PROSTOR

33 [2025] 1 [69]

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ZNANSTVENI ČASOPIS ZA ARHITEKTURU I URBANIZAM

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MEANINGS | ZNAČENJA

PROSTOR *m* space, room; (*površina*) area; (*zona*) tract; (*prostranstvo*) extent, expanse; (*za kretanje/ manevriranje*) elbow-room, playroom, leeway, scope; (*prostorije, smještaj*) premises, accomodation | **životni** ~ living space; **stambeni** ~ housing; **školski** ~ school space; **poslovni** ~ office space/premises; ~ **za noge** legroom; *prema raspoloživom* ~**u** on a space available basis; *fig* **pružati** ~**za** offer/give scope for; **posvetiti (pokloniti)** ~ (*u novinama*) devote (give) space to; **zbog pomanjkanja** ~**a** because of limited space; **radi uštede na** ~**u** to save space; **povreda zračnog** ~**a** violation of airspace, aerosp; **istraživanje** ~**a** space exploration

ŽELJKO BUJAS (1999.), *Veliki hrvatsko-engleski rječnik | Croatian-English dictionary,* Nakladni zavod Globus, Zagreb

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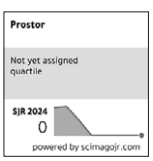

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Fig. 1 City of Graz Park, 2024

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Historical and Spatial Development of City of Graz Park (Block 21), Pula, Croatia

archaeological integration
City of Graz Park (Block 21)
Kolacio, Zdenko
landscape heritage
Pula, Croatia
urban heritage

The article analyses the historical and spatial transformation of Block 21 in Pula, currently occupied by the City of Graz Park. The aim is to trace the site's development from antiquity to the present day and examine the layered changes in its urban and landscape structure. The methodology combines the analysis of historical maps, archival documents, conservation and urban planning studies, as well as field research. Particular attention is given to the impact of World War II destruction, the post-war landscape concept by architect Zdenko Kolacio, and subsequent planning documents. The research shows that while the area has retained ecological value, its spatial structure and historical legibility have significantly changed. The findings contribute to a deeper understanding of the area's urban development and provide a basis for further study of its urban, architectural and archaeological context.

Introduction

The city of Pula has a continuous settlement history spanning over three millennia: from the proto-urban settlement of the Ilirian tribe Histri, through the Roman and Byzantine periods, the medieval commune, to the Austro-Hungarian main naval war port and the modern city. This layered urban development is still legible today, making Pula a rare European city whose historic core preserves architectural remains from all of these eras (Krizmanić, 2005: 113).

Within this complex urban palimpsest, the City of Graz Park[1] – also referred to, in conservation and planning documents, as Block 21 – stands out as a spatial fragment shaped by both continuity and rupture (Modus d.o.o, 2016). Once densely built and integrated into the compact historic urban core, the area was almost entirely demolished at the end of World War II and later transformed into a green public space. The block is located within the protected zone of Pula's historic centre[2], adjacent to the main city artery and the former medieval wall, and described in planning documentation as "an important link in the development of the urban structure" (Modus d.o.o, 2016).

Block 21 is defined by Sergijevaca Street[3], Benedictines Abbey Street[4], Flacius Street[5], and St. Nicholas Passage[6]. Historically, Tradenik Street[7] (today, only roughly visible as a pedestrian connection through the park) went through the middle of the block in the east-west direction. Therefore, historically, there were actually two building blocks. The area is situated between the Old Market[8] to the west and, and to the east, Block 22 through which *Vicolo della Bissa*[9] extends diagonally toward Tradenik Street (Fig. 2).

This article traces the historical and spatial transformation of Block 21 from antiquity to the present, with a particular focus on the evolution of its landscape structure. Relying on an interdisciplinary analysis of archival materials, cartographic sources, archaeological data, and field research, the study offers a chronological reading of the area's transformation. Critical evaluation of certain historical layers will emphasize the identified desir-

1 In this article, the name "Park Graz" will be used for the "City of Graz Park"

2 The area of Block 21 in Pula is not a listed cultural heritage property, but it is located within the boundaries of the cultural heritage complex "Cultural and historical entity of the city of Pula" (registration number Z-5638; Decision of 8 November 2012) (NN 46/2013).

3 The street has changed names throughout history. The first recorded name was in 1862 when it was called *Gasse*, and one part of it was called *Via Misericordia*. From 1869 to 1872, parts of the street were called *Via San Francesco*, *Via del Teatro*, *Via Portaurea*. From 1889 to 1938, it was called *Via Sergia*, in 1948, *Ulica Boraca*, in 1952, *Ulica Prvog Maja*, from 1956 to 1961 it was called *Ulica Prvi Maj*, in 1970, *Prvomajska ulica*, and in 1976 again *Ulica Prvog Maja*. Today, it is called *Ulica Sergijevaca* (Sergijevaca Street) (Krizmanić, 2008a: 293).

4 From 1869 to 1923, the street was called *Via Abbazia*, in 1938 *Via dell' Abbazia*, and in 1948 *Opatijska ulica* (Krizmanić, 2008a: 136-137).

5 Flacius Street (*Flacijusova ulica*) was named after Matthias Flacius Illyricus. In 1869 it was called *Piazza della Riva*, in 1886 *Corsai della Riva* (part) / *Riva del Mercato* / *Contrada dell'Arsenale*; in 1912 it changed its name to *Via dell'Arsenale*, and in 1916 to *Via Francesco Ferdinando*. In 1918 it was called *Via Mazzini* / *Via Garibaldi*; in 1938 *Via Giuseppe Mazzini* / *Via Giuseppe Garibaldi*, and since 1948 it has been called Rade Končara Street. Today it is called Flacius Street (Krizmanić, 2008a: 173-174).

6 The street has been called *Vicolo San Nicolo* since 1869 (Krizmanić, 2008a: 307).

7 One of the oldest streets in the historic center. Before 1948, the street was always called *Via Tradonico*, since its first official designation in 1869. Before 1869, it was called Calle (Contrada) Lombardo. (Krizmanić, 2008a: 323)

8 The toponym Old Market (*Mercato vecchio*) appears in the Middle Ages, precisely after the Old Market (*Stara tržnica*), one of four smaller squares created during the Middle Ages in the ancient forum area. (Krizmanić, 2008a: 300)

9 The toponym refers to an ancient, medieval street that no longer exists. In 1869 it was called *Calle della Bissa*, from 1869 to 1948 it was called *Vicollo della Bissa*, and after that it was nameless. A small part of the street towards Maksimijanova Street is still preserved. The street is named after its winding path, which was established in the Middle Ages based on the ancient layout. (Krizmanić, 2008a: 339)

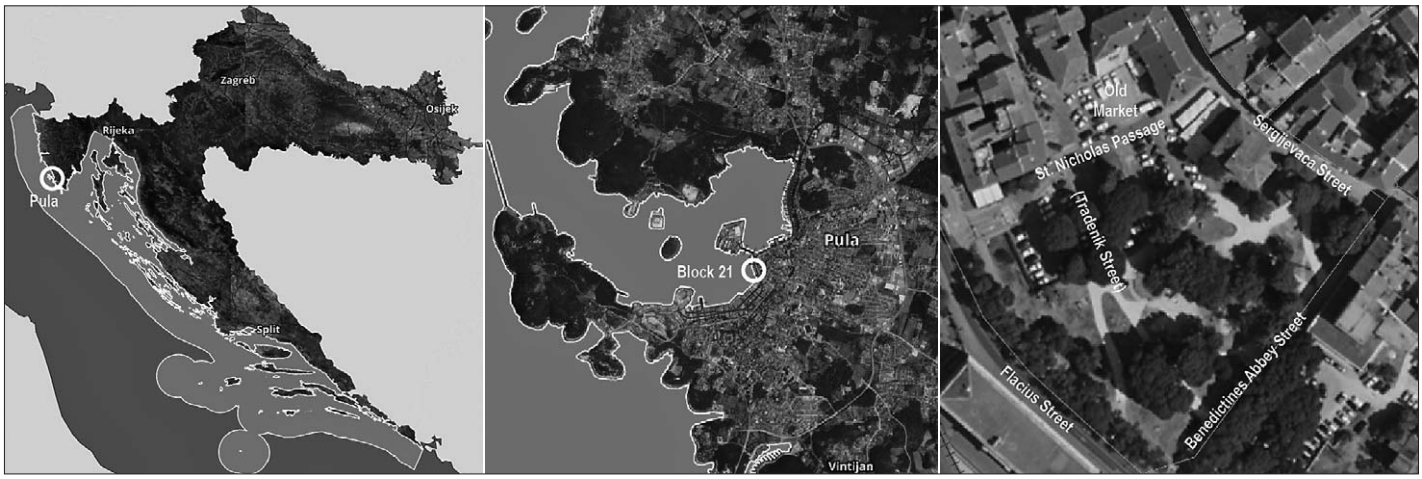


Fig. 2 Block 21 location

able qualities relevant to considering possible scenarios for the future development of the Block 21 area. In the final section, the article proposes considerations for the future presentation, integration, and conservation of this significant yet under-explored part of Pula's urban core.

Previous Research

The spatial and urban development of Pula has been examined extensively; however, Park Graz (Block 21) remains comparatively under-documented. Existing knowledge derives primarily from discrete, rescue-oriented

Table 1 List of previous archaeological research

Year	Location/Title	Source	Findings / Results
1875	Church of St. Nicholas	City of Pula, Administrative Department for Urban Planning, Investments and Strategic Projects, Urban Planning Section	Layout documentation
1953 1954	Church of St. Nicholas	Marušić, 1956.; Marušić, 1967.; Meder, 2003.; City of Pula, Administrative Department for Urban Planning, Investments and Strategic Projects, Urban Planning Section	small church with polygonal apse, massive building with square floor plan, well, cistern, ancient wall; "luxurious polychrome mosaic" (Meder, 2003: 64)
	Block 21 area 1st location	Mlakar, 1957.; Meder, 2003.; City of Pula, Administrative Department for Urban Planning, Investments and Strategic Projects, Urban Planning Section	ancient building remains, a round column fragment, foundations of an unusual ancient building, stone slabs, sidewalk
	Block 21 area 2nd location	Mlakar, 1957.; Grad Pula, City of Pula, Administrative Department for Urban Planning, Investments and Strategic Projects, Urban Planning Section	ancient building, mosaic surface (open atrium centre), monolithic stone slab with a circular opening in the middle; the largest mosaic surface in Pula (Meder, 2003: 54)
1972	Block 21 immediate vicinity	Archaeological Museum of Istria, 1972.	Roman sidewalk (Sergijevaca Street and Benedictines Abbey Street intersection); Ancient building remains – a wall (presumably the foundations of a Roman building, which stood on the edge of the forum of Roman Pula)
2010	Archaeological supervision of public lighting construction works	Archaeological Museum of Istria, 2010.	a piece of carved stone (made of two broken pieces) has been interpreted as a spolia taken from the ground
2012	Archaeological supervision during canal excavation	Archaeological Museum of Istria, 2012.	stone blocks (four collected); marble tiles fragments (one was profiled) towards St. Nicholas Passage
2016	Archaeological survey in the southeastern part of the block	Arheo TiM d.o.o., 2016.; Barada, 2017: 439-440.	walls and a furnace (17th-19th century), the eastern foundations of a building (second half of the 19th century) that formed the facade facing Flacius Street; steps and an ancient sidewalk

studies rather than from a coherent, site-specific research program.

The first recorded archaeological research took place in the second half of the 19th century when the Church of St. Nicholas was documented (architectural survey dated 1875; N.N., 1875). Archaeological excavations of buildings and spaces destroyed by a series of airstrikes at the end od World War II continued in 1953 and 1954 (the Church of St. Nicholas and two areas in Block 21 centre), again in 1972 (the immediate vicinity of Block 21), and finally several archaeological surveillances and evaluation trenches were undertaken in the 21st century. The basic data and results are presented chronologically in Table I.

Conservation research of the wider historic city core-area was carried out as a preparation for the spatial planning documentation for the City of Pula, the 1992 "Implementation Urbanistic Plan "Old Town Pula".[10] In 2016, amendments to the conservation study for the General Urbanistic Plan (GUP) of the City of Pula – within the scope of the Implementation Urbanistic Plan (PUP) "Old Town" – were prepared by Bruno Nefat of Modus d.o.o. (Modus d.o.o., 2016).

Research Methods and Sources

The spatial development research of Park Graz / Block 21[11] was based on: the analysis of historical maps, old photographs and postcards; the review of relatively scarce literature (mainly conservation and archaeological research) and fieldwork, including inventories and analysis of the current urban fabric.

The primary research aim was to determine the spatial and urban development of Block 21, with a particular focus on the evolution of the green landscape – today's Park Graz. To identify features relevant for proposing future development guidelines, the historical relationship between built and unbuilt (primarily green) areas was analysed in detail, along with their fundamental compositional characteristics. Comparisons between historically significant periods for park development were interpreted and graphically presented.

Research was conducted in several archives[12] and additional documentation was collected in relevant institutions.[13] Among the collected archival material, several key maps stand out. The earliest source with a detailed green areas representation, both at the city level and the area now known as Block 21, is the Franciscan Cadastre (1820). Particularly valuable for understanding the development of open (green) spaces are the cadastral plans from 1855 and 1866 (updated in 1872). A fundamental source for the park's design analysis is the 1953 plan, based on a conceptual proposal by Zdenko Kolacio[14] from 1951.

The Area of Block 21 from the Prehistoric Period to the Beginning of the 19th Century

The development of Block 21 area, and consequently the Park Graz formation, is inextricably connected with the development of the city. Therefore, this paper provides an overview of general citywide transformations characteristic of a specific historical period, while offering a more detailed presentation and interpretation of historical sources and archival materials directly related to Block 21 / Park Graz area.

- **Prehistoric period** – **Histria hillfort settlement** – A series of archaeological research and material remains verify a continuous settlement in the area and support the widely accepted hypothesis – confirmed by numerous scholars (G. Carrara, P. Kandler, A. Gnirs (Gnirs, 2009), K. Buršić Matijašić (Buršić-Matijašić, 2007)) – that a prehistoric hillfort settlement of the Histri once occupied the central hill of Pula (Fig. 3a). Among the natural features that significantly shaped the city's spatial organisation throughout its history, it is particularly noteworthy that potable water sources were located within Block 21.

- **Ancient city** – The Roman colony of Pula was founded during the time of Julius Caesar or shortly after his death, and no later than

10 „*Provedbeni urbanistički plan (PUP) „Stari grad Pula*""

11 The article is the result of research carried out for the Conservation Study (Faculty of Architecture, Department of Architectural Heritage, 2024).

12 Croatian State Archives, State Archives in Pazin and Split, State Archives in Trieste („*Archivio di Stato di Trieste*")

13 City Library and Reading Room of Pula, Historical and Maritime Museum of Istria, Archaeological Museum of Istria, City of Pula's Administrative Department for Urban Planning, Investments and Strategic Projects – Urban Planning Section.

14 Zdenko Kolacio (1912-1987) was a Croatian architect and urban planner. He founded the Urban Planning Institute in Rijeka (1952) and later led the Zagreb Urban Planning Institute (1956-1971). He authored numerous urban plans and was awarded the Vladimir Nazor Lifetime Achievement Award in 1983. (Franic, 2009)

15 The church was repurposed into a bakery in the 19th century and was ultimatelly demolished after World War II. In 1870, it was purchased by the Venetian Marinoni family, and later by the baker Cumer, who converted the building into a residence with a bakery and bread shop on the ground floor. Although the structure survived wartime bombing, it was demolished in the 1950s (Krizmanić, 2008: 307).

the accession of Augustus (Matijašić, 1980: 33). The Hercules Gates, the oldest part of the city walls, also dates from this period. A new city was built but, unlike most planned Roman cities based on an orthogonal grid characteristic of a Roman military camp (*castrum*), the urban matrix was significantly adapted to the prehistoric settlement spatial scheme, shaped by the terrain morphological characteristics (hills).

It is assumed that "the *cardo maximus* extended from the Fontik gate along the southern Forum side, across the todays St. Francis Ascent to the castrum at the top of the hill, and further along the small Roman theatre northern edge to the Hercules Gate" (Modus d.o.o., 2016: 41-42), thus placing the *cardo maximus* within the Block 21 boundaries.

The lower part of the city (*pars inferior*) was gradually filled with multi-apartment housing. Block 21, located near the city walls, was likely built up during this period (Fig. 3b). Its proximity to the Forum (in its original form) and the presence of a local drinking water source suggest that the built environment in this area may have been of higher status – "*luxury urban villas are also being built*" (Modus d.o.o., 2016: 41). This is further supported by archaeological finds, such as mosaic flooring within Block 21, and the famous mosaic „*The Punishment of Dirke*" discovered in the adjacent block. Such elite architecture was typically accompanied by correspondingly sophisticated landscape design. However, based on the available data, no conclusions can be drawn about the parcelling, let alone the actual landscape characteristics.

• **Late Ancient and Byzantine city** – The period from the late 4th century to the end of the 8th century did not bring radical changes to the urban matrix. At the beginning of this period, the city walls were reinforced in response to barbarian threats. The upper part of the city (*pars superiori*), previously characterized by luxurious villas, was restructured into an area with multi-residential insulas.

Following the spread of Christianity and the incorporation of Istria and Pula into the Eastern Roman (Byzantine) Empire in 538 (Marušić, 1967: 20), existing Roman sacral buildings were transformed and new Christian churches were constructed. These were mostly interpolated into the existing urban fabric without disrupting the existing street network (Fig. 3c). In the immediate vicinity of Block 21, Archbishop Maximilian of Ravenna built the monastery and church of St. Mary Formosa, a magnificent basilica with two cruciform side chapels, one of which is fully preserved today (Matijašić, 2005: 40). At the northern edge of Block 21 (St. Nicholas Passage and Sergijevaca Street intersection), the Church of St. Nicholas[15] was built. A typical Istrian church of the Ravenna type from the Justinian period, with a polygonal apse. Its west-east orientation introduced a new diagonal axis into the assumed radial block structure. No relevant information has been found regarding the landscape surrounding the church or any other part of Block 21 during this period.

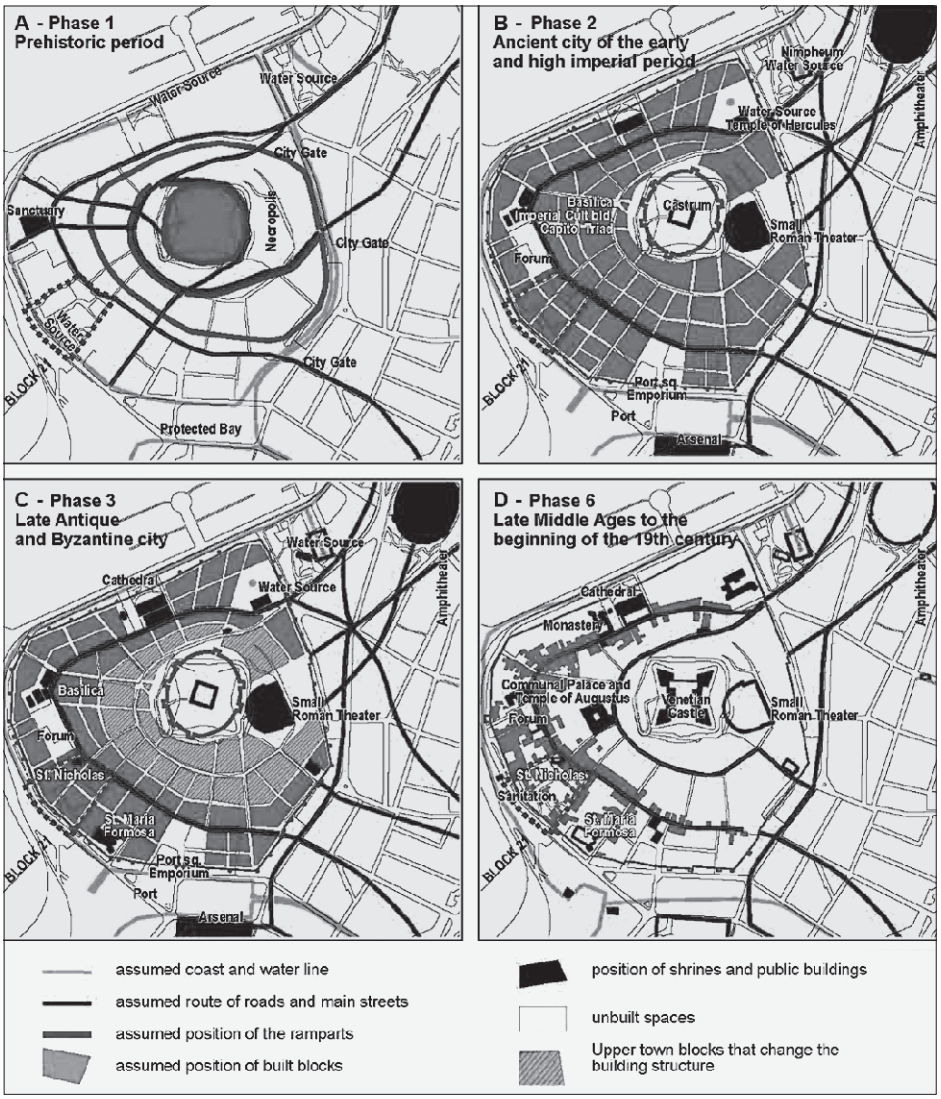


Fig. 3 Block 21 – Spatial development:
a) 1st phase – Prehistoric period;
b) 2nd phase – Ancient city of the early and high imperial period;
c) 3rd phase – Late Ancient and Byzantine city;
d) 6th phase – Late Middle Ages to the 19th century

• **Early Middle Ages** – The period begins with the Lombard conquest of Istria and Pula in 751, followed by Frankish rule in 788, marking the gradual evolution of ancient city into a medieval urban community. Political power shifted from municipal authorities to a provincial duke supported by the Church. The decline of municipal rights and rising taxes led to impoverishment of the city and the

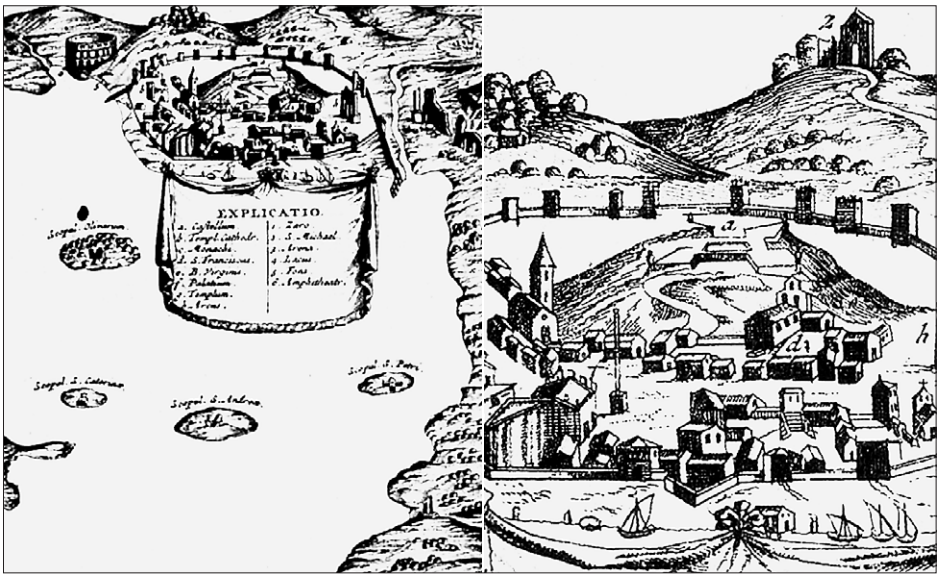


Fig. 4 View of Pula from the book by Antoine de Ville, Port and city of Pula (*Portus et urbis Polae antiquitatum, ut et thynnorum piscationis descriptio curiosa*), Venice, 1633

neglect of public spaces and infrastructure. Some of the late ancient lower quality residential insulas that arose in the upper part of the city (*pars superiori*) practically disappeared. Their materials, along with those from ancient public buildings, were reused as building material (*spolia*) in new, smaller-scale medieval buildings.

