries increased the demand for cement and concrete. This demand led to the importation of cement from countries like Austria, Belgium, France, and Germany (Yurtoğlu, 2015, 115-116). Imported materials accounted for 58% of the cement supply, while 52.7% of cement-based materials (e.g., cement tiles, pipes, stairs, and briquettes) were sourced locally during the Second Constitutional Period (Ural, 1974, 17).

10. Only the use of the Hennebique System in Türkiye was recently researched: Karahan (2018), Yergün and Çelebioğlu (2020), Dabanlı (2021).

11. For a detailed investigation on the complex structural system of the 1st Waqf Han, see Dabanlı (2021).

Figure 6. Istanbul, 1st Waqf Han during its restoration (Photograph: Selin Sur, 2021).

Figure 7. Istanbul, 4th Waqf Han (Photograph: Selin Sur, 2021).

The first cement factory was established in Darıca in 1910, producing cement and hydraulic lime (Dölen and Koraltürk, 2013). Another factory, founded in Eskihisar in 1911, began producing Portland cement, bricks, floor tiles, and pipes (Yurtoğlu, 2015, 116). Production at all factories ceased with the onset of World War I; however, the Darıca factory resumed cement production in 1923 (Yurtoğlu, 2015, 117). Additionally, four new cement factories were opened between 1923 and 1929, one in Ankara and three in Istanbul (Yurtoğlu, 2015, 118). Despite these developments, cement remained an expensive material for an extended period, and the ever-rising demand, especially for Portland cement, could not be met by local production until the 1970s (Baturayoğlu and Ersen, 2009, 63) **(12)**. Until the enactment of the Law of Industrial Promotion in 1927 and the establishment of new cement factories, high transportation costs within the country led to a preference for importing cement to coastal cities from various countries: Russian cement for the Black Sea region, French and Italian cement for the Mediterranean region, and primarily Romanian and German cement for Istanbul (Selâh, 1934b).

Some traditional construction materials evolved during this period and found wider application. For centuries, iron had been used for structural purposes in Ottoman architecture (Tanyeli, 1990). In the 19th century, its applications expanded due to its advantages and the introduction of new architectural buildings and elements (Köksal, 2009). Industrial iron and steel remained imported materials until the establishment of the Turkish Iron and Steel Corporation in 1937. Before local production began, iron was imported from Belgium, England, Italy, the Netherlands, Russia, Sweden, and Norway (Baturayoğlu Yöney, 2008, 101). Wrought and cast iron were used as canopy and glass ceiling structures, buttresses to support the wide eaves, structural frames for building projection floors, bars for windows and doors, railings, and fences **(Figure 8)**.

Structural steel had been employed in the Ottoman construction market since the 19th century, primarily imported from Germany (Baturayoğlu Yöney, 2008, 101). The structural use of steel profiles is evident in many buildings from the late 19th and early 20th centuries, especially in Istanbul. During this period, steel partially replaced timber in floor structures and was used as beams to construct *voute française* floors or reinforced concrete slabs **(13)**. Steel profiles were also incorporated into ferroconcrete systems to support and strengthen concrete load-bearing elements.

Ferroconcrete is a construction technology in which steel profiles are embedded within load-bearing elements to strengthen concrete. In such systems, the vertical structural components consist of reinforced concrete columns encased in steel profiles, while the horizontal components are reinforced concrete slabs supported by steel beams, typically placed across the shorter span of a space (Yergün, 2002, 273-274) **(Figure 9)**. The 4th Waqf Han is the only confirmed building that was constructed using ferroconcrete technology during the First National Architecture Movement (Uzun, 2008, 112-120; Karahan, 2018, 116). According to Uzun (2008), several other buildings from the period, including the Grand Post Office and the Imperial Offices of Land Registry, are likely to have employed this system.

Finishing Materials

Like structural materials, finishing materials evolved and became more diverse during this period. Although natural stone was scarce and its

12. For more on the technical qualities of the early types of cement used in this period, see Baturayoğlu and Ersen (2009).

13. For one of the earliest examples: Çelebioğlu and Yergün (2019).

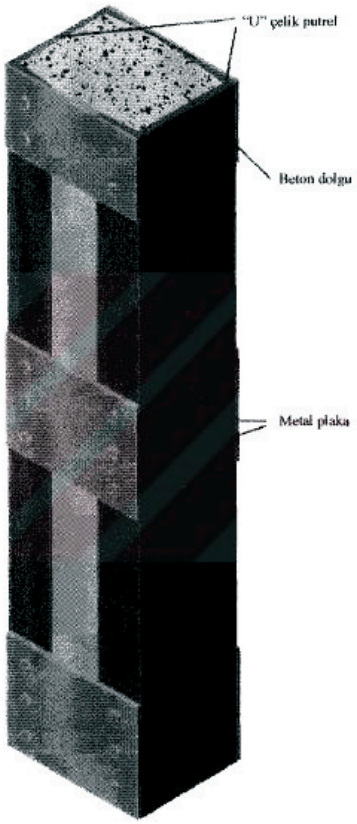

Figure 8. Istanbul, the iron canopy and railings of the Grand Post Office (2021).