The city walls were rebuilt and strengthened during the 9th century. However, it remains unclear whether these changes had any direct impact on the spatial structure of today's Block 21. The transformation of the Roman Forum into smaller squares created the Old Market Square, which still exists today in the immediate vicinity of Block 21. A single-storey medieval market building, stood along the eastern side of the Old Market Square, but was demolished in 1974 for no apparent reason (Krizmanić, 2023: 337).

• **High Middle Ages** – Around 1145 Pula developed as a medieval commune. Despite political conflicts, resulting disputes and wars over the following centuries, architectural activity did not decline. During the Romanesque period (up to the late 13th century) the number of storeys in buildings increased (two and three-story houses), although their structural characteristics and typology changed only partially. During the Gothic period a medieval fortress was constructed on the site of the abandoned castrum. In the 14th century Pula developed into a prosperous medieval city with active trade and infrastructure. Its further growth was suddenly stopped by repeated plague outbreaks. At the height of its medieval power, Pula had between 5000 and 6000 inhabitants within city walls (Modus d.o.o., 2016: 47).

• **Late Middle Ages to the beginning of the 19th century** – This period is characterised by a series of Renaissance reconstructions – such as the cathedral, and the communal palace, as well as the construction of urban palaces (e.g. building 14 on the Forum, building 23 in Block 12), of which only fragments have been preserved. Despite these developments, Pula continued to suffer from the effects of depopulation.

Records from contemporaries (Fig. 4) indicate that the city fabric was significantly reduced, almost the entire *pars superiori* had disappeared and parts of the lower town were sparsely built.

Within Block 21, the Church of St. Nicholas remained visible, along with a row of houses lining the northeastern edge of the block. In contrast, the opposite side of Sergijevaca Street appeared undeveloped. This illustration does not entirely align with the city scheme presented in the 2016 Conservation Study (Fig. 3d), which shows a continuous row of houses along the north-eastern side of Sergijevaca Street. In any case, Pula was inexorably declining until the beginning of the 19th century.

The Block 21 Area on Cadastral Maps from 1820 to 1943

• **The Austrian governance period 1815-1918** – After the fall of the Republic of Venice in 1797, Pula briefly came under Habsburg control, then under Napoleonic France, and was finally reintegrated into the Habsburg Monarchy after the Vienna Congress in 1815. Upon re-establishing authority, the Habsburg administration abolished the old municipal statutes and initiated the preparation of a cadastral plan.

The first cadastral plan, dating from 1820[16] (Fig. 5) shows historical Pula urban structure before the extensive modernization that followed. At the time, the city had only 926 inhabitants, with approximately 200 buildings preserved (Krizmanić, 2005: 121). The built fabric was concentrated along the main concentric streets – Sergijevaca Street, the Forum, and Kandler Street – as well as in the southwest part of the city, where Block 21 is located. By contrast, the upper part of the city remained predominantly undeveloped. Although largely damaged, the medieval city

16 Franciscan cadastre – Original cadastral plan in 24 sheets kept in the State Archives in Split.

17 It was "demolished after 1947" (Krizmanić, 2005: 127).

18 They were "demolished after 1950" (Krizmanić, 2005: 128).

walls still define the façade facing the sea (Krizmanić, 2008b). Despite the relatively small scale of the cadastral map, green areas are numbered and their internal structure is visible. Also, surprising is the absence or poor articulation of green spaces adjacent to some of the most important buildings – the Porta Aurea (Golden Gate) from the Roman era (Fig. 5/3) as well as the cathedral renovated in the Renaissance (Fig. 5/1). In contrast, in the Block 21 area, seven larger articulated green areas (24-30) are visible with four indicated wells.

Block 21 (Fig. 9a) is defined by three streets and a coastline, and its area is divided with an additional internal street in a northwest-southeast direction (later Tradenik Street). The Church of St. Nicholas is located at its northwest corner. Within the block 42, buildings are recorded.

The block was not entirely enclosed:

– the northeastern corner remains, unbuilt featuring an articulated green space (possibly a park);

– the unbuilt part west from the church, along St. Nicholas Passage, appears as a plain green surface, unlike adjacent area that is diagonally articulated (probably a church garden);

– the southwestern section is partially built and separated from today's Flacius Street by a wall, behind which a structured green space was formed.

Most green areas are characterized by a symmetrical – axial layout, except the one adjacent to the church that is aligned to its diagonal direction. Within some areas, symbolic representations of trees are clearly visible. Due to the scale of the map, they should be interpreted as symbols, though they still indicate the presence of trees within the block at that time. Three wells are located close to the buildings, while the fourth lies at the intersection of central pathways within a green space composed of eight roughly equal rectangular fields.

The 1855 cadastral plan (Fig. 6) still does not display substantial structural changes at the city level compared to 1820. However, new landscape (green) areas emerged in all parts of the city, often exhibiting significantly more complex compositions. Particularly notable are:

– the northern coastal green areas, where orthogonal compositions (some with emphasized circular or star-shaped intersections), as well as diagonal and radial patterns (in the far northeast) are visible;

– a Baroque-style landscape composition with an elliptical central field east of the Forum (Fig. 6/2);

– a fragmented distribution with a circular central path located behind the blocks along Sergijevaca Street, northeast of the present-day Block 21.

The consolidation of sea front (Fig. 9b), and a new building[17] on the corner of Sergijevaca Street and Benedictines Abbey Street are visible. Before 1855 nine buildings were built along the coastline, five of which are located within Block 21.[18] The total number of buildings in the block increased to 59. Despite the larger plan scale, the landscape is shown in considerably less detail. Nevertheless, it is apparent that the articulated green structures within the block were simplified compared to the 1820 cadastre: the diagonally structured garden adjacent to the Church of St. Nicholas and the central well at the path intersection have disappeared.

From the landscape design perspective, the next cadastral plan from 1872 (Fig. 7) is particularly interesting, as it again, at the city level, shows a significant progress of landscape complexity. In addition to the axial and radial compositions observed so far, several more freely composed areas stand out. North of the cathedral (Fig. 7/1), an axially symmetrical park was formed, but the planting is relatively freely arranged. The largest and most complex landscape composition was formed on the former city gardens (Giardini) site along the city walls eastern edge (Fig. 7/3).

More complex landscape compositions also appear within Block 21 (Fig. 9c). The open (green) area, which probably belongs to the house at St. Nicholas Passage 3, shows a greater degree of complexity and articulation: a relatively simple orthogonal path system is enriched with five roundels. In the western part of the block, a relatively small rectangular green area is articulated by four semi-roundels. The adjacent block to the north, across St. Nicholas Passage (on the Old Market site), also has a clearly defined symmetrical landscape composition.

It should ne noted that, for the first time, a clear distinction between the coastline and the street along the southern facade of the block is documented, as well as rectilinear shoreline correction / land reclamation preceding the shipyard construction.

Cadastral plan from 1866 / 1878 (Fig. 8) shows a new representative city facade facing the sea (Krizmanić, 2005: 190) and articulated Flacius Street (*Via dell Arsenale*). The previously standing medieval city walls had been

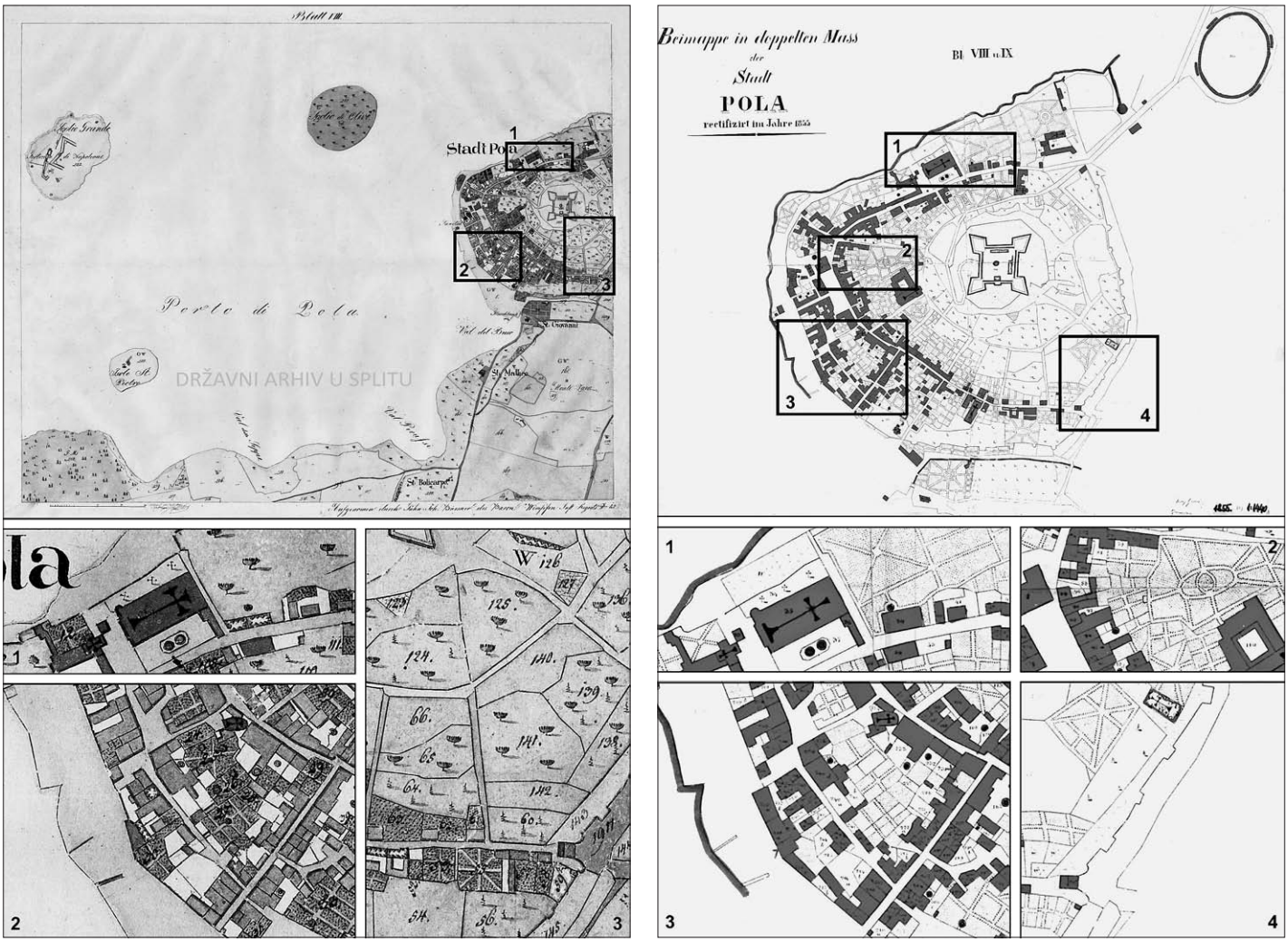


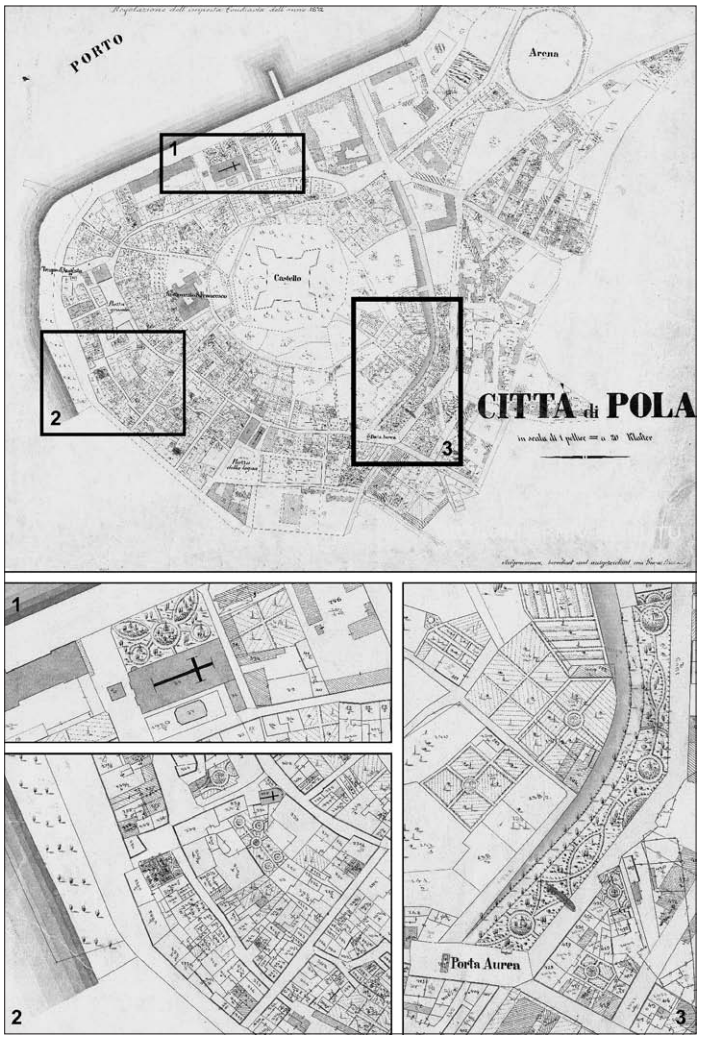
Fig. 5 Original cadastral plan from 1820 in 24 sheets. Enlarged details: 1) Cathedral, 2) Block 21, 3) *Porta Aurea*

Fig. 6 Cadastral plan from 1855 at a scale of 1:1440. Enlarged details: 1) Cathedral, 2) Baroque-style layout east from the Forum, 3) Block 21, 4) *Porta Aurea*

almost entirely replaced by large buildings that now formed a more substantial physical and visual barrier between the waterfront and the fragmented architecture of adjacent blocks – arguably more so than the medieval walls they replaced (Krizmanić, 2005: 130). This trend of edge consolidation is also evident in (two-part) Block 21. However, due to reduced graphic detail (Fig. 8/2), it is not possible to analyse possible open space transformations. In the areas in front of the cathedral (Fig. 8/1) and along Porta Aurea / Giardini (Fig. 8/3) significant layout simplifications are evident compared to 1872 cadastral plan.

The city has significantly expanded beyond the former walls' boundaries, primarily satisfying the increased needs of the Habsburg Monarchy's main military port. Along with the large development planned to the south and the arsenal construction it is, to a lesser extent, accompanied by the residential area growth along the existing traffic routes to the east and north. Consequently, Block 21 lost its original coastal position – previously situated just behind the defensive wall – and became partially separated from the sea by newly constructed military structures associated with the arsenal. During the second phase of city expansion (up to approximately 1900), rapid urban growth was accompanied by the gradual infill of emptied plots within the historical core.

A new 1898 cadastral plan, in a relatively large scale (1:1250), shows Block 21 in detail at the turn of the century (Fig. 9d). The sea façade is now entirely built up, as is the northwestern edge towards St. Nicholas Passage. The remaining block edges are predominantly closed, with occasional street niches in Tradenik Street, Benedictine Abbey Street and St. Nicholas Passage. Smaller-scale structures dominate the interior of the block, which now contains over 70 buildings, indicating a near total build-up.



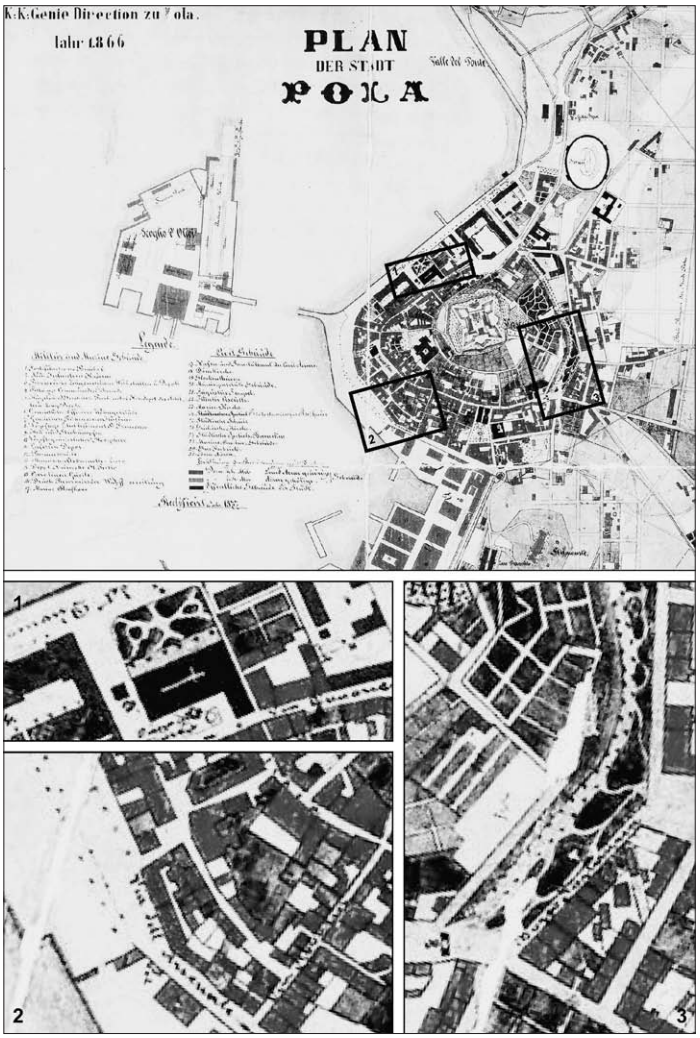


Fig. 7 Cadastral plan from 1872. Enlarged details: 1) Cathedral, 2) Block 21, 3) *Porta Aurea* / Giardini

Fig. 8 Cadastral plan from 1866 / updated 1878. Enlarged details: 1) Cathedral, 2) Block 21, 3) *Porta Aurea* / Giardini

Of particular interest is the four-part park area with a promenade and three internal transverse paths – likely belonging to the building at St. Nicholas Passage 3. Compared to the 1872 layout, this green space appears to have a significantly simplified composition.

Most of the open spaces visible in the earlier plans have been built in the meantime, and the remaining open space has been reduced to the necessary minimum courtyard space without any visible landscape composition. Wells, previously marked, are no longer visible on the plan. This intense densification covered nearly the entire area of the Roman *insula*, likely resulting in damage to any subsurface archaeological layers. Nevertheless, archaeological surveys have uncovered noteworthy remains.