Figure 9. Detail drawing of a ferroconcrete column (Yergün, 2002, 274).

structural use limited, it was widely used as a finishing material for cladding walls and floors. This practice allowed architects to retain the visual and symbolic qualities of stone (e.g., durability, permanence), even when materials like brick and reinforced concrete were increasingly favored for structural purposes. By adapting traditional stonework techniques and merging them with modern design elements, the architects of the First National Architecture Movement were able to evoke a sense of continuity with the past while embracing the new technological possibilities of the 20th century. In addition to imported stones, local varieties such as limestone, sandstone, and andesite were used wherever available.

Stone cladding often combined different styles and materials, creating visually rich textures and dynamic effects. Many façades featured a combination of rustic or ashlar masonry with bossed stones on the plinth walls, adding a sense of strength and durability. The upper sections were typically finished in ashlar stonework, with different stone types used to create subtle contrasts and refinement **(Figure 10)**. The alternating use of stone allowed for artistic expression, creating bichrome effects by alternating different types of stone in the façade and arched openings **(Figure 11)**. A more common approach involved cladding the plinth walls with stone, while the upper portions of the façade were finished with plaster. Stone was also an indispensable material for interiors, particularly in prestigious buildings **(Figure 12)**.

Technological innovations and industrialization introduced artificial stone to the construction market as a convenient substitute for natural stone. Artificial stone (In Turkish, *piyer artifisiyel*, derived from French *pierre*

Figure 10. Ankara, the main façade of the Turkish Society Building (Photograph: Selin Sur, 2024).

Figure 11. Ankara, former Ministry of Finance, now the Rectorate of the Social Sciences University of Ankara (Photograph: Selin Sur, 2021).

Figure 12. Ankara, the entrance hall of the Turkish Society Building (Photograph: Selin Sur, 2024).

Figure 13. Ankara, the General Directorate of İş Bank (Photograph: Selin Sur, 2021).

Figure 14. Ankara, the General Directorate of Ziraat Bank (Photograph: Selin Sur, 2021).

artificielle) was a technique in which cement-, hydraulic lime-, or lime-based plasters were textured with various tools to resemble stone (Baturayoğlu Yöney, 2008). This method allowed plasters to mimic the appearance of cut stone, bossed stone, or dressed stone and even replicate the intricate details of carved stone with geometrical or floral decorations. Some of the finest examples of artificial stonework can be seen in the General Directorate of İş Bank (now Museum of Economic Independence) and the General Directorate of Ziraat Bank in Ankara **(Figure 13-14)**. In some cases, artificial stone was used alongside natural stone on façade cladding, as seen in the Imperial Offices of Land Registry in Istanbul **(Figure 15)**.

In addition to artificial stone, cement-based plasters such as *Edelputz* (German for 'fine plaster') and *Teranova* were used for façade cladding in the late 19th and early 20th centuries (Baturayoğlu Yöney, 2008, 225).. Despite being frequently associated with buildings from this period, *Edelputz* has rarely been clearly defined or analyzed in existing studies. Nevertheless, articles introducing new buildings from the early 1930s to the mid-1940s in the journal *Mimar* acknowledged the use of these plasters. One notable example is Giulio Mongeri's Çelik Palas in Bursa, where both *Edelputz* and *Piyer artifisiyel* were used (Monceri, 1932) **(14)**.

Mimar (Architect) Hüseyin (1932) noted in an article that *Edelputz* and *Terranova* had already been used since the late 1920s in Ankara, Bursa, and Istanbul. He highlighted their advantages, including resistance to cracking, porosity, rainproof qualities, and retaining color quality over time. According to the same article, *Terranova* plaster consists of 70% sand and aggregate (marble chips), 25% slaked lime, and 5% mineral earth paint, while *Edelputz* is made from the same mixture with larger aggregates (stone chips). These plasters were particularly favored for their ability to be colored, offering both functional and aesthetic benefits **(Figure 16)**. Moreover, they could serve as artificial stone cladding if joints are cut to replicate ashlar masonry.