• **The Italian governance period 1918-1943** – After the fall of the Austro-Hungarian Empire in 1918 and until Italy's capitulation in World War II, Pula was governed by Italian authorities. With the loss of its role as the monarchy's main war port, the city experienced another depopulation, which resulted in relatively minor interventions in the existing urban fabric.

In 1935, the City of Pula decided to develop a regulatory plan and hired the architect Luigi Lenzi, one of the *Gruppo degli urbanisti romani* (G.U.R.) founders (Jurcan, 2020: 148). The plan addressed three fundamental objectives across multiple levels: the creation of a decentralized "urban aggregate" for the wider Pula area, zoning of both the city and the port, and the "hygienic rehabilitation" of the historic city core (Jurcan, 2020: 149).

In the Block 21 area, Lenzi's regulatory plan proposed the partial demolition of buildings and expansion of Tradenik Street and St. Nicholas Passage to establish more monumental approaches toward the Forum in the west, i.e. St. Francis church and monastery in the north.

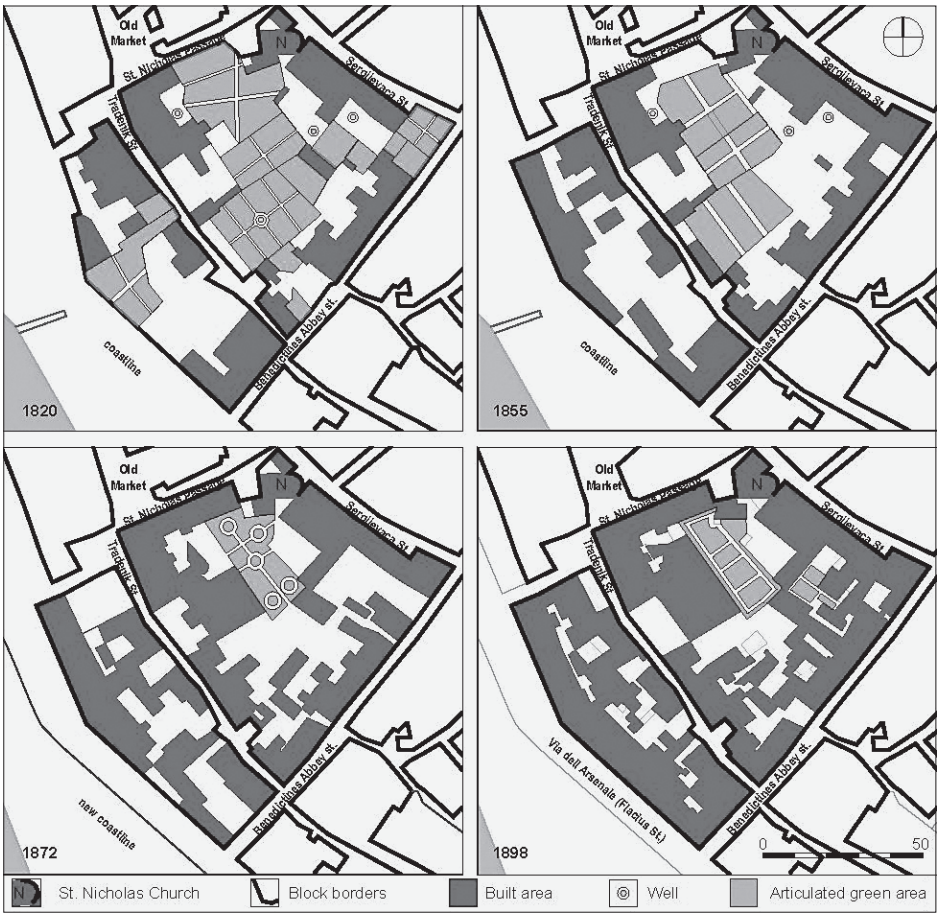


FIG. 9 BLOCK 21 – BUILT AND GREEN AREAS DEVELOPMENT: A) 1820, B) 1855, C) 1872, D) 1898

FIG. 10 BLOCKS 21 AND 22 AFTER DEMOLITION IN 1953

FORMATION AND DEVELOPMENT OF THE CITY OF GRAZ PARK IN BLOCK 21

• **World War II, bombing and initial post-war reconstruction 1943-1947** – Following the armistice signing in September 1943, German forces took over command of the city. Between January 1944 and May 1945, the city suffered heavy destruction in 23 air raids carried out by Allied forces (Marsetič, 2005: 289). Despite the low resolution, aerial photographs taken during the bombing (Fig. 11) clearly show the historic urban structure and the final state of Block 21 prior to its destruction.

Before the bombing Pula had 3225 residential buildings, 235 of which were completely demolished and 2,170 sustained varying degrees of damage (Marsetič, 2004b: 161) causing Pula's historic core to lose an important part of its heritage. Within Block 21 alone, at least 38 buildings were damaged (Marsetič, 2004a: 171-195). A large number of damaged residential buildings were removed after the war, consistent with Lenzio's pre-war regulatory plan, which aimed at "healing" the historic centre.[19] All the remaining buildings were demolished in 1952 (Marsetič, 2005: 305). The bombings radically changed the (until 1944) compact urban fabric of Pula (Ancelj, 2013: 250) and were disastrous for the western and southwestern coastal areas of the city (Fig. 12). Block 21 underwent an especially radical transformation, as a once densely built part of the city was reduced to an entirely open, unbuilt space (Fig. 10).

After the war, Pula came under the Allied Military Government, which initiated the infrastructure and public buildings reconstruction through the public works authority (*Genio Civile*), while also co-financing up to 50% of the private building reconstruction (Marsetič, 2004b: 161). By the time Pula came under the administration of Yugoslavia in 1947, most of the infrastructure and building reconstruction had been completed, and the Department for Monument Protection (*Soprintendenza ai monumenti*) undertook significant efforts to restore cultural heritage sites (Marsetič, 2005: 306).

19 Lenzio's plan was based on the tradition of the Italian school of modern conservation and the theoretical assumptions defined by the architect, conservator and conservation theorist Gustavo Giovannoni (1873-1947), whose postulates also found their place in the conclusions of the first international conservation document, the Athens Charter on the restoration of historical monuments (1931). In terms of urbanistic planning, his work "Urbanistic thinning of old centers" is particularly important (*Il 'diradamento' edilizio dei vecchi centri. Il quartiere della rinascenza a Roma*, 1913).

20 Idejna skica za regulaciju predjela od Fora do ulice Minerva u Puli – Tehnicki opis (HR-DAPA-114, GNO – PULA, 1949.-1955.)

21 "Composed hastily, without prior studies and plans, on the wrong line of planning started at the end of the 19th century." (Krizmanić, 1986: 9)

• **City of the second half of the 20th century** – The relatively successful post-war reconstruction and political integration into Yugoslavia were accompanied by a real exodus of the Italian population. By 1948, the city's population had declined to 21,065 – approximately 40% of its pre-war size. After the situation stabilized, the population grew again, creating new demands for housing and infrastructure. These needs were met to a lesser extent by the existing building stock reconstruction and to a much greater extent by new construction and interpolations.

In the second half of the 20th century, efforts were made to improve the preservation of historical values, and to guide urban development through a variety of planning and design interventions. Selected activities of particular importance are listed in Table II. Key developments related to Block 21, especially those concerning its landscape character, are briefly outlined.

In 1947, new urban regulations formally recognised the Block 21 area as "a protected part of the city of historical and artistic importance" (Article 1). Also, the Church of St. Nicholas was listed as one of the buildings "which have, either in their entirety or in their details, characteristic features worthy of preservation" (Article 2). All ruin remains were placed under protection and "any construction work on any building (even damaged and abandoned) without prior permission from the Conservation Institute in Rijeka" (Article 4) was forbidden. The Regulation envisaged comprehensive valorisation of architectural heritage and active reconstruction of the historic core – including ruin sites – but this has not been realized (Krizmanić, 1986: 9).

Following the 1951 directive[21], which focused exclusively on structures from Antiquity and the Middle Ages, extensive clearing of post-medieval ruins began. Unfortunately, the works were not accompanied by adequate archaeological research that would enable a better understanding of the urban development of the city and a more objective valorisation of Pula's architectural heritage.

All the parks in Pula created after 1947 (e.g. Park Graz, Tito's Park, King Petar Krešimir IV Park) occupied "newly created" free spaces within the densely built-up historical core. Most of the projects were designed by the Urban Planning Institute in Rijeka, according to the proposals of architects Zdenko Sila and Zdenko Kolacio and surveyor V. Karlić (Matošević, 2004: 172). "Guided by the idea of creating a 'green city', often neither in form nor in the choice of plants, the new solutions are not adapted to the spatial ambience of the Mediterranean climate" (Matošević, 2004: 172).

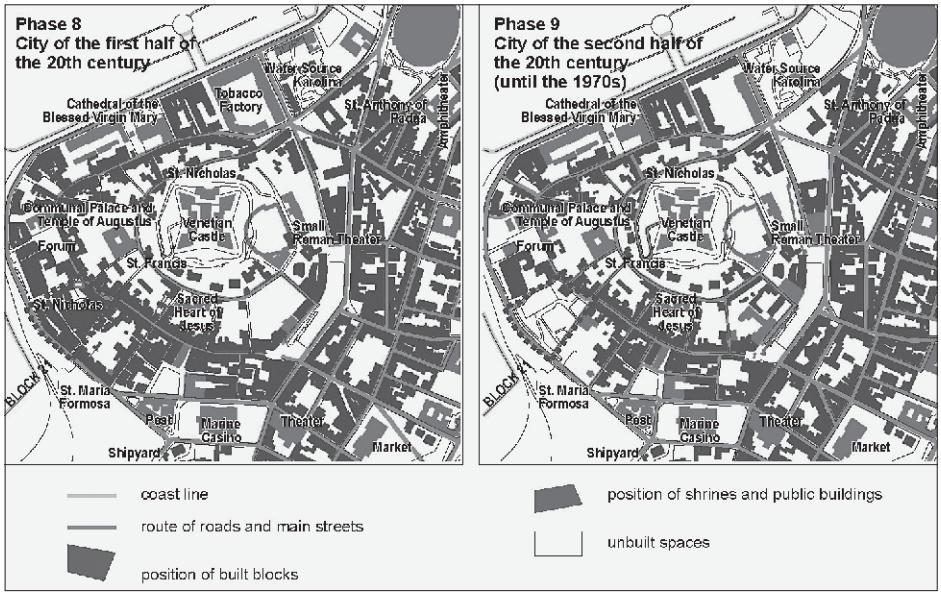


Table II Documentation list

1947	Regulations for Preservation of Antiquities in the City of Pula (City of Pula, Conservation Institute Rijeka)
1951	Remarks and proposals for the system of the Urbanistic Plan for the construction and development of the City of Pula (Archaeological Museum of Istria)
1951	Regulation Conceptual sketch of the area from Fora to Minerva Street in Pula – Technical description[20], Zdenko Kolacio (State Archive in Pazin)
1953	Development plan of area from Republic Square to Fishing Street / According to conceptual project by Zdenko Kolacio / Drawn by Vladimir Kartic (State Archive in Pazin)
1960	Proposal for the establishment of an Archaeological Park in Block 22
1966	General Urbanistic Plan – City of Pula
1983	General Urbanistic Plan – City of Pula
1992	Implementation Urbanistic Plan "Old Town of Pula"

Fig. 11 Allied bombing of Pula in 1944. Enlarged detail with indication of Block 21.

Fig. 12 Block 21 – Spatial development: a) 8th phase – City of the first half of the 20th century; b) 9th phase – City of the second half of the 20th century

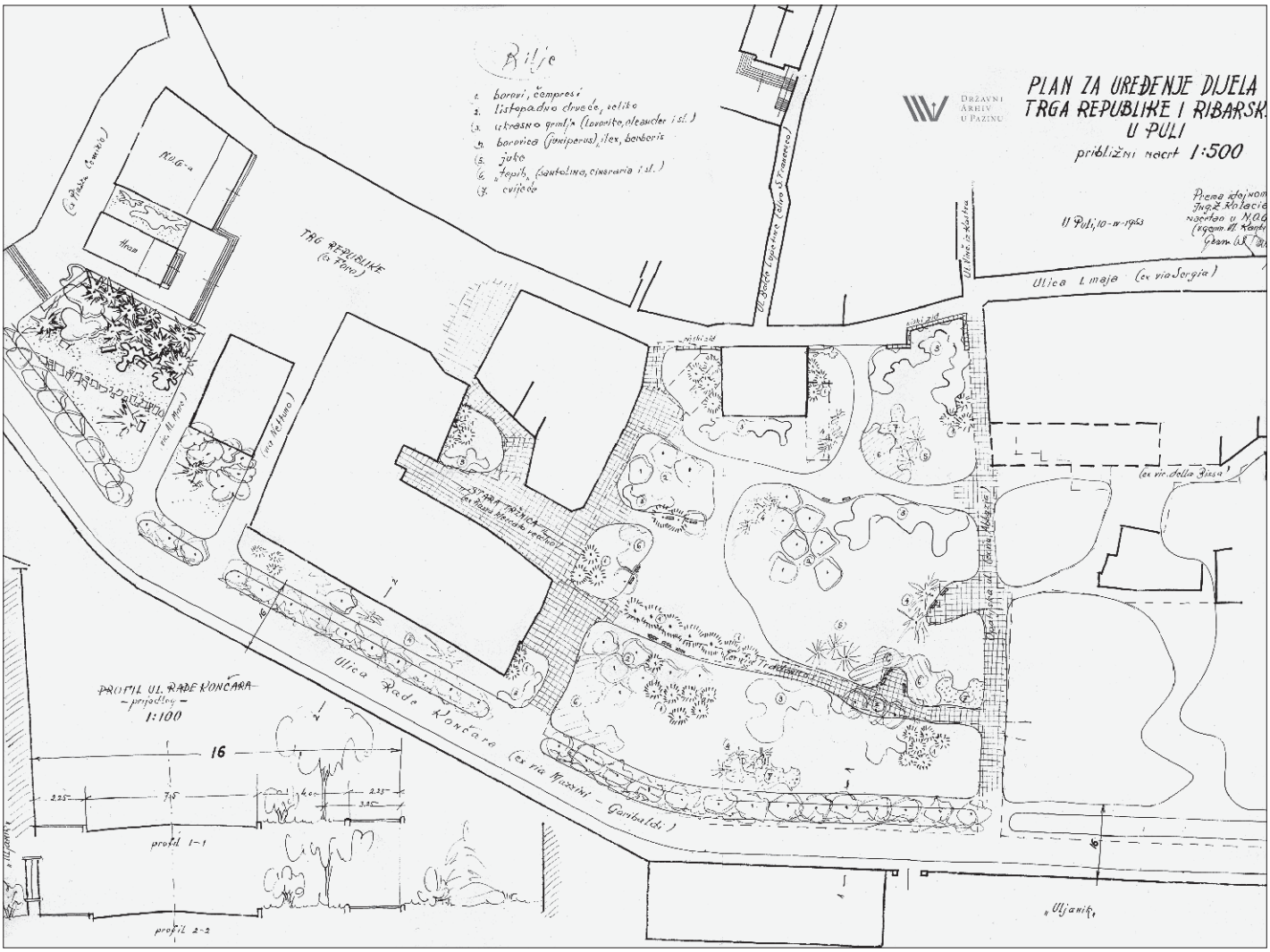


FIG. 13 DEVELOPMENT PLAN OF AREA FROM REPUBLIC SQUARE TO FISHING STREET / ACCORDING TO CONCEPTUAL PROJECT BY ZDENKO KOLACIO / DRAWN BY VLADIMIR KARTIĆ, 1953

In 1951, Zdenko Kolacio made the Regulation conceptual sketch – Fora to Minerva Street area in Pula. He was dealing with the problem of urban interpretation of the ruined part of the city and mostly refers to the Block 21 area. Kolacio sees this area as a park "revived by three smaller pavilions that will give the desired attractiveness that this public area needs due to its eccentric position in relation to the busiest areas of the city today". Kolacio argues this idea with the need to create a green area due to the lack of such spaces nearby, on the one hand, and on the other hand, sees this area as compensation for the lack of contact with the sea due to the industry proximity. The same author also emphasizes the need for additional articulation of the St. Nicholas Passage (cardo maximus) and its relationship to the Old Market, as well as the articulation of Sergijevaca Street (*decumanus*) and its connection with the Forum, to a lesser extent by new construction, and to a significantly greater extent by the creation of the new (green) park area. He predicted all of this in what was historically one of the most built-up areas of the city! It can be said that the idea was largely implemented with the realization of the Park Graz.

The proposed new corner block (at the intersection of Benedictines Abbey Street and Sergijevaca Street), the pavilion in St. Nicholas Passage, as well as the three smaller pavilions within the park, were not built.

The landscape (realized) part of the proposal is shown in the 1953 Urban Development Plan (Fig. 13). In this Plan landscape design was used as a means of spatial articulation beyond Block 21, all the way to the area west of the Augustus Temple. As a result, the once

22 As was discovered, that bakery was actually the profaned St. Nicholas church (Regan, Nadilo, 2010: 342).

densely and continuously built street area, bordered on one side by the construction of Uljanik (closed-type use), and on the other side by buildings with highly urban, open-to-the-citizen facilities, became (and remains) a road between Uljanik and the park, which can be clearly seen in the comparative photograph of the same area before the bombing and today (Fig. 14).

The proposed park concept is characterized by a free path composition, mostly organically designed while maintaining the basic direction, approximate form and position of the historic Tradenik Street. The path (Tradenik Street) direction is emphasised by two tree lines which are, along with the one beside Flacius Street, the only formal tree arrangements within the park. The intention was meant to separate the historically existing pathway from the new (approximately parallel) one. These two pathways articulate the space into three zones of similar dimensions. A larger (probably gravel) plateau (children's playground?) was formed in the central zone. Freely arranged plant groups are placed throughout the park.

Based on Kolacio's project, the remains of the buildings bombed in WWII were demolished in 1953 and 1954. In Block 21, only one house remained, while about sixty others were removed (Ancelj, 2013: 29). Archaeological excavations followed in Block 21 central area and the Church of St. Nicholas.[22]

• **Urbanistic and spatial plans of the second half of the 20th century** – The first two General Urbanistic Plans of the City of Pula (1966 and 1983) did not consider preservation and development guidelines for Block 21 in detail. However, the tendency of "filling the missing blocks with green areas (it is difficult to talk about meaningful park design)" (Modus d.o.o., 2016) most certainly refers to Block 21 area. In the late 1980s and early 1990s, despite the process of gaining independence and the duration of the Homeland War, a series of significant residential and commercial building interpolations occurred along Kandler Street and Sergijevaca Street. The Block 21 area was systematically elaborated by the 1992 Implementation Urbanistic Plan "Old Town Pula". Along with richly elaborated analytical maps, the plan provided a series of guidelines for a comprehensive system of the city's core preservation and reconstruction.

As a preparation for the plan, a proposal for the interpretation of possible construction in Block 21 was made by architect Goran Detelić (Fig. 15) in 1991. He envisaged a semi-open block construction with significant closures along all roads, reduced depth (approximately to the historic inner Tradenik Street), a park inside the block and a wider green zone towards Flacius Street.

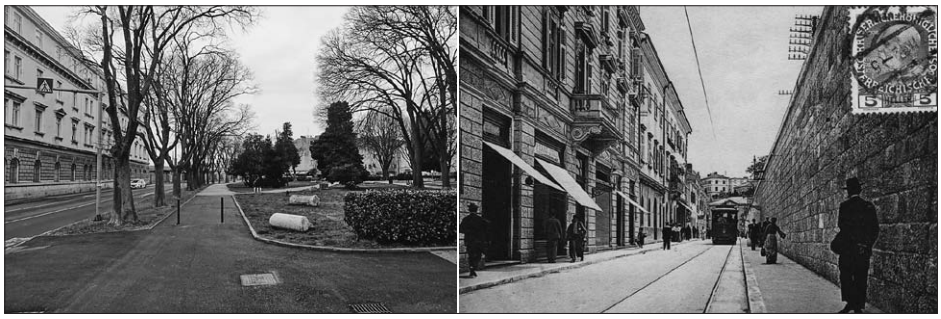


Fig. 14 Block 21 – Flacius Street: a) Panorama in 2024, b) Before the bombing (opposite view)

Critically, it can be said that this interpretation respects the historical two-part block nature. The southwestern part of the block is envisaged as a predominantly park area, built only along the former Tradenik Street (in accordance with Kolacio's idea of compensating for the lack of contact with the sea) and the northeastern, larger part of the block, as a semi-open block with a park in the center. Buildings height, as well as the significant parcelling fragmentation, differ from the buildings format from the period before the bombing. In 2006, the Pula City Council unanimously adopted amendments to the Implementation Urbanistic Plan (PUP) which prohibited construction on green areas within the historic core (Ujčić, 2021: 54).

• **The city at the end of the 20th century and the beginning of the 21st century** – The beginning of the 21st century was marked by new interpolations into the city's fabric, sig-

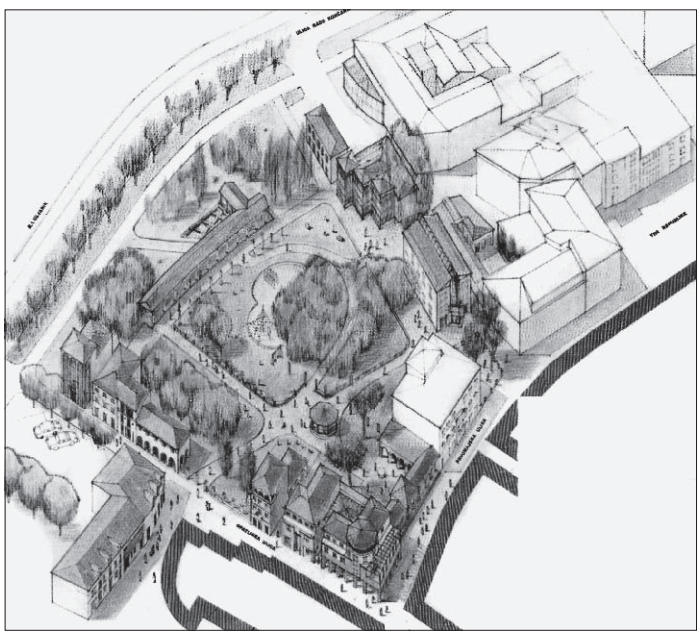


Fig. 15 Interpretation of possible new construction in the Graz City Park by Goran Detelić, 1991

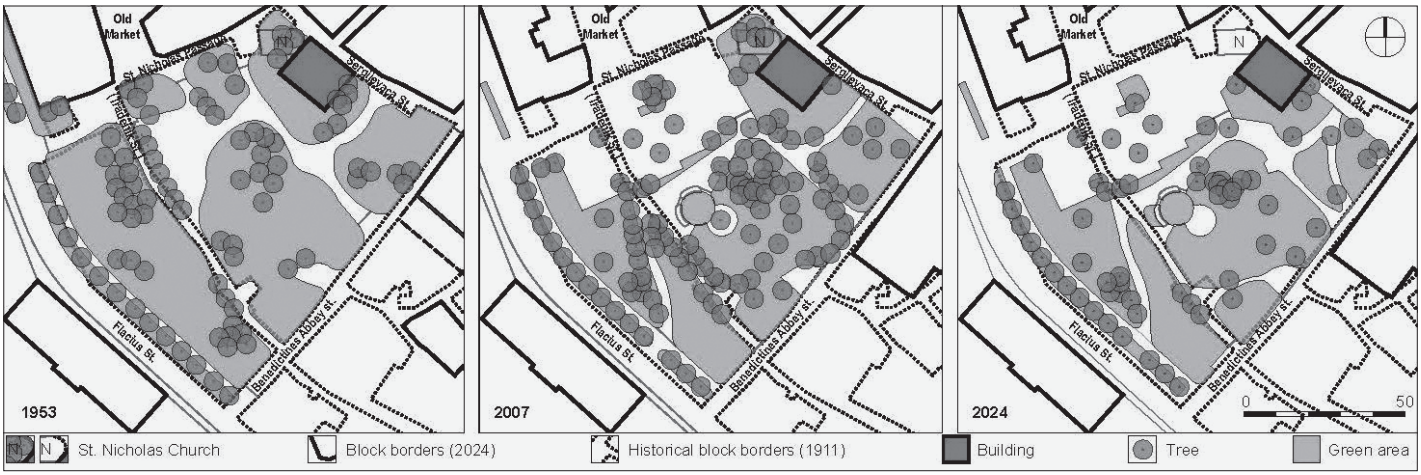


FIG. 16 GRAZ CITY PARK LAYOUT SCHEME: A) 1953, B) 2007, C) 2024

nificant public buildings (e.g. Museum of Contemporary Art of Istria, City Library), paving reconstruction and archaeological research of the Forum (with significant new Ancient and Middle Age findings), and the Riva and Flacius Street reconstruction. As for Block 21, it can be stated that no changes were registered in the reconstruction, nor in maintaining Park Graz.

In 2016 (Modus d.o.o.), the architectural heritage was evaluated and identification sheets of blocks and individual buildings were created, representing a significant foundation for a new approach to protection and interpretation of architectural heritage systematically, also reviewing the current state and previous approaches. Block 21 (and the only remaining building) is evaluated as category A1[23] „due to its exceptional position in the city's urban matrix and potentially important archaeological findings". For the entire Block 21 area additional archaeological research was prescribed and only necessary maintenance works were allowed (parking and partially green areas).

THE CITY OF GRAZ PARK TODAY

The current park layout originates from Kolacio's original idea from 1953 but has been repeatedly modified over the past 70 years. In this chapter the existing state is described in detail and compared with the 2007 situation and the original 1953 idea.

Today, Block 21 (Fig. 16c) is divided into two clearly defined parts – Park Graz (two-thirds) and a parking area (one-third). The only preserved building is located at the northeastern edge. Park composition is poorly legible and just a few somewhat articulated elements stand out: the double circular motif and children's playground, a tree line along Flacius Street, the tree line remains (three trees) along the main pathway (Tradenik Street) and a larger tree group in the central zone. Pathway system has changed over time, and today, no logical hierarchy can be recognized in relation to their spatial significance. Historical Tradenik Street is roughly visible only as a pedestrian connection through the park (Fig. 17).

FIG. 17 VIEW OF TRADENIK STREET: A) HISTORICAL POSTCARD B) 2024

Archaeological stone fragment groups of different origins (mostly from the Roman period), varying levels of completeness and preservation are presented on the lawn at 17 micro-locations. This exhibition is probably a result of the 1960s idea to establish an Archaeological Park in Block 22. Besides already mentioned green elements, freely arranged smaller groups, solitary trees and

23 According to Modus (2016): Evaluation category – D.2. Outstanding monumental value of wider regional and national significance (A1): Buildings or building complexes of outstanding monumental value of wider regional and national significance, which must be absolutely preserved and restored using scientific methods and conservation principles, and where only demolition of inadequate contemporary additions is permitted.

hedges can be found throughout the park. A quite rich vegetation includes: eleven tree species (*Celtis australis* L., *Quercus ilex* L., and *Cupressus sempervirens* L. are most frequent), 61 trees (85% mature and old trees) and a large number of shrubs (Fakultet šumarstva i drvne tehnologije, 2024). The qualitative and quantitative analysis showed a surprisingly high proportion of very high-quality trees (47.6%) and a relatively small proportion of trees that need to be removed (16.4%) (Fakultet šumarstva i drvne tehnologije, 2024). The reason for such good quality vegetation could be the relatively protected park position (damage caused by salinity is not visible), on the one hand, and on the other, the existence of underground water. Four wells were historically documented in this area and even though there are no visible traces of their existence, groundwater appears at relatively shallow depths (it was generally assumed to be of marine origin, but presented research results, cast doubt on this claim).

In the existing park composition, significant deviations in relation to the original 1953 (Fig. 16a) are evident, and some are already visible in 2007 (Fig. 16b):

– a green area reduction (a parking area with solitary and tree groups in the northwest part);

– two new circular motifs in the central zone (partially within a larger triangular surface);

– a new path diagonal to Tradenik Street connecting the parking and Flacius Street (diminished its symbolic connection with the historical matrix).

Additional changes after 2007 include:

– considerable degeneration of pathway system (in terms of their exact articulation and their number);

– further fragmentation of green area (new pathways)

The planting concept is unrecognizable since it has been modified substantially since 1953:

– new tree lines (2007) along three pathways including a double one along former Tradenik Street as an attempt to further emphasize its historical significance (was not successful and only three trees remained in 2024);

– nearly linear tree formation in the central green area, perpendicular to Tradenik Street (2007) does not exist today;

– general severe reduction of solitary and tree groups.

Fig. 18 Composite map

It can be assumed that some of the trees have been damaged in the meantime by "frequent windbreaks" that "are the result of poorly constructed subsoil and the wrong choice of plant species" (Matošević, 2004: 172). The current state of the park does not reflect the importance that this space could, and arguably should, have within the protected historic core of the city. In its present form, the park lacks a coherent composition and does not embody significant artistic value. Nevertheless, its ecological role within the relatively dense urban fabric is not negligible.

Discussion

The composite map (Fig. 18) overlaying key details from different historical periods can provide a foundation for considering the future planning of Block 21.

The archaeological findings layer (covering a negligible part of the block area) clearly reveals a recurring presence of material remains of various periods and significance and along previously investigated lines. When overlayed with the maximum construc-

tion area, it becomes evident that Roman era remains are found even in areas that remained unbuilt until the 19th century. Also, it should be noted that the most significant discovery (Table I, 1953/1954) was made precisely at a site recorded as developed in 1872 and 1898 cadastral plans.

The nature of these significant finds (e.g. mosaics), along with discoveries in the adjacent Block 22 (e.g. „*The Punishment of Dirke*"), contradicts the generally accepted view that the 'lower town' (*pars inferior*) in Roman cities, including Pula, was predominantly occupied by lower-standard residential insulae. These findings, together with the proximity of the Forum and the presence of drinking water sources (documented wells in the 19th century) near the coastline, support the hypothesis that higher-status architecture was located in this area during Roman period. This raises the question about the extent to which later block-based development corresponds with underlying Roman urban fabric.

Given this context, any future intervention should begin with comprehensive archaeological investigations. The fact that the area is currently undeveloped allows for such investigations to be conducted systematically, without disruption, to existing structures. This is particularly pertinent considering the valuable Roman and medieval valuable remains were discovered within Block 21 and Block 22.

Until the 19th century, Block 21 was defined by its exclusive coastal position and contact with the sea (although largely behind the city walls). This connection was severed through coastline reclamation and shipyard construction. Over the course of 80 years in the 19th century (Fig. 9), progressive infill along street frontages (including the closure of block corners), alongside a continuous increase in built density. This process was accompanied by the reduction of green spaces and their disconnection from the streets. The complexity of spatial articulation fluctuated significantly over time, reflecting alternating phases between growth and decline. The state of maximum built density prior to wartime bombing does not necessarily signify the peak in development, but rather a certain degree of degradation.

The current condition – an open park – is a relatively recent phenomenon, emerging only after the destruction caused by World War II bombings, the subsequent clearance of ruins, and the landscaping efforts of the 1950s. As such, the park represents a break in continuity within the city's collective memory. The transformation of the original 1953 park idea is documented through several phases (Fig. 16), but the underlying causes of the present condition are best understood through the composite map. It reveals that most of the thriving trees today are concentrated in areas that remained undeveloped (1898) or along its edges. An exception is the tree row along Flacius Street, where it is evident that the removal of all underground structures from previous construction was consistently implemented. Additionally, the documented presence of wells/sources/underground waters, has undoubtedly significantly contributed to the relatively high quality of the existing vegetation.

In general, it can be concluded that present vegetation composition is more a result of objective (unfavourable and favourable) circumstances of the planting micro locations than of any deliberate compositional effort. It can also be assumed that previous unsuccessful plantings have very likely left their mark in almost all parts of the block on archaeological remains from all earlier periods. Recorded archaeological remains are found both beneath 19th and early 20th century buildings and partly within the then unbuilt areas.

Established and assumed differences in the block structure throughout history today raise questions regarding the future articulation of this important space in the very centre of the modern city. This problem has also been recognized in urban planning regulations. According to current building conditions for Block 21, areas outside the buildable zones are subject to mandatory additional research – archaeological, historical, urban, and conservation-related – prior to any further development. Such investigations will form the basis for evaluating the location and, where appropriate, for reconstructing the historical urban matrix through typological interpolation or reconstruction / reinterpretation. Importantly, any future construction is subject to the outcome of an urban-architectural competition. Until such a process is completed, only maintenance interventions are permitted.

Conclusion

The historical and spatial evolution of Block 21 – today the biggest part is occupied by the City of Graz Park – offers a unique insight into the layered urban development of Pula. From its ancient origins and dense historical fabric to its transformation into a green space after World War II, the block reflects key moments of continuity, destruction, and reinterpretation.

If the City of Graz Park is considered primarily as a realized landscape concept based on Kolacio's 1953 vision, it is important to note that the original idea of a unified green space, acting as a buffer zone between the city and the industrial complex along Flacius Street, has been significantly compromised. The insertion of parking areas and the gradual erosion of landscape elements have diminished both its spatial clarity and symbolic intent.

Alternatively, if Block 21 is viewed as a historically dense, two-part urban block – divided by the former Tradenik Street and positioned between the Forum, the Old Market, and Sergijevaca Street – the absence of any meaningful reconstruction (apart from one preserved building) fails to support the role this space historically held within the city structure. In particular, the lack of defined urban fronts toward Sergijevaca Street and the Old Market diminishes the spatial character and public value of these prominent areas.

This issue was previously acknowledged in proposals by Goran Detelić (1991) and the Implementation Urbanistic Plan "Old Town of Pula" (1992), both of which offered valuable ideas that remain unrealised. These concepts contain qualities, such as the balance between open space and architectural definition, that should be seriously reconsidered in shaping the future vision for Block 21.

The exceptional historical layering of Block 21 positions it as a valuable test ground for integral conservation, whereby historical urban memory, archaeological heritage and contemporary design can interact productively. Rather than privileging either preservation or development, the future of this space should be shaped through rigorous interdisciplinary research and competition-based design processes.

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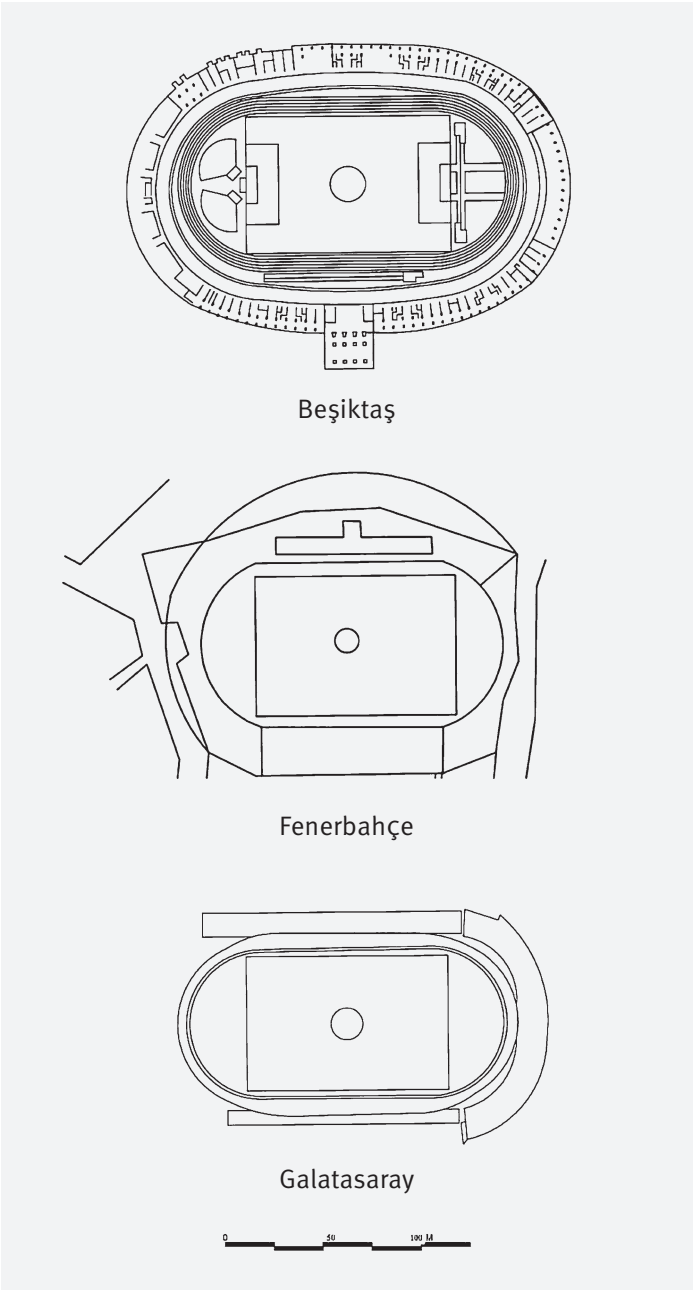

Fig. 1 Plan of Beşiktaş, Fenerbahçe, and Galatasaray

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Modernity and the Development of First-Generation Stadiums in Turkey

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Sports Architecture
Stadiums
Paolo Vietti-Violi
Republican period
Turkey

The first generation of modern stadiums was constructed during the early urbanization process of the Republic of Turkey, particularly with the contributions of Italian architect Paolo Vietti-Violi. These stadiums transformed both the physical environment and social identity, serving as some of the earliest examples of modern architecture. Accordingly, the first-generation stadiums from the early Republican era were designed using modern architectural principles and spatial representations of Republican ideology, aiming to cultivate a modern, secular, and healthy society. In this sense, the study aims to reveal the effects of design decisions on the physical quality of space and the ways these spaces have transformed into tools for building a modern nation by examining the historical context, architectural components, and social impacts of the stadiums in question together. The study method involved an in-depth evaluation of all historical sources and materials to find out how the first generation of stadiums developed and shed light on socio-political influences. The study will reveal the aesthetic ideals of the time, focusing on design elements, materials, and the spatial organisation of the stadiums, as well as their social and cultural impact in producing a modern, secular, and healthy nation.

Introduction

Many scholars hold the view that the stadium is a huge theatre in that it displays outstanding accomplishments. It is an interplay of dramatic function and monumental scale that results in significant civic architecture (Jonh, et al., 2013) The stadia and hippodromes of Ancient Greece served as the first examples of modern sports facilities, hosting Olympic and other sporting events. After Christianity spread across Europe, sports facilities inherited from the Roman era received less focus, while the construction of churches became increasingly popular during the Medieval period. The intention to participate in sports returned to public life around the 14th century. Unlike the Greek and Roman eras, cities primarily constructed temporary platforms and spectator areas from timber, rather than permanent structures (Yaroni, 2012).

In the nineteenth century, stadiums experienced a resurgence as a building type, driven by the developments of the Industrial Revolution. The advancement in structural technologies during the Industrial Revolution enabled the construction of stadiums. Larger and more durable stadiums were made possible by these technological advancements, allowing for greater numbers of spectators. In the late nineteenth century, Baron Pierre de Coubertin pointed out the rebirth of the Olympic heritage at a conference. This impetus resulted in the first modern Olympic Games being held in Athens in 1896. Accordingly, German architect and archaeologist Ernst Ziller restored the ancient Greek stadium to hold the first modern Olympic Games in 1896. The stadium had a unique elongated U-shape, with marble terraces accommodating approximately 50,000 spectators (Fig. 2).

In 1908, James Fulton designed the White City Stadium for events supporting various individual sports, encompassed by a cycling track. "It was a functional building, with a steel frame, accommodating over 80,000 spectators – the first purpose-designed modern Olympic stadium." (Jonh, et al., 2013). The socioeconomic principles underlying the organization of the capitalist mode of production, whether in the industrial, Fordist, or modern periods, have significantly influenced the architectural and economic development of football stadiums. As the initial modern stadiums emerged in the United Kingdom, they displayed the principles and essential sporting elements of that time and later influenced developments in other countries (Paramio, et al., 2008). John Bale (2003) points out that industrialization in Western countries enabled the spread of football, its stadiums, and the evolution of modern stadium architecture everywhere.

As stated in the beginning, stadiums are essentially large entertainment venues that need to be as pleasurable to visit as a cinema, opera house, or theatre. They should be considered social and cultural landmarks in the communities in which they are located. The Colosseum in Ancient Rome functioned as the first stadium model, playing an essential role in the civic life of its city. It featured a sophisticated architectural design, where the integration of seating tiers, ramps, or stairs, and expansive roof structures into a cohesive and captivating aesthetic vision was based on an oval plan. The dominant building technologies of the period were converted into valued architectural forms. The colonnaded walkways on the outer walls connect the building's size to the human scale. This remarkable and innovative façade became a major source of inspiration for Renaissance builders 14 centuries later (Jonh, et al., 2013). Thereupon, in stadiums, design achievements were reached when the structure and enclosure worked together to express a single idea.

A stadium, more than any other type of building in history, has had a unique ability to shape the identity of a town or city. The stadium has the potential to elevate a community's profile, creating a distinct character and serving as an important component within the built environment. Stadiums are among the most observable buildings throughout history, capable of transforming lives and embody-

ing a nation's pride and ambitions (Sheard, et al., 2005: 6). Thereupon, the stadium becomes a crucial architectural element for any community, serving as a significant resource in the context of urban development for a city. Stadiums function as significant venues for entertainment, comparable to cinemas, opera houses, and theatres. Due to the strict functional demands of stadiums, this type of building typically exhibits a direct relationship between form and function. Their functions inherently create an introverted building type, as they tend to turn off from the surrounding built environment.

The first generation of stadiums holds significant importance in architectural and sports history in Turkey. They have been modern architectural structures that served as a notable example of cultural heritage from the early Republic period. The Italian architect Paolo Vietti-Violi played an important role in the design of the generation of stadiums in developments in modern sports architecture throughout the country. Architecture was a fundamental element of the visual culture of Turkish modernism, wherein Republican modernist architects endeavoured to break off this culture from any association with the forms and stylistic characteristics of Ottoman roots (Bozdogan, 2001: 59). The formal and aesthetic features of modern stadiums as a building type were the embodiment of the rationalist and positivist ideals of the Republican Regime. As Korkmaz noted, the Republic's modernisation progress coincided with the construction of modern stadiums (Korkmaz, 2007).