The continuous demand for cement-based materials, despite their high cost and limited supply, as mentioned earlier, proves that they had become essential and indispensable for construction activities in the early 20th century. In addition to making concrete, mortar, plaster, and standardized mass-production products such as friezes, moldings, chimney parts, balustrades, and handrails (Cengizkan, 2022, 45), cement was used for

14. Giulio Mongeri's last name is written as pronounced in the journal.

Figure 15. Istanbul, detail from the former Imperial Offices of Land Registry. The ground floor is clad with artificial stone until the arch level of the windows. Above that level is stone-clad. (Photograph: Courtesy of Kadir Ekinci, 2024)

Figure 16. Terranova and Edelputz plasters (Mimar Hüseyin, 1932).

flooring materials, such as floor tiles (In Turkish, *karosiman*, derived from French *carreau ciment*), terrazzo tiles, and mosaic **(Figure 17)**. At the same time, stone and wood floorings continued to be traditionally used **(Figure 18-19)**.

Gypsum mortar and plaster were materials that had been used in Ottoman architecture for centuries, and they continued to be employed during the First National Architecture Movement. They were used for interior decoration—on cornices and as column capitals featuring traditional Ottoman motifs such as stalactite or diamond shapes, above doors to give them the appearance of monumental portals, and in the construction of inner windows (*revzen*) **(Figure 20)**.

A typical traditional material for both exterior and interior decoration was ceramic tiles. Tiles began to appear on façades in the last quarter of the 19th century (Batur, 2002). This trend continued during the First National Architecture Movement, with rearranged models of Iznik tiles, sometimes incorporating Kufic script, were produced in Kütahya and commonly used (Sözen, 1996, 17). However, by the time the movement gained momentum, workshops in Kütahya—notably those of Hadji Minasyan and Mehmed Emin Efendi—had already faced significant challenges, and their production capacity had been severely depleted (Şahin, 1988, 132). Despite these difficulties, Mehmed Emin Efendi's tiles embellished several notable buildings in Istanbul, such as the Hobyar Masjid, the Büyükada and Haydarpaşa Ferry Piers, and the Imperial Offices of Land Registry (Arlı, 1989) **(Figure 21)**. Following the demographic shifts after the wars and during the early years of the Republic, there was a shortage of skilled labor to design and produce tiles, although some workshops remained operational (Şahin, 1988, 134). This decline in ceramic production is evident

Figure 17. Ankara, the mosaic stairs and floor tiles of the General Directorate of Ziraat Bank (Photograph: Selin Sur, 2024).

Figure 18. Ankara, stone flooring in the General Directorate of Ziraat Bank (Photograph: Selin Sur, 2024).

Figure 19. Ankara, wooden flooring in the Second Parliament of the Republic of Türkiye (Photograph: Selin Sur, 2024).

in later examples, as the quality of tiles from the Ottoman period far surpassed those produced in the Republican period, in terms of design and craftsmanship **(Figure 22)**.

Glass production advanced significantly in the second half of the 19th century. Although there were several attempts by local and foreign entrepreneurs to establish glassmaking factories in Istanbul from the early 19th century onward, production remained unsatisfactory, and local products struggled to compete with imports until the establishment of the Paşabahçe Glass Factory in 1935 (Kosova, 2014, 30-32). Despite this, light structures made of iron and glass were introduced to Ottoman architecture during the 19th century, marking the use of modern materials in significant buildings. In prestigious buildings of the First National Architecture Movement, stained glass was used in both ceilings and windows. Notable examples include the Grand Post Office in Istanbul and the General Directorates of İş Bank and Ziraat Bank in Ankara, which feature remarkable stained-glass ceilings **(Figure 23)**. The stained-glass for İş Bank and Ziraat Bank was imported from Milano's Corvaya-Bazzi & C company (Aslanoğlu, 1980). Glass was typically combined with iron structures, such

Figure 20. Ankara, revzens and ceiling decorations of the Ankara Palace (Koç University Digital Library, VEKAM Collection, Inventory No: 2598).

Figure 21. Istanbul, the ceramic tiles of the Hobyar Masjid (Kültür Envanteri, no: 7616, 2024. Photograph: Ali Osman Dilekoğlu).

Figure 22. Ankara, the ceramic tiles of the Ethnography Museum (Photograph: Selin Sur, 2021).

Figure 23. Ankara, the stained-glass ceilings of the General Directorates of İş Bank (left, 2020) and Ziraat Bank (right, 2024) (Photographs: Selin Sur).

as in the entrance canopy of the General Directorate of İş Bank in Ankara (**Figure 24**).