New Architecture, Stadiums and Nation-Building

Since 1908, Ottoman revivalism has encompassed the integration of Western technology with Ottoman decorative motifs, continuing throughout the 1920s under the designation of the First National Architecture (Basa, 2015). However, the regime held a negative view of connections to the Ottoman legacy. Rather than embracing Ottoman revivalism, European modernism emerged as the dominant contemporary style by 1930 (Bozdogan, 2001). New architecture integrates philosophical, economic, historical, and socio-cultural elements to create innovative designs that align with contemporary architectural discourse (Gropius, 1965).

This shift towards European modernism not only reflected a desire to break from or continue the past but also represented a broader cultural transformation within Turkey regarding the establishment of a modern Turkish nation. The rationale behind adopting modern architecture in Turkey was that it aligned with the Republican ideology, which perceived secular modernism in architecture as a means to distance the country from its Islamic and Ottoman heritage (Bozdogan, 2001). The newly constructed modern buildings embody the ideals of the young republic. Thereupon, a significant number of European architects played an important role in the adaptation of modern architecture in Turkey. In the same vein, the new architecture was integrated in Malaysia, an Islamic country, by emphasising integrity and honesty, parallel to the people's aspiration for a democratic and righteous way of living; thereby taking heed of the development of society (Hussain, 2017). In this sense, drawing the connection between reforms and modern architecture highlights the need to replace traditional patterns with new ones, proving that architecture plays a vital role in modernisation. Stadiums as public buildings play a significant role in the development of society. For example, Otto March designed a stadium in Germany in 1913 with a capacity of 60,000 for the 1916 games (Fig. 3). The theatres and stadia of Ancient Greece served as a model for Otto March, inspiring him to design numerous stadiums in Germany. The Nazi regime had recently taken power and decided to demolish the Deutsches Stadion (1913) to build a new stadium for the Berlin Olympics. Werner March took charge of designing a new stadium (The Olympiastadion). The stadium was designed in a vast oval form that was capable of hosting 110,000 spectators. The stadium's external facade expresses the reinforced concrete columns. The stone cladding of the stadium provides an aesthetic appeal. Large-scale political demonstrations also took place in this monumental stadium (Fig. 4). This building became a symbol of the regime's power, hosting rallies that reinforced the ideological narratives of the time.

The utilisation of stadiums in the Soviet Union and Franco's Italy to advance state ideology, as well as in post-apartheid South Africa to cultivate a new national identity, represent important historical focal points (Doğan, 2024). In Rome, Mussolini established a large sports centre called Rome's Foro Mussolini. Architect Enrico Del Debbio

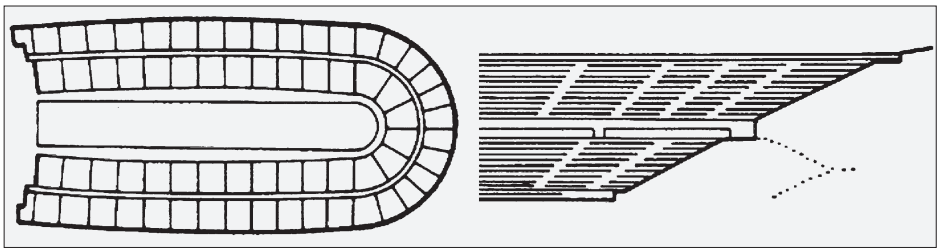


Fig. 2 U-shaped stadium in Athens from 331 BC was used for the first modern Olympic games in 1896

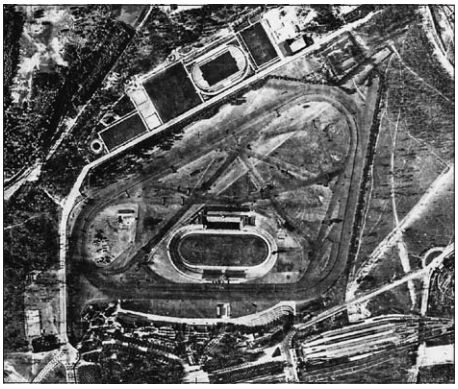


Fig. 3 View of the sports complex in Berlin included Deutsches Stadion in 1928

Fig. 4 Olympia stadion in 1936

FIG. 5 STADIO DEI CIPRESSI IN FORO MUSSOLINI

planned Stadio dei Cipressi as part of Foro Mussolini (Fig. 5). The stadium featured a classical design incorporating rationalist architectural elements, distinguished by classical symmetry and monumentality through the use of natural stone.

During the early Republican period, the construction industry encountered significant challenges due to technical limitations, a marked shortage of skilled labour for concrete construction, an inadequate supply of necessary construction equipment, and a lack of suitable materials for the process (Bozdogan, 2001). During the 1930s, Turkey was deficient in industrial resources, depending on imports of iron and steel, with a restricted number of cement factories (Aslanoğlu, 1986). Modern architecture in Turkey, despite constraints in materials and techniques, primarily incorporates contemporary methods. The construction materials that require skilled workmanship, such as roofing tiles, terracotta, and gypsum, were imported from the Soviet Union, France, Belgium, Germany, and Italy. Those that need less precise workmanship, such as steel bars, were produced in Turkey (Aslanoğlu, 1986).

Architects during the era of modernisation sought to incorporate contemporary and secular living practices into their public buildings. Among these structures, stadiums, which served as public edifices, represented the regime's ambitions for nation-building by promoting a healthy populace. This integration was not merely functional; it also aimed to create a sense of community and national pride. By designing stadiums that could host large gatherings, architects contributed to the cultural identity of the nation, fostering a collective spirit among citizens.

STUDY OBJECTIVE AND METHOD

The research methodology encompasses a thorough examination of all historical sources and materials. While official sources and materials are meticulously archived and scrutinised, informal and unofficial resources are plentiful. By integrating both types of sources, the research aims to construct a more comprehensive understanding of the historical context.

This historical study asserts that it has conducted a thorough and systematic investigation using various methodologies, areas of inquiry, and necessary levels of detail. The process involves collecting news articles, social media content, official documents, and government reports to clarify the historical context of the case. This comprehensive method enhances the understanding of how the first generation of stadiums developed. Furthermore, it sheds light on the socio-political influences that shaped their architecture and functionality, revealing how these venues served not only as sports arenas but also as focal points for community engagement and national identity. Thereupon, the objectives of this study should (1) explore the first generation of stadiums as a building type early Republican period of Turkey, (2) carry out an analysis of the stadium, which was planned by Italian architect Paolo Vietti-Violi in the early Republican period, to learn how modern architectural features were embodied in stadiums, and (3) shed light on their socio-political influences.

The research analyses the list of stadiums planned and built during the Republican period, including Beşiktaş, Galatasaray, Fenerbahçe, Adana, Bursa, and Manisa, 19 May stadiums.

The main reasons for the selection of these stadiums within the scope are:

– Historical Period and Construction Time: The selected stadiums were built in the early period of the Republic of Turkey (especially between the 1930s and 1950s) and represent the first examples of modern architecture, which were the first generation of stadiums in Turkey, reflecting modern architectural features. Sheard et al. (2005) classified modern stadiums into five generations, each representing a distinct stage in the evolutionary process of design and functionality: First generation focus on the capacity to host significant spectators. Second generation: enhancing spectator comfort and improving support amenities. Third generation prioritise safety measures and aim to mitigate anti-social behaviour. Fourth generation are designed for multiple purposes, financed through corporate sponsorship and media partnerships. Fifth generation are the driving force behind urban regeneration.

– A significant commonality among the selected stadiums is that they were designed by the Italian architect Paolo Vietti-Violi, who introduced and established contemporary design principles in Turkey. This criterion allows for formal and spatial comparisons across the structures and ensures a coherent examination of the architectural concepts underlying the design tactics employed in sports buildings during the early Republican era.

– Regional Distribution and Representation: The 19 May Stadium in Ankara stands as a symbol of the Republican Regime in the capital. The three major club stadiums in Istanbul – Beşiktaş, Galatasaray, and Fenerbahçe – highlight the diversity of users on a metro-

politan scale, distinct from the capital. Furthermore, stadiums in cities such as Adana, Bursa, and Manisa offer valuable insights into the architectural strategies that have facilitated the spread of modern sports culture across Anatolia.

– The selected stadiums serve not only as venues for sporting events but also as structures that have significantly contributed to the ideological representation of their era, being utilised for ceremonies, demonstrations, and public gatherings. They have played essential roles in the nation-building project of the newly established Republic, aimed at creating a secular, modern, healthy, and strong nation.

Accordingly, the study will focus on the first generation of stadiums in the early Republican period. Paolo Vietti-Violi, a modernist Italian architect, planned these stadiums as part of Turkey's modernisation process.

Stadiums as a Modern Building Type in the Republican Period

In this early work in Italy, architecture utilized classical styles in the design of the hippodrome to appeal to the aesthetic preferences of the aristocracy and upper middle classes. In contrast, the initial stadium projects in Turkey adopted a modern architectural style. In Turkey, the 1930s were the years that represented an era of the implementation of modern architectural forms. Modern styles, which aimed to embody the principles of modernization and national identity, shaped the architectural shift. The new capital, Ankara, required buildings that reflected the ongoing modernization process within the country. The Republican Regime viewed stadiums as institutions for cultivating a new Turkish generation (Doğan, 2024).

In the planning of new buildings, architects shifted their focus to modern forms, moving away from outdated and historicist nationalistic perspectives. Similar to the trend observed in nearly every other Western nation, architectural designs evolved into simple, flat-roofed cubes guided by the principle of function. The dominant foreign architects working in Turkey at that time were Swiss, German, or Austrian, with Paolo Vietti-Violi being the sole Italian architect (Aslanoğlu, 1990). Architect Paolo Vietti-Violi descends from a family in Crevoladossola, situated in the Ossola Valley of northern Italy, adjacent to the Swiss border. He got his architecture degree from the École Nationale Spéciale des Beaux-Arts in Paris. In 1911, together with architect Arrigo Cantoni, he participated in the international competition for the design and implementation of the San Siro Racecourse. With this project, Paolo Vietti-Violi's career as an architect of sports facilities began (Volorio, 2016).

He specialized in sports architecture and designed sports facilities in many countries. The Republican Regime invited him to the international competition in 1933 to design a stadium, hippodrome, and sports complex for Ankara. He won the competition and gained the right to implement the project. With this project, his career in Turkey began. He prepared sports facilities, racetracks, gym, and indoor swimming pool projects in İzmir, Manisa, Adana, Samsun, Trabzon, and many other cities in Turkey

Planning Modern Stadiums

Political and Social Context of Stadiums

The 19 May Stadium was the first stadium in Turkey constructed by the Republican regime. It was named the 19 May Stadium to commemorate the arrival of Mustafa Kemal Atatürk in Samsun on 19 May 1919, a significant event in the nation's history celebrated annually as the Youth and Sports Holiday of 19 May in Turkey. Accordingly, the stadiums possess substantial political and social influence in Turkish architectural and sports history, closely linked to national identity, modernisation, and the representation of the Republican regime. the newly planned capital, Ankara. Sports facilities such as these functioned as tools to foster a strong, healthy, and disciplined populace in alignment with national principles.

The stadiums of Beşiktaş, Fenerbahçe, and Galatasaray transcended the role of mere sporting venues for football. Their reflections encompassed the political aspirations of the Republican regime as well as the evolving urban-social dynamics of Istanbul, Turkey's largest and symbolically most significant city. Although Ankara was selected as the capital, Istanbul retained its cultural and symbolic significance. It served as the platform for presenting Turkey's new Republican identity. Subsequently, the regime's engagement in prominent football clubs, Beşiktaş, Fenerbahçe, and Galatasaray, as well as in sporting infrastructure, ensured that Istanbul conformed to the new national vision.

Manisa, Adana, and Bursa city stadiums reflected the regime's efforts to extend beyond Istanbul and Ankara, integrating Anatolian cities into the new national narrative. These stadiums became symbols of Republican values, representing progress, unity, and secularism, akin to other public buildings such as schools and train stations. The Republican

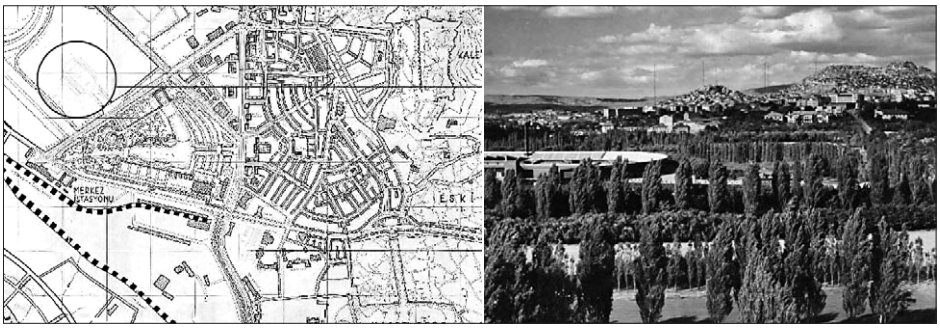


FIG. 6 INTEGRATION OF THE STADIUM INTO THE NEW URBAN PLANNING FOR THE CAPITAL, ANKARA, BY HERMANN JANSEN

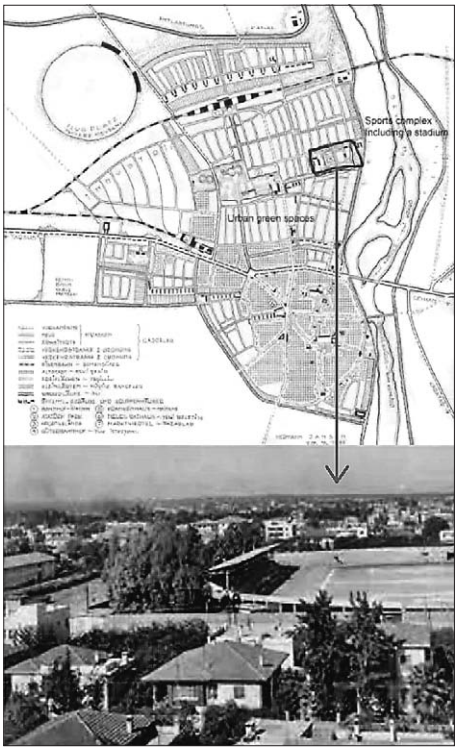


FIG. 7 URBAN PLAN OF ADANA BY HERMANN JANSEN IN 1937 AND GOOGLE EARTH 2000

FIG. 8 SPORTS STADIUM WAS PLANNED FOR MANISA CITY IN 1937

regime regarded physical education as essential for fostering strong, healthy, and disciplined citizens. The creation of these stadiums bolstered state-run initiatives such as "Halkevleri" (people's houses), which advocated for sport, culture, and education in Anatolian cities.

URBAN ANALYSIS OF STADIUMS

The Republican Regime intended to build a modern capital, which was an extension of the project of creating modern and healthy cities as part of the nation-building process. In 1924, German urban planner Carl Christoph Lörcher proposed an urban plan for Ankara. He allocated significant areas along the east-west axis for planning a sports centre. In 1927, an international competition was organised to develop a comprehensive and applicable urban plan for Ankara. German urban planner Hermann Jansen's proposal was accepted. He conceived of a stadium in the place that Lörcher allocated for sports activities. The stadium played a crucial role in shaping Ankara's initial urban identity, reflecting a political endeavour of modern Urban Fabrics (Fig. 6).

In 1937, Jansen created a comprehensive urban plan for the city of Adana. He developed a sports complex in the middle of the newly planned residential area. The plan included a stadium, four tennis courts, a basketball court, a volleyball court, a sports field, a gymnastics area, and a sports clubhouse. He connected these sports facilities to urban green spaces. The stadium evolved into a vibrant social and cultural hub within the residential neighbourhood, with physical activity becoming an integral part of daily life. Surrounding residential streets were reinforcing a walkable cityscape, providing easy pedestrian access, and fostering community identity through sports integration within the residential fabric (Fig. 7).

Unlike Ankara and Adana, an urban plan was not prepared for Manisa City. However, Manisa City Stadium was constructed at the periphery of the old city by Lütfi Krdar, who was the governor of the city in 1937 (Fig. 8). It was designed by Paolo Vietti-Violi as a component of an extensive sports complex, which featured both indoor and outdoor swimming pools, a sports stadium, a shooting range, a hippodrome, and tennis courts. It became a sophisticated sports complex in the Aegean Region, designed to serve the needs of the entire area.

For Bursa City, the French architect and planner Henri Prost prepared an urban plan in which a large area was allocated for an urban park. In 1937, Paolo Vietti-Violi planned a sports complex in an allocated area for the city's inhabitants in this urban park. The complex would have a swimming pool, a shooting range, a basketball court, tennis courts, football practice grounds, a horse-riding area, and a playground for children. This urban park was located between the old urban centre and the new urban settlement, providing vital greenery and sports spaces for residents from both areas. It served as a communal hub, fostering connections and encouraging outdoor recreational and sports activities (Fig. 9). The stadium symbolises the balance between nature and sports. The placement that respects the natural landscape ensures that the construction is in environmental harmony with the city.

In Istanbul, Papazın Çayırı was the site of the Fenerbahçe Stadium, which is currently located in Kadıköy. The stadium was integrated into the surrounding urban fabric, which includes both residential areas and public spaces (Fig. 10). The main routes that serve the neighbourhood, particularly Bağdat Avenue, are the main entrances to the stadium. Because of the low-density buildings that surround visual corridors, several stadium façades may be seen from the outside. The stadium enriches the sporting experience through its inward design, which facilitates outdoor events while simultaneously engaging with public life by fostering a connection to its surrounding urban spaces.

Similarly, the Galatasaray stadium was planned to be located in the centre of the Me-

cidiyeköy district, a significant neighbourhood in Istanbul that was undergoing rapid expansion (Fig. 11). It was encircled by a compact urban fabric of residential, office, and main arterial buildings. Due to its convenient location near the E-5 highway and the Mecidiyeköy major junction, the stadium offered excellent mobility options for both private vehicles and public transportation. The primary approach to the stadium originated from Halaskargazi and Mecidiyeköy Square in the southeast, while a secondary access route ran parallel to the E-5 line from the northeast. However, the growing spatial congestion has led to a scarcity of open public space for the stadium. Despite its constrained physical expansion options in a dense urban environment, the stadium emerged as a significant symbolic and functional focal point in this setting. Collective memory remembers the stadium not only for its architecture but also for its urban location.

These districts developed rapidly, where the stadiums became a central hub for football, fostering a sense of pride among Fenerbahçe and Galatasaray fans. In contrast to the Fenerbahçe and Galatasaray stadiums, which are situated within a district, Beşiktaş Stadium was erected in the area between the Taksim and Beşiktaş districts, near Dolmabahçe Palace and the Marmara Sea. Beşiktaş Stadium is closely linked to Istanbul's historical and natural visual corridors due to its proximity to Dolmabahçe Palace and the Bosphorus line. A coastal road leads directly to the stadium, and the building's façade that faces the Bosphorus has become an iconic feature of the cityscape. The audience is able to approach the area with a feeling of ritualism as they reach the main façade via a platform that is accessible by steps. Because of its location on the sloping ground, the stadium blends well with its surroundings.

Over time, the urban landscape of İstanbul transformed, with these stadiums influencing the spatial and social dynamics of their respective districts. New commercial enterprises emerged in Mecidiyeköy and Kadıköy, altering the adjacent neighbourhoods. Consequently, the Beşiktaş Stadium is flanked by congested thoroughfares due to its location. Over time, these stadiums evolved into symbolic representations within the city's cultural identity. They encapsulated the history of Turkish football and the intricate, evolving urban narrative of İstanbul, functioning as venues for community, competition, and identity.

Spatial Organization of Stadiums

In 1932, Vietti-Violi planned a project for a sports complex in Ankara that included a hippodrome, a stadium, and public sports facilities such as tennis courts and swimming pools. Violi designed the 19 May Stadium with a capacity of 20,000 spectators, featuring four football training fields, tennis courts, a swimming pool, a restaurant, changing facilities, and specific spaces for sports clubs beneath the stadium's structures. In 1932, the stadium was a technical and aesthetic achievement due to its compliance with both technical and economic criteria. The modern design and its functionality, which the stadium ensured, became a landmark in the capital, symbolizing progress and modernity (Doğan, 2024). Vietti-Violi's design incorporated modernist concepts, which were characterised by clean lines, functional forms, and a focus on geometric clarity. The stadium structure was seamlessly harmonised with its urban context, integrating perfectly into the surrounding urban landscape. The stadium was oval-shaped, as was characteristic of many stadiums. The primary entrance of the stadium was located at the prominent exterior façade, providing direct access to a substantial Republican lodge area, which served as a symbolic venue for ceremonies. It was situated just beneath the canopy, presumably an exclusive or elevated seating area. The ground level of the marathon stands was used as a service floor for athletes and teams to prepare for the contests. Space was carefully allocated to ensure that each team had adequate room for their equipment and strategies. Additionally, the Marathon Tower, placed at the opposite site, had a functional purpose for observation. Numerous entrances are uniformly allocated throughout the tribunes, facilitating effective crowd circulation and exit (Fig. 14). The entrance ramps and stairs have been organised on the front facade to facilitate the user's orientation to the building.

In 1937, Vietti-Violi prepared a modern stadium project for Manisa City, with the initiative of Lütfi Kırdar. The goal was to build the most advanced stadium in the Egean region to serve the entire region. The stadium's construction started in 1937 and took four years to complete. Early reports indicated that at full completion, the stadium will function as a sports complex featuring indoor and outdoor swimming pools, a shooting range, an equestrian arena, and tennis courts (Fig. 13). The ground level beneath the stand featured a service floor, which provided easy access to essential utilities and maintenance areas. The symmetrical design of the stand and seating sections directs the spectator's collective focus towards the centre field. The three main entry axes provide a ceremonial transition to the stadium, while the circulation routes are distinct and purposeful.

Fig. 9 View of the Bursa Stadium in 1948

Fig. 10 Aerial view of the Fenerbahçe Stadium

Fig. 11 Aerial view of the Galatasaray Stadium

Fig. 12 Aerial view of the Beşiktaş Stadium

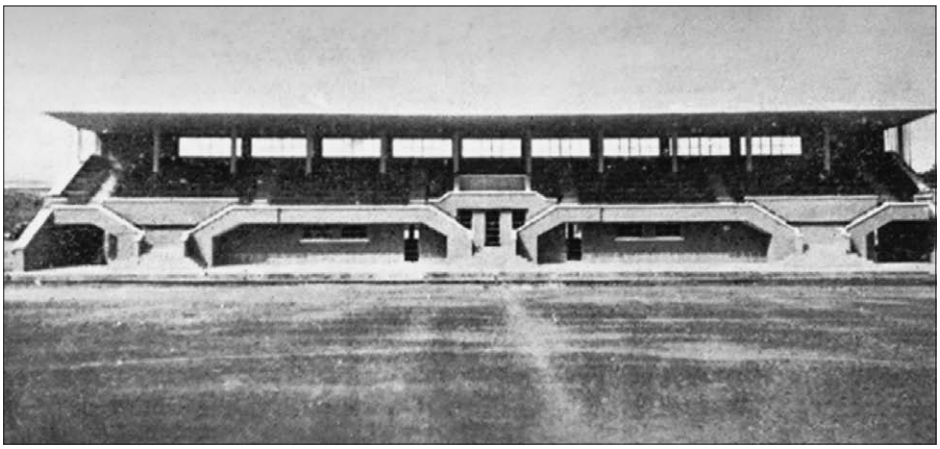


FIG. 13 VIEW OF MANISA STADIUM IN 1938

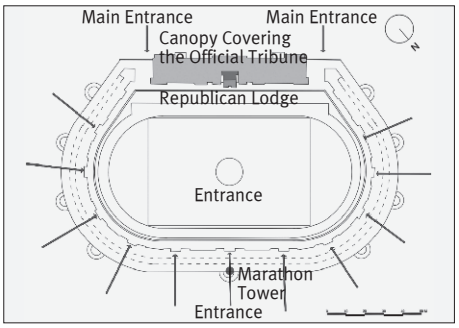
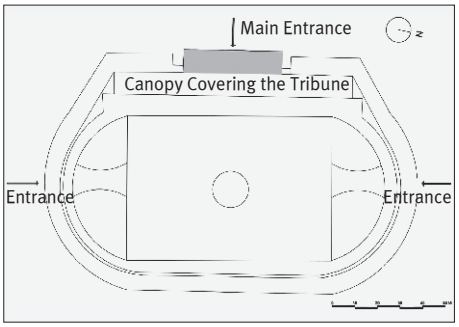


FIG. 14 SPORTS STADIUM WAS PLANNED FOR THE CAPITAL CITY OF ANKARA IN 1936

FIG. 15 PLAN OF ADANA CITY STADIUM



In the same year, Vietti-Violi worked on a stadium project for the city of Bursa. The project included a riding area, basketball court, tennis court, football training and match fields, swimming pool, shooting range, children's playground, clubhouse, and separate stands serving all areas. The stadium features a central architectural stand of classical design, complemented by a monumental entrance axis that connects to this stand. The open stands highlight the public aspect of outdoor sports while maintaining a connection to nature (Fig. 9). This entrance axis not only serves as a grand approach for spectators but also enhances the overall aesthetic appeal of the stadium, drawing attention to its monumental architectural features. In 1937, construction began, and the racetrack, riding arena, and football field were completed in 1939. The stands of the football field were also built in 1949, but the rest of the project could not be completed due to financial constraints. Abdullah Ziya Kozanoğlu, who was serving as the head of the technical department of Adana Municipality at the time, planned a stadium and completed its construction in 1932 (Yergün, 2023). The stadium consists of a football field and a small reinforced concrete tribune. In 1936, the Italian architect Paolo Vietti-Violi planned a more complex stadium for Adana City that included three tennis courts and a basketball field (Fig. 15). There was only a canopy-covered tribune. The crowd circulation was done at two site entrances. The single-tier grandstand design facilitates simple circulation, enhancing the spatial orientation of spectators.

The Italian architect Paolo Vietti-Violi planned stadium projects for the major sports clubs in Turkey: Beşiktaş, Galatasaray, and Fenerbahçe. These stadiums were bigger tribunes so as to host more spectators. Turkish architects Fazıl Saffet Aysu and Şinasi Şahingiray collaborated with Paolo Vietti-Violi in the design of the Beşiktaş and Galatasaray stadiums (Bayhan, 2013). In 1939, he designed the Beşiktaş Stadium featuring a U-shaped seating arrangement (Fig. 16). The architect designed the athletics track between the stands and the field. The stadium has not hosted football, but hosts national events and various sporting contests, including running, jumping, and throwing. By designing an inclined seating arrangement, one can enhance the visual pressure of spectators on the athletes, thereby fostering a direct sense of participation in the sporting contest. The stands are positioned in a symmetrical and simple arrangement, with the main entrances on the long sides creating a quick circulation, while the main entrance on the seaside creates a ritualistic circulation.

In 1955, Paolo Vietti-Violi prepared stadium projects for Fenerbahçe and Galatasaray (Volorio, 2016). The site plan for Fenerbahçe Stadium features an elliptical shape, fully encircled by the stands. Unlike Beşiktaş Stadium, the architect did not design the athletics track between the stands and the field; consequently, the stands are elevated by 2 meters, positioned closer to the field. The stadium is surrounded by symmetrical and open U-shaped stands that focus on the field, optimizing the spectators' sightlines and creating a sense of collective focus. In the design, a monumental simplicity has also been observed; proportional balance and functionality have been emphasised instead of ornamentation. This is also in line with the architectural understanding of the period, known as functional modernism. The entry and exit points of the structure have been planned in multiple ways, and access to the stadium has been organised functionally for different user groups (Fig. 1). Environmental axes and stairs provide access to the stands, while the main axis leads to the protocol stand. This structure makes both hierarchical organisation and mass participation visible at the spatial level.

For the Galatasaray Stadium, he designed a U-shaped football field with tribunes surrounding it. Galatasaray Stadium, a modern sporting facility from the early Republican era, is distinguished by its practical and symbolic aspects. The organisation of the stands and the location of the support system often follow a symmetrical design; this symmetry facilitates the equitable distribution of the spectators throughout the space and the balanced perception of the area. A simple geometric design facilitates effective circulation; the arrangement of entry and exit points in the tribunes optimises flow within a limited space (Fig. 17). The vertically rising stands are arranged in a way that affords the audience a commanding view of the field, facili-

tating the spread of enthusiasm by enhancing the sense of physical closeness.

The modern designs of these stadiums set a new standard for sporting venues in Turkey. Their complexity is further heightened by the integration of modern amenities such as lounges, press rooms, commercial spaces, and high-tech facilities, all of which must coexist within the constraints of urban environments. Multiple gates are planned for the management of the crowds in the stadiums to circulate the crowds. The ground level along the long side of all three stadiums was designated for serviced spaces for the crowd, while areas were allocated for team preparation. These spaces not only provided essential facilities but also ensured that both players and fans could experience a vibrant atmosphere, enhancing the overall enjoyment of events held at the stadiums. These three stadiums exemplified a rationalist approach that prioritised structural clarity and efficiency over ornamental embellishment. These stadiums sought to create spaces that fostered social interaction and accessibility. This approach aligned with the dominant architectural trends of the 1930s, which emphasised functionality, particularly in public infrastructure projects aimed at serving the community.

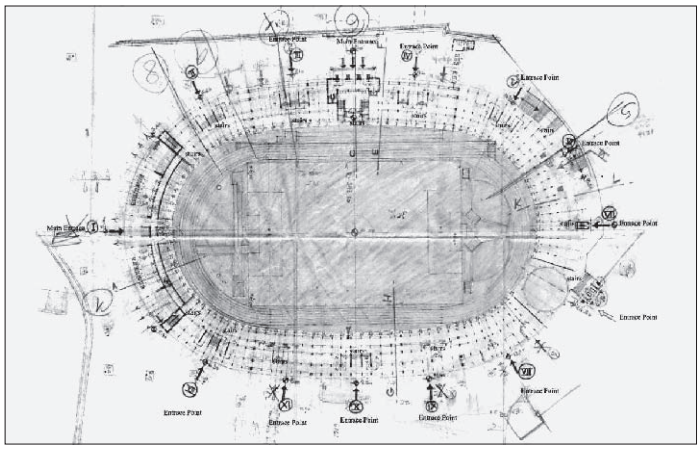


Fig. 16 Plan of the Beşiktaş Stadium by Fazil Saffet Aysu, Şinasi Şahingiray, and Paolo Vietti-Violi

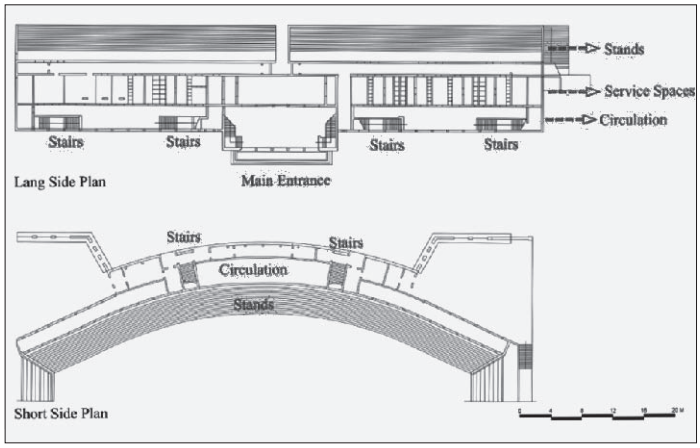


Fig. 17 Ground floor of the Galatasaray Stadium

Modern Building Materials – Glass and Reinforced Concrete

The stadiums exemplified modern materialism through the integration of technical innovations and modern architectural design. At the beginning of the 20th century, reinforced concrete, an innovative material at the time, enabled the construction of highly sophisticated buildings. In addition to showing the creative design of the tribune stairs, the stadium's construction also exhibited the strength and durability of the material (Fig. 18). Thereupon, reinforced concrete emerged as a vital component of modern stadium structures. Besides providing structural support, stadiums constructed with reinforced concrete improve the building's aesthetic appeal. Besides reinforced concrete, steel was used in the construction of the canopy of the Adana and Manisa City Stadium (Fig. 18). These had only one tribune; consequently, steel was utilised as a structural element to support the canopy structure, which consisted of sheets or tin plates. This required less precise workmanship, and as steel bars were produced in Turkey, there was a limited number of cement factories in these areas.

Besides reinforced concrete, the architect used modern glass as part of the design. The Manisa City Stadium and 19 May Stadium both used large glass surfaces to create mass at the closed tribune. Glass, reinforced concrete, and steel were pioneering materials in early modern architecture. These materials not only allowed for greater structural integrity of the stadiums (Fig. 19).

The use of reinforced concrete allowed for the creation of expansive, open spaces within the stadiums, enhancing their functionality and aesthetic appeal at the outer facades. The preferred canopy system used steel profiles, especially in the open tribune sections to bridge the gaps in Beşiktaş, Fenerbahçe, and Galatasaray. Natural stones were used to

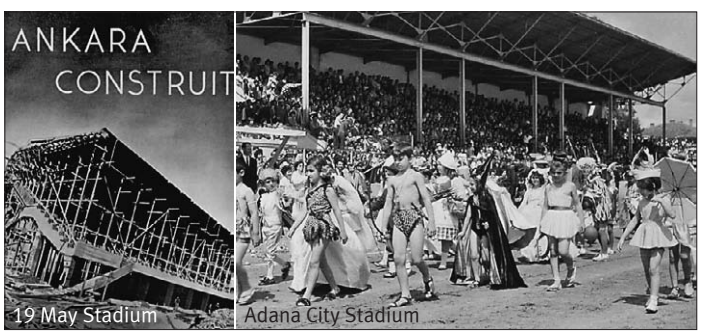


Fig. 18 Using reinforced concrete and steel for the construction of the stadiums. Construction face of the 19 May Stadium in Ankara

FIG. 19 USING A LARGE GLASS SURFACE TO CREATE A PLAIN SURFACE FOR THE CLOSED TRIBUNE AT THE 19 MAY STADIUM AND MANISA CITY STADIUM

FIG. 20 CANOPY OF THE MANISA AND 19 MAY STADIUMS

clad the main outer façade of Beşiktaş to ensure aesthetic integrity. The use of stone cladding materials demonstrates a sensitivity to the historical context of Dolmabahçe Palace, thereby providing visual harmony in the area.

The design of the canopy for tribunes was significant in terms of expressing the modern architectural aspects of the time. The reinforced concrete and steel were innovative construction materials that were used for the construction of stadiums. These materials allow for the construction of a canopy for tribunes. Manisa City Stadium had two open stand areas with a covered stand area in between them. A reinforced concrete canopy covered the middle stand area. The covered stands were accessed from three different locations via stairs, which then continued in two directions after these stairs. The construction technology of the period was demonstrated by the reinforced concrete canopy that covered the tribunes (Fig. 20). The metal-framed roof structure covering the stands with sheets or tin plates is supported at the back by the stand's reinforced concrete wall, and at the front, which faces the football field, by steel columns that are arranged in a rhythmic pattern at periodic intervals to minimise obstruction of the view (Fig. 18).

While the architect planned a reinforced concrete canopy for the Beşiktaş and Galatasaray stadiums, he did not design one for the Fenerbahçe stadium due to the oval shape of its seating arrangement. The elliptical configuration presented structural challenges that complicated the integration of a continuous canopy, both from a technical and economic perspective, within the design standards of the period.

THE LANGUAGE OF FORM: FAÇADE FORMALISM IN STADIUMS

Vietti-Violi's design incorporated elements of classical and early modernist styles in the design of the façade of the stadiums. The initial work on the city stadiums of Anatolia, Manisa, Adana, and Bursa was designed with a minimalist approach, in which the architect did not include a spectator seating area around the pitch. However, these stadiums feature only a tribune with a canopy. Accordingly, he concentrated on classical and early modernist styles in designing the outer facade of these stadiums.

At the 19 May Stadium in Ankara, the architect designed an entire spectator seating arrangement encircling the pitch. The primary front of the stadium showcases early modernist styles distinguished by monumentality and symmetry. The main tribune included a Republican lounge for ceremonies that was held in the stadium.

Beşiktaş, Fenerbahçe, and Galatasaray stadiums, which are located in Istanbul and serve as venues for prominent football clubs in Turkey, are particularly intricate structures due to their extensive spectator seating areas. They incorporated sophisticated architectural and engineering solutions to enhance aesthetic appeal and facilitate crowd control. Accordingly, stadiums employed distinct design strategies that offered various architectural forms of expression outer and inner façades of the stadiums.

OUTER FAÇADE OF THE STADIUMS: STRICT SYMMETRICAL ORDER

The public faces the outer dominant façade, which is crucial to the first generation of stadium design. In order to make the venue more appealing and interesting, public visibility and accessibility are being prioritised. The generally aesthetic first generation of stadiums was increasingly elusive for the reasons that form follows function (Jonh, et al., 2013) However, the stadium, planned by the Italian architect, had a sophisticated design of the façade.

The main dominant facade of 19 May, Adana, Manisa and Beşiktaş had a strict symmetry (Fig. 21). The main outer façade of the stadium was designed symmetrically, creating a monumental impact. The architectural historian Sibel Bozdogan confounded the significant, symmetrical, and axial characteristics of several cubic forms in modern architecture in the Republican period (Bozdogan, 2001, pp. 281-282). The horizontal effect of the glass opening of the dominant facades of the 19 May and Manisa City stadiums allowed the

venues to show their modern characters. The ribbon window and pilotis, which are accepted as modern architectural features, were cubic masses used in the formation of the outer dominant façade of the 19 May and Adana City stadiums.

The Adana City Stadium consisted of a small tribune in which the façade was lack of ornamentation and used the usage of basic geometric volumes with a plain facade. The staircase created a monumental effect through symmetrical order (Fig. 21). The entrance stairs on the left and right sides are symmetrically placed along this central axis. This symmetry contributes to the perception of the stadium as an official and public structure. The entrance facade's central section has a higher and more dominant mass, which creates an architectural hierarchy and emphasises the functional importance of the main entrance. The architectural elements on the facade exhibit a specific pattern of repetition; the stairs and openings establish a modular rhythm, while the railing features and flagpoles above further enhance this sense of repetition.

The wide glass facades with the canopy of the 19 May Stadium in Ankara, created with a cubic mass idea, the reinforced concrete extensions at the entrances, the minimalist façade, and the balcony-style lodges positioned in front of the stands all exemplify modernist architectural characteristics of the era. The facade design has been approached with a cubic mass understanding in line with the fundamental principles of modernist architecture. Openings and supporting vertical elements, columns, have been placed at regular intervals, and this arrangement has created a strong rhythmic composition on the façade; thereby, the repetition of this arrangement throughout the structure provide both structural clarity and aesthetic continuity. The main axis is oriented from northwest to southeast. Strict symmetrical order was created at the face of the protocol stand. The main entrance is placed in the precise middle of this axis, producing a monumental entry appearance. This symmetry reflects the structure's public and ceremonial purpose. The axial layout has established a spatial hierarchy that guides from the entrance to the field. There is a hierarchical order among the masses on the main facade. The central section has been elevated and, along with its covering, has created a more dominant effect. This section is used for the protocol entrance. The side wings were designed in a lower and simpler manner, supporting the dominance of the centre (Fig. 21).

Due to the location of the Beşiktaş Stadium, the short side of the stadium that faced the Marmara Sea was planned as a dominant façade. The design emphasises symmetry through the placement of two towers, oversized bronze statues, and bronze reliefs on the façade, creating a monumental presence (Fig. 22). This monumental entrance emphasises the axial arrangement. The wide staircase and the columned entrance block situated on the stadium's entrance façade establish a distinct hierarchical order in the transition from public areas to the stands. This architectural expression functions as a system that both embodies the republican regime and enhances the movement of spectators. The regular repetition of the supporting elements and steps at the facade allows the structure to be perceived as a whole with visual harmony. While the towers were built, the disc and javelin-throwing statues and bronze reliefs shown in the project were not implemented during the construction (Yergün, 2023). Cast stone composes the exterior wall surfaces, while a large bronze door serves as the main gate. The stairs also contribute to the monumental effect. The colonnaded façade enabled a powerful horizontal effect on the outer dominant façade of the stadium (Fig. 22).