Wood was widely used for non-structural elements in buildings. Wood sheathing was commonly applied to roofs, ceilings, and the soffits of eaves, often ornamented with geometric patterns of wooden strips and/or traditional paintings. In addition, wood was used for floor and wall sheathing, windows, doors, railings, furniture, and other architectural details. (**Figure 25**).

Flat roof tiles, known as Marseille-type tiles in Turkish, replaced traditional curved tiles in the 19th century. These tiles were predominantly imported from Marseille, France, and Livorno, Italy (Çiftçi and Yergün, 2010). According to the *Revue Technique d'Orient* (1912), the Ottoman Empire imported tiles primarily from France, followed by Greece and Italy, between 1908 and 1909. Although flat tiles were produced in eight to ten factories during the early years of the Republic, they were of low quality and struggled to compete with imported materials (Selâh, 1934a). Another material commonly used for roofs, particularly domes, was lead. Lead was

Figure 24. Ankara, the glass canopy of the General Directorate of İş Bank (Photograph: Selin Sur, 2021).

Figure 25. Ankara, the use of wood on the ceiling and other elements in the Second Parliament of the Republic of Türkiye (Photograph: Selin Sur, 2024).

Figure 26. Ankara, the use of roof tiles and lead in the former General Directorate of Monopoly (Photograph: Selin Sur, 2021).

Figure 27. Ankara, the Ethnography Museum (Photograph: Selin Sur, 2021).

rarely used for hip roofs, such as in Haydarpaşa Ferry Pier in Istanbul. The mainstream application for the roofs was covering hip roofs with flat tiles and domes with lead (**Figure 26**). A unique example is the dome of the Ethnography Museum in Ankara, notable for its tricolor design, which is predominantly covered with what appears to be copper **(Figure 27)**.

The First National Architecture Movement stands as a testament to the innovative integration of traditional materials with modern technologies. This fusion not only reflected the broader socio-political changes of the period but also set the stage for modern Turkish architecture, where new materials and technologies became central to architectural expression.

A CRITICAL ANALYSIS OF THE EXISTING LITERATURE

The literature review revealed several contradictory statements and confusion about documented buildings' construction systems and materials. Personal observations during site visits to the mentioned buildings confirmed that some of the oft-repeated information is inaccurate. Obviously, it is nearly impossible to reach certain conclusions about the structural systems without a detailed examination and research. Therefore, it is necessary to highlight certain inconsistencies and inaccuracies in the current literature to prevent their repetition in future research and encourage a more critical approach among researchers. This section provides a few selected examples to demonstrate that the buildings from this period need better examination. A table is included, comparing previous identifications with a reevaluation based on personal observations conducted during site visits and research **(Table 1)**.

The most common mistake in the literature is that any building with reinforced concrete elements (such as floor slabs, lintels, etc.) is classified as a 'reinforced concrete structure,' even though they do not have a reinforced concrete frame structural system. This confusion arises from the inadequate analysis of buildings and the automatic adoption of information, sometimes inaccurate, in the existing literature. It can be difficult to correctly identify the construction type of this period's buildings through literature research or even observation on site, as the walls are usually as thick as any component beams and columns, rendering the reinforced concrete frame invisible and indistinguishable. Therefore, they can easily be mistaken for masonry structures. The most reliable information comes from the design projects of these buildings, if extant, as well as survey and restoration reports, since the structural elements can be analyzed through these documents.

	Aslanoğlu (1980)	Çuha (1989)	Yergün (2002)	Alpagut (2005)	Uzun (2008)	Yavuz (2009)	Karahan (2018)	Dabanlı (2021)	Overall evaluation based on personal observation, literature and archival research
The Imperial Offices of Land Registry (1908) Architect: Vedat Tek					Ferroconcrete				Artifical stone+Stone cladding
The Grand Post Office (1909) Architect: Vedat Tek					Ferroconcrete		Hybrid (Steel columns+Reinforced concrete elements (?))		Hybrid structure, Stone cladding+Plaster
1st Waqf Khan (1911) Architect: Kemaleddin Bey						Hybrid (Stone masonry +Steel profile floors)	Reinforced concrete frame+Iron profiled floor slabs	Hybrid (Reinforced concrete frame+Masonry walls+Steel profiled floor beams)	Hybrid (Reinforced concrete frame+Masonry walls+Steel profiled floor beams), Stone cladding+Artificial stone
4th Waqf Khan (1912) Architect: Kemaleddin Bey			Steel frame		Ferroconcrete	Hybrid (Stone and brick masonry+Steel frame)	Reinforced concrete frame with steel elements		Ferroconcrete, Stone cladding+Plaster
The First Parliement of the RoT (1920) Architect: Salim Bey									Stone masonry
The Second Parliement of the RoT (1924) Architect: Vedat Tek	Stone masonry								Brick masonry, Stone cladding+Plaster
The Ministry of Finance (1925) Architect: Yahya Ahmet	Stone cladding	Reinforced concrete beams							Reinforced concrete frame (?), Stone cladding+Plaster
Head Office of the Ottoman Bank (1926) Architect: Giulio Mongeri	Reinforced concrete frame, Stone cladding								Reinforced concrete frame (?), Artificial stone
Gazi and Latife Model Schools (1926) Architect: Mukbil Kemal Taş	Stone masonry			Reinforced concrete frame, Edelputz plaster					Artificial stone+Stone cladding
The Ankara Palace (1928) Architect: Vedat Tek / Kemaleddin Bey	Reinforced concrete frame					Reinforced concrete frame			Reinforced concrete frame, Artificial stone+Stone cladding+Plaster
The Ethnography Museum (1928) Architect: Arif Hikmet Koyunoğlu	Reinforced concrete frame+Stone cladding	Reinforced concrete beams							Reinforced concrete frame (?), Stone cladding+Plaster
General Directorate of Monopoly (1928) Architect: Giulio Mongeri	Reinforced concrete frame, Artificial stone plaster								Reinforced concrete frame (?), Artificial stone+Plaster
General Directorate of İş Bank (1929) Architect: Giulio Mongeri	Reinforced concrete frame+Stone cladding								Reinforced concrete frame, Artificial stone+Plaster
General Directorate of Ziraat Bank (1929) Architect: Giulio Mongeri	Reinforced concrete frame, Stone cladding+Artificial stone plaster								Reinforced concrete frame, Artificial stone+Plaster
Turkish Society Building (1930) Architect: Arif Hikmet Koyunoğlu	Hybrid (Masonry+Reinforced concrete elements)								Hybrid (Masonry+Reinforced concrete elements), Stone cladding+Artificial stone

Table 1. Identifications by different scholars and re-evaluation of construction materials and structural types of the buildings visited within the scope of this research.

According to the literature, most buildings in Ankara from this period were constructed using reinforced concrete systems, and masonry structures were relatively rare, particularly in public buildings. However, many buildings employed a combination of reinforced concrete elements and brick masonry, such as the Turkish Society Building (*Türk Ocağı*, now the State Museum of Arts and Sculpture, built between 1927 and 1930). In his memoirs, this building's architect, Arif Hikmet Koyunoğlu, noted that it had a foundation of roughly cut stone, walls of brick masonry, and floors made of reinforced concrete slabs, claiming that this was the first instance of reinforced concrete being used in Ankara **(Figure 28)(15)**. However, in an interview about the construction of the Ethnography Museum (built between 1925 and 1928), Koyunoğlu mentioned that he had to demonstrate to workers how to tie reinforcing bars to create reinforced concrete beams (Birkan and Pehlivanlı, 1977, 10). This suggests that reinforced concrete had been used before the Turkish Society Building. He contradicts himself and overlooks the fact that the construction of the Ankara Palace (built between 1924 and 1928), known to have a reinforced concrete frame, began prior to both buildings. Thus, the Ankara Palace should be considered the first example of reinforced concrete use in the city. Although this may seem like a minor detail, it alters the timeline and understanding of Ankara's architectural history.

A common assertion in the literature is that the Harikzedegân Residences (*Harikzedegân Apartmanları*, built in 1922) were the first reinforced concrete

15. Arif Hikmet Koyunoğlu's memoirs were on exhibit in 2021, in a section dedicated to him in the State Museum of Arts and Sculpture.