Fenerbahçe Stadium reflects the modernist design principles of the era in terms of its spatial and formal composition. In the overall composition of the stadium, the distinct axis established between the main entrance and the protocol stand plays a central role in both visual orientation and functional organisation. The symmetrical arrangement of U-shaped stands of the stadium provides the structure with a regular and balanced plan scheme. In the hierarchical organisation of the structure, the design of the central stand as an enclosed space, along with its incorpo-

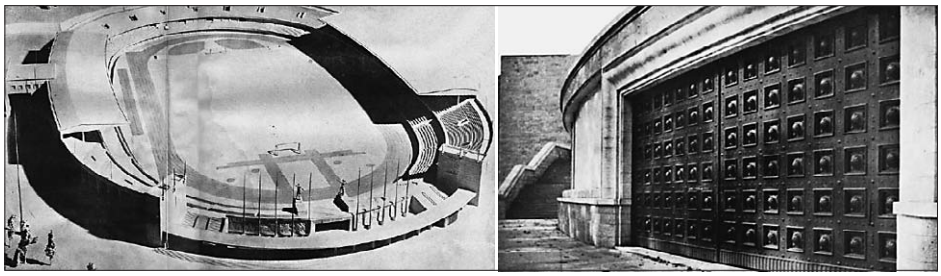


Fig. 21 Strict symmetrical outer dominant façade of the Adana City Stadium (Architect Abdullah Ziya Kozanoğlu) and 19 May Stadium (Italian architect Paolo Vietti-Violi)

Fig. 22 Formalistic approach in the design of the dominant façade of Beşiktaş Stadium

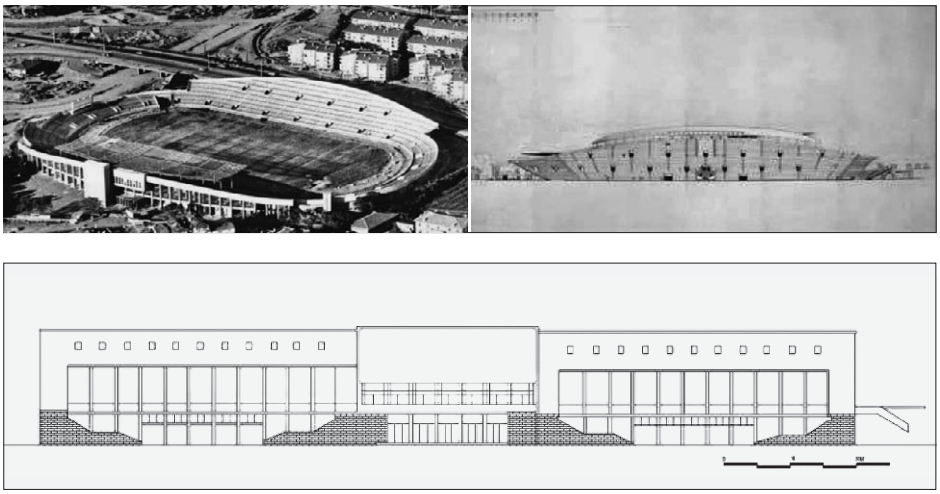


FIG. 23 VIEW AND SECTION OF THE FENERBAHCE STADIUM

FIG. 24 MAIN FAÇADE OF THE GALATASARAY STADIUM BY FAZIL SAFFET AYSU AND ŞINASI ŞAHINGIRAY

ration of service, admiration, and team preparation units, ensures that this area is distinctive both in terms of representation and functionality.

The regular repetition of the supporting columns, seating steps, and facade openings creates both structural rhythm and visual coherence, providing aesthetic continuity (Fig. 23). These features demonstrate the successful application of fundamental design principles such as axis, symmetry, hierarchy, rhythm, and repetition.

The Galatasaray stadium displays a harmonious rhythm and repetition, particularly apparent in the consistent arrangement of supporting columns, which enhances both the structural integrity and the visual continuity of the stadium. The main facade of Galatasaray Stadium is designed with a symmetrical and axial arrangement that reflects the representational architectural understanding of the early Republican period (Fig. 24). The facade features a triple horizontal division, with a dominant mass housing the protocol entrance, and blocks with simpler openings for spectators. Square-shaped windows provide visual continuity, while columned openings and entrance ramps highlight the structure's functionality. Decorative elements have been avoided on the facade; instead, a modernist expression with functional lines and proportional balance has been preferred. This approach, while representing the concept of "monumental simplicity" frequently encountered in the sports structures of the era, also establishes a balance between public participation and state seriousness in an architectural sense.

DESIGN THE STADIUM WITH A CLASSIC STYLE

While the architect applied early modernist styles with symmetry in the plan and the facades of the 19 May, Adana, Manisa, and Beşiktaş stadiums, he applied a classical style in the design of the Bursa stadium, marking a clear departure from the functionalist and minimalist aesthetic seen in his earlier works. The Bursa stadium's front facade features a round-arched colonnade in a classical style. A round-arched colonnade with elegant ornamentation enhanced the visual appeal of the stadium. The shift is apparent in the employment of large proportions, classical elements, and a more monumental approach to form, signifying an attempt to elicit a sense of tradition and timelessness. The classical features of the Bursa Stadium stand in stark contrast to the rational and modern lines of other stadiums, emphasising the architect's versatility and adaptability to diverse contextual and cultural influences. This is exemplified by the same aesthetic approach employed on the front facade of the San Siro Hippodrome in 1911 and the Rome Capannelle Hippodrome in 1923 (Fig. 25). The San Siro Hippodrome features a combination of classical architectural elements, including ashlar cladding on the ground level, expansive loggias supported by columns, and bay windows framed by Ionic pilasters on the upper level. While the classical form was used at the fronts facing the facade, an eclectic facade was designed on the inside. The classical element, portico columns, was used at ground level and modern elements, slender columns, and the reinforced concrete canopy were used at the upper level (Fig. 25).

INNER FAÇADE

In this study, the term 'interior façade' refers to the covered sections of the auditorium, which comprise a particular spatial composition that includes the protocol stand and its associated architectural elements. The careful arrangement and design of the interior façade have a critical impact on the audience's perception and engagement during events. Thereupon, the 19 May Stadium and Ankara Hippodrome, the tribunes with canopies were considered first-class stands following the understanding of that period, and the top of these stands, which included the presidential lodge, was covered with a reinforced concrete canopy. The lodges were designed to greet, address, and be seen by the public. The Atatürk Lodge, located in the Ankara Hippodrome and the 19 May Stadium, also serves this function. The stands start at a higher level than the field; thereby, under tribunes were used as service spaces for football teams. The architecture reflected the modern features inner façade of the stadiums, in which modern elements, slender columns, and the reinforced concrete and steel canopy were used (Fig. 26). The dominant

façade of Adana City Stadium was a single cubic mass, yet the tribunes were divided into three separate parts. Two of these are broader, whereas the one in the centre is slender and implies it serves as a protocol area. The staircases that elevated stands on the 19 May and the Manisa City stadiums provided a symmetrical inner façade. The architectural character of the stands is distinct from Paolo Vietti-Violi's other designs. However, the stadiums of Beşiktaş, Fenerbahçe, and Galatasaray, owing to their extensive spectator seating areas, did not receive special treatment for the inner façades. Architectural emphasis was directed mainly towards the functionality and capacity of seating structures, while the interior façades functioned as utilitarian backdrops rather than aesthetic focal points.

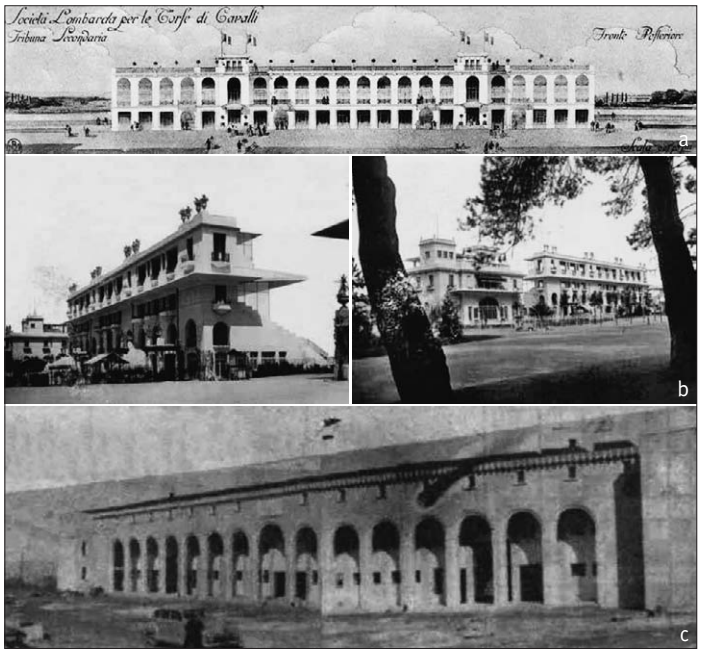


Fig. 25
a) Front facade of the S. Siro Hippodrome in Milan in 1911;
b) The front facade of the Capannelle Hippodrome in Rome in 1924;
c) The front facade of the Bursa City Stadium 1937

Expression of Structure

The tribune size of the stadiums was destined for major football clubs, Beşiktaş (1939), Galatasaray (1955), and Fenerbahçe (1955) in Turkey. The tribunes of these stadiums were bigger than those of others to host more spectators. Unlike the other stadiums, to which the architect applied early modernist styles with symmetry, the structure of the tribunes is expressed in the outer façades. The tribunes of these stadiums were constructed with reinforced concrete, in which the structural systems expressed the outer facades (Fig. 27). The structural solution suitable for shaping a tribune is the technology of the time, in which the structural system is out of formal considerations. The structure of the tribunes was expressed through the exterior of the façade. The façades exhibit dynamic lines and asymmetrical forms, resulting in a visual contrast that embodies contemporary architecture. This improved the functionality of the space, allowing for a better setting for spectators. Le Corbusier had the same view on structural expression as his modernist peers. He agreed that new materials and techniques for building structures meant that new shapes had to be created, but he saw the formulation of architectural form as a separate challenge, even though it was linked to construction methods (Corbusier, 1931). In addition to being structurally efficient, the display of the forms was also considered an architectural and structural expression. The structure appears as a cohesive whole due to the consistent repetition of the supporting elements and steps within the stands.

Fig. 26 Inner façade of the Ankara Hippodrome, 19 May, Adana and Manisa City stadiums

Social and Cultural Impact of the Stadiums

In the early Republican period, politicians regarded sports stadiums as institutions for cultivating robust, healthy generations and

Fig. 27 Expression of Structure of the Galatasary, Fenerbahçe and Beşiktaş stadiums

TABLE I PRESENTATION OF STADIUMS IN THE COURSE OF THE STUDY

Name	Time	Design strategies	Architectural Features	Structural components
19 May stadium	1932	– National representation – Republican Regime representation – Integration into urban fabric – Integration of urban life – Accessibility in urban context – Functional layout – Multi-purpose functionality – Axial composition – Symmetrical planning – Hierarchical spatial structure – Rhythm and repetition – Modern building material use – Modern architectural language	The design prioritised simplicity, geometric clarity, and functionalism over ornamentation. The stadium showcased clean lines and proportions, featuring a symmetrical and rational layout with a focus on visual clarity.	Reinforced concrete canopy Reinforced column
Manisa City Stadium	1937	– Site Selection – The site-city relationship – Integration of urban life – Accessibility in urban context – Functional layout – Symmetrical planning – Modern building material use – Modern architectural language	Early 20th-century modernism in architecture: A minimalist approach, in which the architect did not include a spectator seating area around the pitch.	Reinforced concrete canopy Reinforced column
Adana City Stadium	1936	– Integration into urban fabric – Integration of urban life – Accessibility in urban context – Multi-purpose functionality – Functional layout – Axial composition – Symmetrical planning – Rhythm and repetition – Modern building material use – Modern architectural language	Early 20th-century modernism in architecture with a simple facade arrangement. A minimalist approach, in which the architect did not include a spectator seating area around the pitch.	Canopy made of sheet metal, vertical steel beam and slender column.
Bursa City Stadium	1937	– Integration of urban landscape – Integration of urban life – Accessibility in urban context – Multi-purpose functionality – Functional layout – Symmetrical planning – Rhythm and repetition – Modern building material use – Classical architectural language	Classical style Reinforced concrete canopy Arched colonnaded passage A minimalist approach, in which the architect did not include a spectator seating area around the pitch.	Reinforced concrete canopy
Beşiktaş Stadium	1939	– Harmony with Natural Topography – Integration of urban landscape – Integration into the historical-urban fabric – Integration of urban life – Accessibility in urban context – Multi-purpose functionality – Functional layout – Axial composition – Symmetrical planning – Hierarchical spatial structure – Rhythm and repetition – Modern building material use – Modern architectural language	The stadium's architecture showcased an eclectic blend of modernist concepts and classical elements. To ensure aesthetic integrity, natural stones were used to clad the main outer façade of Beşiktaş. The structure was intricate due to its extensive spectator seating areas. To enhance its aesthetic appeal, it incorporated sophisticated architectural and engineering solutions.	Reinforced concrete skeleton system and canopy.
Fenerbahce Stadium	1955	– Integration into urban fabric – Integration of urban life – Accessibility in urban context – Functional layout – Axial composition – Symmetrical planning – Hierarchical spatial structure – Rhythm and repetition – Modern building material use – Modern architectural language	The principles of modernist design are reflected in stadium architecture: using clean lines, functional forms, and the integration of new materials and technologies. Planning symmetrical U-shaped stands and a hierarchical structure. The structure's structural rhythm and visual coherence are achieved through regular repetition of columns, seating steps, and facade openings.	Reinforced concrete skeleton system and canopy made of metal sheet.
Galatasaray Stadium	1955	– Integration into urban fabric – Integration of urban life – Accessibility in urban context – Functional layout – Axial composition – Symmetrical planning – Hierarchical spatial structure – Rhythm and repetition – Modern building material use – Modern architectural language	The stadium displays a harmonious rhythm and repetition, particularly apparent in the consistent arrangement of supporting columns, which enhances both the structural integrity and the visual continuity of the stadium. The structure was intricate due to its extensive spectator seating areas. To enhance its aesthetic appeal, it incorporated sophisticated architectural and engineering solutions.	Reinforced concrete skeleton system and canopy.

Table I Continued

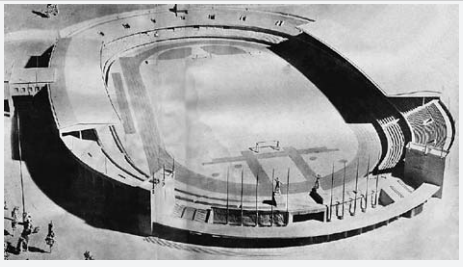
Material	The formal aspects of facades		Political and Social Context	View
	Outer	Inner		
Use of reinforced concrete and glass.	Strict symmetry	Symmetry	Political symbolism.	
Use of reinforced concrete and glass.	Strict symmetries	Symmetry	Integrating the new national narrative, progress, modernism, and secularism into Anatolian cities and promoting sport, culture, and education modernism in Anatolia.	
Use of reinforced concrete, glass, and steel	Strict symmetry	Symmetry	Integrating the new national narrative, progress, modernism, and secularism into Anatolian cities and promoting sport, culture, and education modernism in Anatolia.	 
Stone cladding, use of reinforced concrete.	Strict symmetry	Symmetry	Integrating the new national narrative, progress, modernism, and secularism into Anatolian cities and promoting sport, culture, and education modernism in Anatolia.	
Use of reinforced concrete glass, steel and cladding stone.	Strict symmetry and asymmetrical form.	Not receive special treatment.	Reflections of the political aspirations of the Republican regime encomp ass the evolving urban-social dynamics of Istanbul.	
Use of reinforced concrete, glass, and steel.	Asymmetrical form: expression of structure at façades.	Not receive special treatment.	Reflections of the political aspirations of the Republican regime encompass the evolving urban-social dynamics of Istanbul.	
Use of reinforced concrete, glass, and steel.	Strict symmetry: expression of structure at façade and main outer façade design.	Not receive special treatment.	Reflections of the political aspirations of the Republican regime encompass the evolving urban-social dynamics of Istanbul.	

Fig. 28 Expression of Structure of the Galatasary, Fenerbahçe and Beşiktaş stadiums

imparting physical culture. In the opening ceremony of the 19 May Stadium in the capital Ankara, Prime Minister İsmet İnönü regarded the stadium as a school, which was a tool for cultivating the Turkish nation: "The authorities in Turkey intend to construct sports stadiums across the country, viewing them as significant centres for education; consequently, the development of these stadiums will create opportunities for the youth, who will shape the future of Turkey" (Anon., 1936). Falih Rıfkı Atay, a prominent journalist of the Republican era, remarked on the significance of the 19 May Stadium in Ankara: "For our youth, stadiums hold equal importance to schools. We must finish our education in intelligence, which includes knowledge, action, and movement" (Atay, 1936). This sentiment underscored the belief that physical education and sports were integral to the holistic development of the Turkish nation in the Republican era. Turkey invested in athletic prowess by providing modern sports stadiums and fostered a generation equipped with the skills and discipline necessary for broader nation-building. Within the framework of Republican ideology, 'youth and physical education' were viewed as the nation's future, with physical fitness linked to moral and civic strength. Thereupon, stadiums acted as a centre for school and youth sports festivals.

The provision of stadiums aimed to promote health and well-being within society. The emphasis on stadiums became a crucial component of the educational curriculum, reflecting the regime's intention to foster a strong and vigorous citizenry. Under the Republican regime, the final years of the Ottoman Empire were characterised as "the sick man of Europe", and a new standard was established for raising "robust and fierce children" – the ideal citizens of modern Turkey. The "sick man" was regarded as unusual by the Ottoman authorities, which led to the establishment of standards for a "healthy body" during the Republican period. Through stadiums, events encouraged community awareness of health and promoted a positive body image for both men and women. A heightened emphasis on health and exercise began to permeate all aspects of society, further entrenching these ideals in everyday life.

Accordingly, stadiums were not holding football matches, they were used for national events during the Republican period. They were used as a platform for political events, speeches and official state ceremonies. August 30 Victory Day, October 29 Republic Day of Turkey, May 19th Commemoration of Atatürk, Youth and Sports Day, and April 23 National Sovereignty and Children's Day were the events that took place in the stadiums. These events position the stadiums as a platform for the expression of national identity. The events reflect significant turning points in Turkish history and illustrate how the Ottoman "sick man" declined, while a secular, modern, and robust nation emerged through sports and gymnastics performances organised in the stadium by both male and female bodies (Fig. 28). Consequently, these efforts contributed to a sense of national pride and identity, reinforcing the social fabric of the newly established Republic. These efforts fostered national pride and identity, thereby strengthening the social fabric of the newly established republic.

Beşiktaş, Fenerbahçe, and Galatasaray stadiums influenced the development of modern leisure culture and urbanisation, which led to the gradual rise of the urban middle class. Stadiums emerged as vital spaces for community identity, particularly as each club possessed distinct class, regional, or institutional affiliations. Accordingly, these stadiums became focal points for social interaction, they played a crucial role in promoting civic pride and engagement within the urban environment.

Conclusion

This study explores the first-generation stadiums constructed during the early Republic of Turkey, designed by Paolo Vietti-Violi and his team, focusing on their architectural, spatial, urban and ideological dimensions, thereby demonstrating how modern sports facilities have evolved into instruments that influence the nation-building process in Turkey. The study of six stadiums – Beşiktaş, Galatasaray, Fenerbahçe, Adana, Bursa, Manisa, and 19 May – has uncovered both common elements in the architectural styles of the period and distinctive techniques that reflect the varying contexts. Especially layout, symmetry, hierarchy, rhythm, and repetition – fundamental architectural principles – have emerged as cornerstones in establishing spatial order within all stadiums. The symmetrical organisation between the main entrance and the stands with the lodge holds significant importance, both in terms of functional orientation and ideological representation. The exploration of stadiums reveals the use of large glass surfaces and a formalistic approach in their outer façade, fostering harmony and emotional equilibrium. Italian ar-

chitect Paolo Vietti-Violi used classical and modern vocabularies to create stadiums with a classical style and strict symmetry. The outer façade expresses the structures of the tribunes, resulting in modern structure, enclosure, and finishes that embody a cohesive idea of modernity.

However, the extent to which these concepts have been adopted differs according to urban dimensions and social contexts. In the analysed stadiums, several continuous architectural characteristics (symmetry, axial configuration, focus on protocol) have been identified alongside new solutions that arise in response to contextual requirements. Distinct differences in spatial scale and capacity are observed among the stadiums constructed during the early Republican period. Especially in the Ankara 19 May Stadium and the Beşiktaş, Galatasaray, and Fenerbahçe stadiums in Istanbul, large-capacity stands were constructed to cater to larger crowds, reflecting the needs of both the cities and the teams' followers. These structures were designed not only to host sports events but also to accommodate state ceremonies, mass demonstrations, and ideological representations. In contrast, in stadiums located in Anatolian cities such as Adana, Bursa, and Manisa, the seating capacity has been relatively limited; accordingly, the spatial organisation has been designed in a simpler, user-focused manner aimed at the local community. This differentiation demonstrates that Paolo Vietti-Violi's design approach possesses contextual flexibility and that each structure is shaped according to its socio-urban function.

Stadiums were constructed not merely as reflections of Western modernist architecture but also as a symbol of a new nation, despite their spatial and formal designs being influenced by that style. Here, early modern stadiums are considered more than just venues to hold sporting events; they are also "constructed spaces" that represent Republican ideological narratives in the newly established state.

In conclusion, the stadium designs by Paolo Vietti-Violi and his team in Turkey represent significant examples, both in the realm of architectural history and in the understanding of the spatial components involved in modern nation-building. Future studies could expand the discussion to encompass user experience, memory, and preservation policies related to these structures.

[Proofread by Cemal Kılıç]

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Fig. 1 The urban planning situation of the Technical Campus on the eastern outskirts of Zagreb in 1947

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Technical Campus in Borongaj (1947-1949) as a Prefiguration of Zagreb's Directive Regulatory Planning

Le Corbusier
planned economy
postwar urban planning
Technical Campus
University City

The unrealized Technical Campus project on Zagreb's eastern outskirts was envisioned as a key driver of the city's industrialization, with funding allocated as part of the economic framework of the First Five-Year Plan. This ambitious complex was designed to train technically educated professionals, with the Directive Regulatory Plan allocating the eastern parts of the city for its development and expansion. However, just two years after its initial conception, the project faced obstacles that delayed its phased implementation and ultimately halted construction. This paper explores the evolving role of engineers within the existing model of technical education, emphasizing a blend of theoretical and practical training. It also examines the procedures, organizational structures of urban planning authorities, and the highly educated professionals involved – whose work was often uncoordinated, with decisions frequently revised or deferred. By analyzing the spatial and programmatic aspects of the Technical Campus, the study seeks to highlight how planning this peripheral urban enclave as a fragment prefigures the broader strategy: a smaller-scale embodiment of a larger spatial framework that demonstrated notable resilience despite the ongoing regulatory shifts and administrative reorganizations characteristic of the early postwar period.