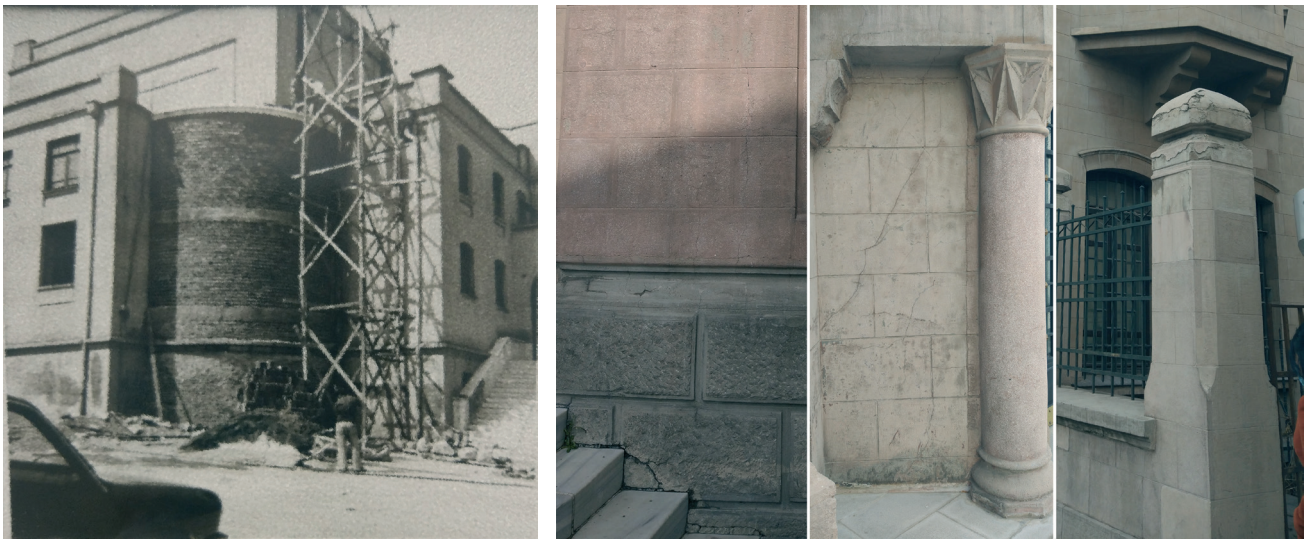

Figure 28. Ankara, the Turkish Society Building during restoration (Image from the State Museum of Arts and Sculpture).

Figure 29. Ankara, the deteriorations on the artificial stone claddings of the former General Directorate of İş Bank (left, 2021) former General Directorate of Monopoly (center, 2021), and the former Head Office of Ottoman Bank (right, 2021)(Photographs: Selin Sur).

frame structures designed by Kemaleddin Bey **(16)**. However, the Hennebique reinforced concrete system was used in the 1st and 4th Waqf Hans (built in 1911 and 1912, respectively) in Istanbul, both Kemaleddin Bey's designs (Karahan, 2018; Dabanlı, 2021). The reason behind the misjudgment might be that the 1st Waqf Han was previously classified as stone masonry with steel profile beams, and the 4th Waqf Han as a steel frame structure with stone and brick masonry by Yavuz (2009). He must have classified the 4th Waqf Han as a steel frame structure since steel was used to strengthen the concrete in the ferroconcrete technology, as mentioned earlier.

The literature research revealed misleading information about materials as well. In addition to the misidentification of stone types, artificial stone seems to be easily mistaken for its natural counterpart **(17)**. In fact, it is easily distinguishable because it deteriorates like plaster and can be identified correctly upon close observation **(Figure 29)**. Visual inspections during site visits in Ankara at the General Directorate of the İş Bank, the General Directorate of Ziraat Bank, the Head Office of Ottoman Bank (now Ulus Garanti Bank), and the General Directorate of Monopoly (*İnhisarlar Baş Müdürlüğü*, now Yunus Emre Institute), confirmed that these buildings were clad with artificial stone. Despite the texture of the plasters being quite similar to each other, all but the General Directorate of Monopoly were identified as stone claddings by Aslanoğlu (1980) **(18)**.

Another example is the Gazi and Latife Model Schools (*Numune Okulları*) in Ankara. They were identified as stone masonry by Aslanoğlu (1980) and as reinforced concrete structures clad with *Edelputz* by Alpagut (2005). On-site observations revealed that they are limitedly clad with stone on the front façades and mostly plastered. Old pictures show the sprayed coating on the plinth wall and joint imitations, hinting that the buildings were clad with artificial stone **(Figure 30-31)**. Thus, contrary to opinions expressed by these scholars and the present situation, these buildings probably had artificial stone cladding, which was later replaced by simple plaster. Likewise, we learn from the restoration reports (Ülgen, 1962) that the Ankara Palace had artificial stone-like cladding, also visible in old pictures; however, it has been lost through successive restorations **(Figure 32-33)**. Very likely, then, more buildings have lost their original characteristics in terms of materials and technologies.

16. For example, Tanaçan and Ersoy, 2008, 70. Çolak and Erarslan (2021, 212) claim that they were the first reinforced concrete structures in the country.

17. Yavuz (2009) documented Kemaleddin Bey's Bostancı Kuloğlu and Bebek Mosques as finely-cut küfeki structures. Although I did not visit these sites, I was able to ascertain by examining photographs that both mosques are mostly plastered, with limited use of a much darker stone in the arches, jambs, mouldings, etc. The stone used in Bostancı Kuloğlu Mosque is too brownish compared to küfeki; in Bebek Mosque, it is yellowish and probably sandstone.

18. Aslanoğlu also misidentified the artificial stone cladding on two buildings in Izmir. Although I did not visit these sites, photographs of the buildings reveal their true façade characteristics. The cladding on the plinth wall of the Osmanlı Bank (now Garanti Bank) was incorrectly identified as ashlar stone (Aslanoğlu, 1980, 245). Similarly, the Stock Exchange Palace (Borsa Sarayı) was described as having ashlar stone cladding and "ashlar stone given the appearance of plaster" (Aslanoğlu, 1980, 263), yet the photographs suggest otherwise, revealing differently textured artificial stone.

Figure 30. Ankara, present state of the former Gazi and Latife Model Schools (2021).

Figure 31. Ankara, former state of the former Gazi and Latife Model Schools (Kültür Envanteri, no: 19817).

These discrepancies highlight the need for meticulous examination of buildings from this period, where both traditional and modern technologies and materials were commonly used together. Relying on limited research and superficial observations and, perhaps, the unawareness of the period's materials and technologies has perpetuated misinformation in scholarly literature and has likely contributed to the loss of original architectural characteristics during restoration efforts. To preserve the integrity of these structures, it is crucial to approach them with a scrutinizing perspective and evaluate them using a holistic methodology, looking beyond their appearances. This includes incorporating state-of-the-art imaging systems to analyze structural systems and cross-referencing archival data before any intervention. Avoiding standardized and careless restoration practices is essential to ensure these buildings are rightfully preserved and passed on to future generations.

CONCLUSIONS

The late 19th and early 20th centuries marked a period of rapid transformation in production methods due to the Industrial Revolution, which led to significant innovations in construction materials and architectural technologies. In parallel, the Westernization efforts of the

Figure 32. Ankara, visible joint imitations on the main entrance of the Ankara Palace (Koç University Digital Library, VEKAM Collection, Inventory No: 2133).

Figure 33. Ankara, present state of the main entrance of the Ankara Palace (Photograph: Selin Sur, 2024).

Ottoman Empire and the rise of Turkish nationalism fueled changes in architectural education, practice, and style. The First National Architecture Movement emerged from this environment, and its buildings reflect the social, cultural, and historical shifts of the time. Therefore, these structures require preservation in line with international conservation principles, with particular attention to the construction technologies and materials used.

The study has confirmed that contemporary architects skillfully embraced new technologies (such as reinforced concrete frame or ferroconcrete) and integrated materials and technologies introduced by the Industrial Revolution with the traditional ones (masonry construction methods combined with reinforced concrete foundations, slabs, and other elements such as lintels, jambs, etc.). Steel profiles were used as beams in masonry structures to construct *voute française* floors, and to strengthen concrete elements in ferroconcrete constructions. This was a period when masonry and reinforced concrete structures were replacing traditional timber structures. Timber continued to be an important structural material used in flooring and roof systems; however, surviving timber frame structures are rare. Brick was highly demanded for masonry buildings since stone provision and craftsmanship were problematic, especially during the Republican period, stemming from the demographic changes and economic hardships. Despite difficulties, stone remained in use, primarily for foundations and wall cladding, with limited application in wall construction. Cement and cement-based materials were also in high demand, used for both structural and finishing purposes, including concrete, building elements, various types of plasters, and flooring materials. Wrought and cast iron, stained glass, roof tiles, wood, and gypsum were other materials used for finishing purposes. Although construction materials were mostly imported, there were several attempts to produce them locally since the late 19th century, necessitating the establishment of various new factories.

The contradictions found in the literature regarding the construction systems and materials of these buildings demonstrate the need for careful and detailed study. Without thorough analysis, restoration efforts risk further altering or erasing the original materials and architectural features. The possibility of composite or experimental structures complicates identification, underscoring the importance of careful documentation and analysis during restorations to preserve the integrity of these structures.

This research lays the foundation for further studies, opening up avenues for more in-depth exploration. The conservation practices of these buildings, the distribution of different technologies and materials used throughout Anatolia, and the role of modern materials and technologies in the forming of a new architectural style deserve further and comprehensive research. In-depth archival research into the periodical journals and newspapers about the production and importation of construction materials, as well as publicities for new materials and technologies from this period, will enrich the literature. These efforts will ensure that the architectural legacy of this transformative period is well-recognized and contribute to its preservation for future generations.

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Anahtar Sözcükler: Geç Osmanlı mimarlığı; Erken Cumhuriyet mimarlığı; Birinci Ulusal Mimarlık Akımı; yapı malzemeleri; yapım teknolojileri.

BİRİNCİ ULUSAL MİMARLIK AKIMINDA YAPI MALZEMELERİ VE YAPIM TEKNOLOJİLERİ: GELENEĞİ VE MODERNLİĞİ BULUŞTURMAK

Bu araştırma, 19. yüzyılın sonu ve 20. yüzyılın başlarında yaşanan hızlı sanayileşme ve sosyo-politik değişimlerle şekillenen Birinci Ulusal Mimarlık Akımı sırasında kullanılan yapı malzemeleri ve teknolojilerini incelemektedir. Osmanlı Batılılaşması ve Türk milliyetçiliğinin yükselişi ile ilişkilenen bu akım, geleneksel mimari unsurları ve Sanayi Devrimi'nin getirdiği modern yeniliklerle harmanlamıştır. Bu nedenle, bu döneme ait yapıların uluslararası koruma ilkelerine uygun olarak, özgün özellikleri muhafaza edilerek korunması gerekmektedir. Çalışma kapsamında, dönemin malzeme ve teknolojilerini kapsamlı bir şekilde sunabilmek adına literatür ve arşiv araştırmaları yapılmış, ayrıca Ankara ve İstanbul'da, farklı dönemleri temsil eden ve çeşitli mimarlar tarafından tasarlanan bazı önemli binalar ziyaret edilmiş ve sınırlı gözlemler gerçekleştirilmiştir. Çalışma, Portland çimentosu, çimento bazlı malzemeler, beton ve çelik gibi modern malzemelerin yanı sıra, fer-beton ve betonarme iskelet gibi teknolojilerin de yığma yapım sistemi ve ahşap çatkı gibi geleneksel yöntemler ile birlikte kullanıldığını göstermektedir. Ayrıca, bu yeni malzeme ve teknolojilerin mevcut mimari uygulamalara entegre edildiği, örneğin yığma yapılara betonarme döşeme ya da çelik kirişler eklenmesi gibi uygulamaların yaygın olduğu ortaya konmuştur. Araştırma, mevcut literatürde yapı malzemeleri ve taşıyıcı sistemlerin tespiti ile ilgili tutarsızlıklar ve çelişkileri de vurgulayarak, gelecekteki çalışmalarda daha

titiz ve doğru belgeleme yapılması gerektiğini ortaya koymaktadır. Bu dönemin yapılarının, inşa edildikleri dönemin mimari teknolojileri dikkate alınarak analiz edilmesi ve değerlendirilmesi gerektiği, böylece uluslararası koruma ilkelerine uygun şekilde korunmalarının sağlanabileceği sonucuna varılmıştır. Türkiye mimarlık tarihinin önemli bir parçasını oluşturan bu yapıların doğru şekilde korunabilmesi, kullanılan yapı malzemeleri ve yapım teknolojilerinin tanınması ve doğru tespit edilmesiyle mümkün olacaktır.

CONSTRUCTION MATERIALS AND TECHNOLOGIES IN THE FIRST NATIONAL ARCHITECTURE MOVEMENT: BRIDGING TRADITION AND MODERNITY

This article explores the construction materials and technologies employed during the First National Architecture Movement, marked by rapid industrialization and socio-political change in the late 19th and early 20th centuries. The movement, rooted in Ottoman Westernization and the rise of Turkish nationalism, blended traditional architectural elements with modern innovations brought about by the Industrial Revolution. Therefore, buildings constructed during this period ought to be preserved in their original characteristics, and according to international conservation principles. Within this research, literature and archival investigation have been conducted to present a comprehensive overview of the period's technologies and materials. In addition, limited site visits and observations were carried out on some prominent buildings in Ankara and Istanbul, representing different periods and designed by various architects. The study demonstrates that modern materials such as Portland cement, cement-based materials, concrete, and steel, as well as technologies like ferroconcrete and reinforced concrete frame, were used alongside traditional ones such as masonry and timber framing. Moreover, these new materials and technologies were integrated into established architectural practices, such as masonry structures with reinforced concrete floor slabs or steel beams. The research also highlights discrepancies and contradictions in the existing literature regarding the identification of building materials and structural systems, revealing the need for more meticulous and accurate representation in future studies. The article concludes that buildings from this period must be analyzed and evaluated through the lens of the architectural technologies of their time, ensuring their preservation in accordance with international conservation principles. Proper recognition and identification of these construction materials and technologies will facilitate the rightful conservation of these buildings, which form an essential part of Türkiye's architectural heritage.

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