Introduction: Planned Industrialization and Workforce Education Planning

The scale of the transformation of the social and political system following the founding of the *Federal People's Republic of Yugoslavia* (FPRY) was radical. These changes resulted in the centralization of the entire architectural profession, effectively transforming it into a bureaucratic machinery of the newly institutionalized state (Čavlović, 2017).

While the Soviet model of growth and development was officially adopted, the instruments of urban planning and architectural design were to be applied under radically altered conditions by a generation of architects whose education had been shaped before the Second World War. A significant portion of the highly educated workforce was employed in government and state-run enterprises. A smaller number were recruited to the Technical Faculty in Zagreb. The education system reform aimed at providing widespread access to education and fostering the professional development of the population, resulting in increased enrollment quotas across all levels and fields of educational institutions. The decision was, inter alia, ideologically motivated.[1] The Technical Faculty, an institution responsible for educating engineers in Croatia's capital and principal industrial center[2], emerged as the foundational institution of architectural transformation – more precisely, the visible and tangible transformation of society itself.

The post-war pedagogical model was based on a direct connection between the educational process and industrial practice, and was largely conditioned by the need to produce a highly efficient workforce that could be immediately deployed to workplaces and integrated into the production process. The decision of a factory to build school buildings, mainly for secondary education, right next to its own production facilities was not a rare occurrence.[3] Integral to this vision was the proposal to construct a new campus of the Technical Faculty at Borongaj in Zagreb[4], situated at the far eastern periphery of the city – an area where, due to prevailing winds, groundwater flow, and proximity to the railway, land parcels had already been designated for the large-scale expansion of polluting industrial facilities (Antolić, 1951).

The pedagogical reform was implemented with the support of the state administration system, by separating the institutions of technical education and placing them under the competence of the *Department of Vocational Education of the Ministry of Industry and Mining*, set up in 1945. As early as 1948, this structure was altered, and the Technical Faculty, along with the rest of the University of Zagreb, came under the jurisdiction of the *Committee for Scientific Institutions, Universities, and Higher Education* (Minutes, 1948a). The reform also affected the *Administration for the Construction of the Technical Faculty*, established in 1947, which was now integrated into a broader framework addressing the construction needs of other university departments. As a result, the Technical Faculty and the Institute for Industrial Research no longer fell under the jurisdiction of the Ministry of Industry. This shift created a need for coordinated land use planning between the two institutions, anticipating their eventual functional and physical separation. Consequently, the Technical Faculty's development was planned in conjunction with the overall expansion of the University of Zagreb.

Given the ambitious vision for social progress and the need to train engineers "who would be prepared at the university to handle both general and specialized tasks", the existing spatial capacities of the Technical Faculty in Zagreb – whose laboratories were dispersed across multiple locations – were insufficient to support the desired growth of the new state and were thus deemed inadequate. At that time, the Faculty operated at the location on today's 6, Roosevelt Square, where the Technical College was established as early as 1919. The Technical Faculty, as the Technical College's successor, with its departments of architecture, geodesy and construction, was relocated to a new building at

Fig. 2 The new building of the Technical Faculty at 26 Kačićeva Street, designed by architects Edo Šen and Milovan Kovačević, was opened in 1940 in Zagreb

1 "Education in schools and universities was the monopoly of the children of the bourgeoisie and landowners, while the mass of students of poor parents were largely prevented from studying, and, if they did study, it was in misery and poverty." (Z.R., 1950)

2 The Technical Faculty in Zagreb is an institution of higher education founded in 1926, as a successor to the Technical College. It consisted of departments of architecture, construction, geodesy and cultural engineering, mechanical and electrical engineering, shipbuilding, marine engineering, and chemical engineering. The organizational structure and names of its departments changed over time. In 1956 the Faculty of Engineering was dissolved, and its constituent parts continue to operate as independent faculties of the University of Zagreb. (Jecic, Smolcic, 2018)

3 In this regard, the exhibition "Schooling of New Industry Personnel" of the Ministry of Industry and Mining, presented in the first issue of the journal *Architecture* of the Association of Societies of Engineers and Technicians of the FPRY, is very informative. (*** 1947a)

4 "The city authorities allocated 142 acres of land at Borongaj." (Šidak, ed., 1969: 198)

5 After the Faculty of Engineering moved out of Kačićeva Street, the building was supposed to be occupied by the Federal Technical Secondary School.

6 Initially, the intention was to use the Agricultural and Forestry Estate in Maksimir for the Faculty of Engineering, but it was estimated that the land surface was too small to accommodate all the faculty buildings. "South of Borongaj, the first four buildings of the Faculty of Engineering will be built this year." (*** 1947b: 4).

26, Kačićeva Street in 1940[5] (Fig. 2). The construction of new buildings was set as a priority after the end of the war, and the search for suitable locations became a key concern for the faculty leadership.[6] The decision to relocate the entire set of university programmes to the outskirts of the city was made in the context of new social circumstances, and work on its implementation began in 1947.

However, the selection of the location was not without controversy, with faculty members of the Technical Faculty highlighting its disadvantages, describing the location as "too far from the city center", "climatically unfavorable", and "difficult to access in terms of transportation" (Minutes, 1947a). The location was also not approved by the urban-planning bureau of the *Ministry of Construction*, which developed the first post-war *Directive Regulatory Plan of Zagreb*. Moreover, considering that the selected land was ideal for industrial purposes, and not for educational ones, Zagreb's urban planners believed that this initiative "in no way corresponds to the needs of the development of the city" (Report, 1947). Under the pressure of an all-encompassing development, apparently exerted by the *Ministry of Industry*, it was decided that the new campus be located

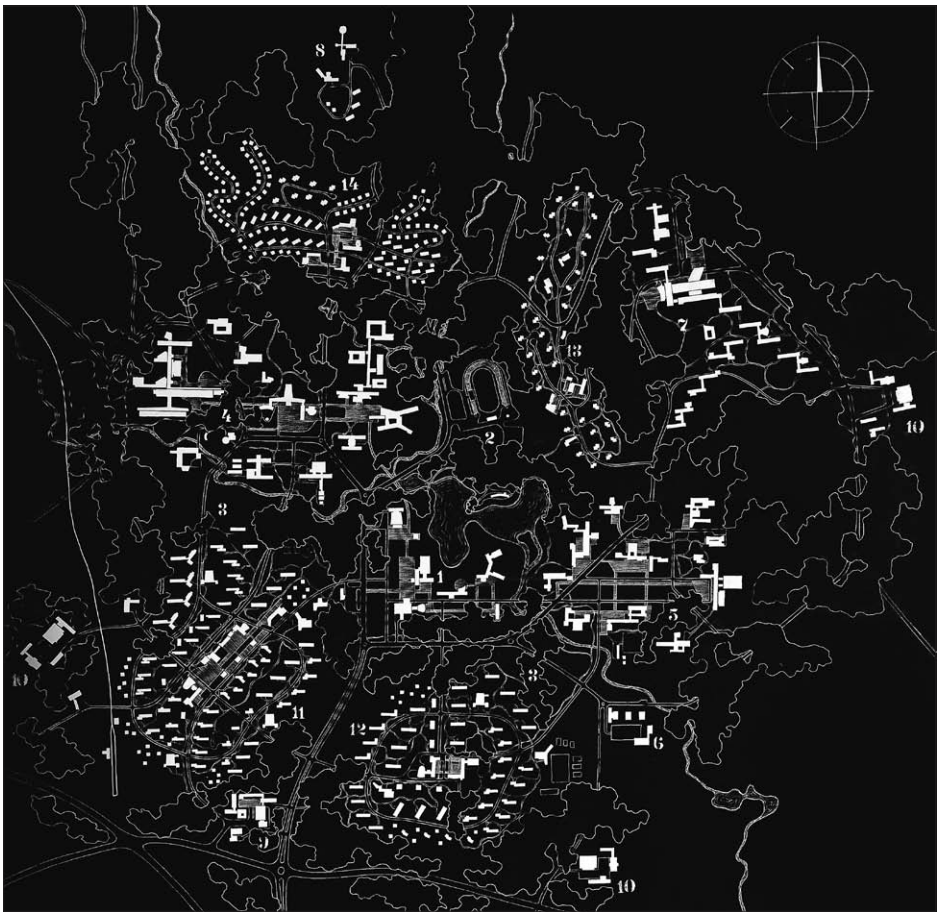

Fig. 3 The next phase of the city's eastern development was the urban planning concept for the University Campus

directly next to the industrial zone that the academic curriculum was supposed to serve. The Žitnjak industrial zone was just starting its own extensive expansion with the simultaneous construction of several industrial giants. The steam-boiler factory began operating in 1948, and the Prvomajska machine-tool factory in 1949. Both factories were meant to occupy important positions for Yugoslav heavy industry, on both domestic and foreign markets. The industrial zone in Žitnjak continued to densify over the following decades, during which several dozen labour organizations established their premises within its boundaries.[7] In response to new trends in technical education, the integration of scientific activity and the educational process with production facilities constrained the broader theoretical university curriculum, steering it towards synchronization with pragmatic economic demands.

The building programme for the generously scaled complex, spanning approximately 60 hectares of land, was developed in January 1947 by faculty members of the Department of Architecture: Alfred Albini, Juraj Denzler, Drago Galić, Božidar Rašica, Zdenko Strižić, Neven Šegvić, and Vladimir Turina (Minutes, 1947f). In April of the same year, the First Five-Year Plan for the Development of the National Economy of the FPRY was launched. "Given the importance of training skilled professionals, particularly engineers across various disciplines essential for the implementation of industrialization and electrification, as well as the execution of the Five-Year Plan" (Letter, 1947c), the construction of the Technical Faculty was designated as a priority by the *Republican Planning Commission*.[8] Building on the planning momentum, an urban design proposal for the campus was developed over the following two years, including a schematic layout of the buildings for individual departments, research institutes, and supporting facilities (Fig. 1). Architectural design proposals and execution documentation were developed for certain buildings, serving as the basis for their realization. The construction of the Geodesy Department building, the Institute for Industrial Research, and housing for auxiliary staff was completed, while site staking was carried out for some of the subsequently planned structures.

In 1948, the planning for the second, much more expansive project of the University of Zagreb commenced: the *University City of Dubrava* (Seissel, 1957; Fig. 3). *The University City* stands as a testament to an even greater ambition for territorial and educational expansion than that was demonstrated by the Technical Campus. As a self-contained urban enclave, the *University City* was envisioned to house the entire academic program of the University of Zagreb (Fig. 4). The faculty members of the Department of Architecture at the Technical Faculty prepared the project documentation for this university center as well. In this process, the designs for some of the buildings of the Technical Faculty at Borongaj were entirely replicated at this new location. The *University City of Dubrava* suffered a similar fate to its Borongaj predecessor. Construction began in 1949 with the development of approximately twenty student housing pavilions, carefully designed to adapt to the terrain, optimize orientation, and integrate with the surrounding traffic network.[9] The Technical Campus was subsequently repositioned, becoming just one of several clusters within the *University City*. In this new constellation, it lost its direct connection to the manufacturing industry. The relocation itself fundamentally altered its identity – shifting from a technical hub to a broader university center.

The planning and translocation of the Technical Campus is not merely further evidence of the characteristic Yugoslav planning strategy – which treated urban planning as a subcat-

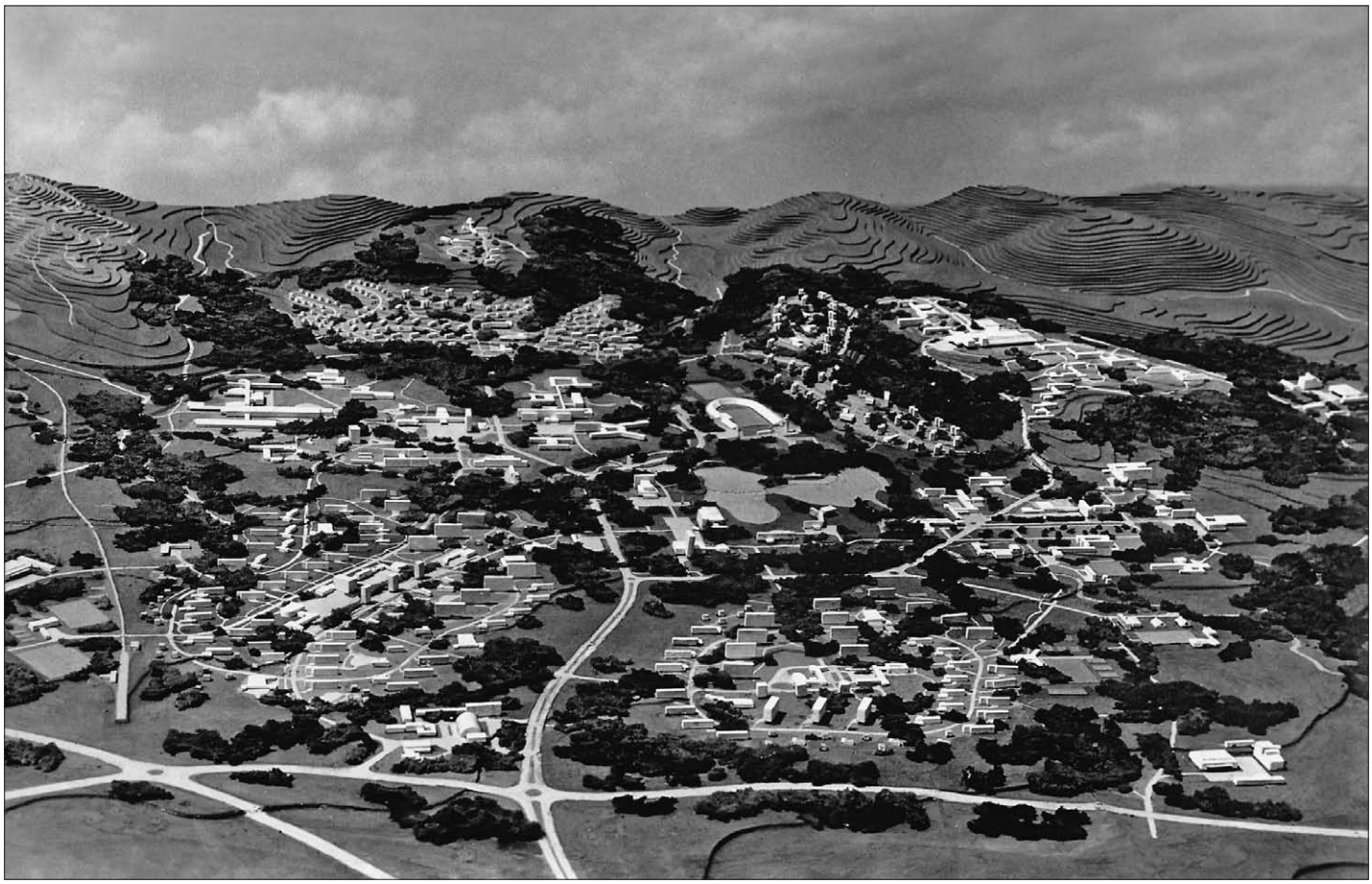

Fig. 4 The fundamental urban planning principle was based on the construction of building clusters surrounded by freely designed green spaces

egory of architecture (Fischer, 1965: 67) and in which "practitioners considered it an art rather than a science" (Neumann, 2023: 7) – but also an example of a pragmatic and operational appropriation of the functionalist model of urban planning, capable of adapting to the social and economic turbulence of a young socialist state. The insertion of buildings into an urban cluster, their relocation, and eventual removal and redrawing into the fabric of another location did not depend solely on the authority of a single figure – in this case, the architect and urban planner Vlado Antolić – but rather on a cohort of modernist-oriented architects "influenced by the concept of the functional city articulated in Le Corbusier's Athens Charter" (Neumann, 2023: 7).

By shaping the urban environment through the strategic placement of buildings within freely composed natural landscapes, architects and urban planners – guided by what Andre Mohorovičić (1952: 49) described as an "adequate artistic expression" – effectively bridged the gap between urban planning and architectural design, treating urban plans not merely as functional layouts but as compositions with an intrinsic artistic quality (Le Normand, 2014: 37).

Individual buildings, despite being designed by different authors, could thus be sited within park-like landscapes without a loss of design time or efficiency. The strategy of freely positioned entities within a green environment allowed for the same building – defined exclusively by its solar orientation – to be relocated, reused, and ultimately constructed in later iterations of the plan, or phased according to available funding. The strategy proved effective because it rested on the shared premise that Le Corbusier's

7 The development of the industrial zone at Žitnjak is presented in detail in: Kunšten, 1977.

8 Andre Mohorovičić, himself a member of the Technical Faculty Department of Architecture, was the president of the Planning Commission from 1945 to 1947 and the rector of the University of Zagreb from 1947 to 1949.

9 The construction was carried out by the Youth Construction Company "Dom", which consisted of volunteer student brigades (Z.R., 1950). The "Student City" built at that time, originally conceived as a cluster of the larger University city in Dubrava, is a district thar bears the same name to this day.

work served as a primary reference point for both architects and urban planners (Kulić et al., 2012: 36).

Indicative of this approach are the "Student Cities" in Belgrade, Zagreb, and Ljubljana – initiated by the government of the FPRY – which, despite remaining unfinished, still persist in these cities today. Thrown into space, their only determinant within the green landscape was their orientation along the heliocentric axis. Viewed from above, the directional disposition of these buildings clearly diverges from their surroundings, which were subsequently developed according to entirely different urban planning paradigms.[10]

The Faculty of Engineering at Borongaj as an Example of the Directive Regulatory Plan

Parallel to the planning of the Technical Campus, preparations were underway for the Directive Regulatory Plan of Zagreb, the city's overarching urban planning document. The authority responsible for urban planning fell under the *Ministry of Construction of the People's Republic of Croatia*, specifically its *Urban Planning Department*. A reorganization of this department in late 1947 led to the establishment of the *Urban Planning Institute of Croatia*, which, since then, operated within the *Ministry of Communal Affairs of the People's Republic of Croatia*. Urban planning for Zagreb remained within this Institute until the founding of the *Urban Planning Bureau of the People's Committee of the City of Zagreb* in 1951, at which point responsibility for city planning was transferred to the municipal administration. Throughout the entire period, Vlado Antolić remained the key figure and unifying force behind the development of the regulatory plan, maintaining continuity despite ongoing bureaucratic transformations. However, the effectiveness of the plan was constrained by the need to reconcile competing interests, which arose from various stakeholders in the rapidly changing post-war environment. As a result, *People's Committee of the City of Zagreb* continued issuing construction permits in accordance with the prewar General Regulatory Plan.

At the same time, while discussions on the new directive development plan were ongoing, the "locating" process – overseen by Vlado Antolić between 1947 and 1953 – proved crucial for the city's growth. Through this practice, Antolić personally determined building sites for various applicants, thereby guiding the realization of construction projects during a transitional and complex period (Kolacio, 1958). He embodied precisely the kind of professional who, as Le Normand (2014: 37) observes, "would be called an urban planner when discussing projects that involved the relationship between different buildings and objects at the site, and an architect when designing particular buildings."

Due to inconsistencies in the First Five-Year Plan, republican ministries made decisions based on the perspectives of their own planning departments, often preceding the establishment of urban planning regulations. In accordance with the land-use provisions of the pre-war General Regulatory Plan of Zagreb, but without prior approval from the urban planning authorities, the decision was made to locate the Technical Faculty campus in Borongaj (Report, 1947). Within the city's core, no land of sufficient size was available that was not burdened by unresolved ownership issues (Minutes, 1947a).

As a result, the site for the Technical Faculty was allocated from the land fund of the agrarian reform and colonization program of the People's Republic of Croatia (Letter, 1949). The selected location lay south of the then-operational military airfield in Borongaj. Plans for the airfield's modernization entailed its relocation to a more suitable site outside the city limits, thereby freeing up its existing area for the potential expansion of the campus (Minutes, 1947c). However, urban planners believed that the airfield site was better suited for industrial development. The only reason this had not been reflected in pre-war planning documents was, as noted at the time, the "inaccessibility and lack of understanding from the military authorities in the former Yugoslavia" (Report, 1947).

The decision on the campus location, the transfer of land ownership, and the initiation of the project were carried out without the knowledge or approval of the urban planning authorities, who were subsequently forced to implement the project as an imposed initiative – one that had to be realized without exception. Notably, the completed *Directive Regulatory Plan of Zagreb*, presented to the public in 1949, designated the city's eastern area for university facilities (Antolić, 1949). However, this regulatory plan was never officially adopted as a binding spatial-planning document. This case clearly illustrates the prevailing tensions and misalignments between various stakeholders involved in city planning – including urban planning authorities, economic interest groups, and political leadership – whose competing visions for managing urban development ultimately led to the rejection of a comprehensive regulatory document during this early postwar period.[11]

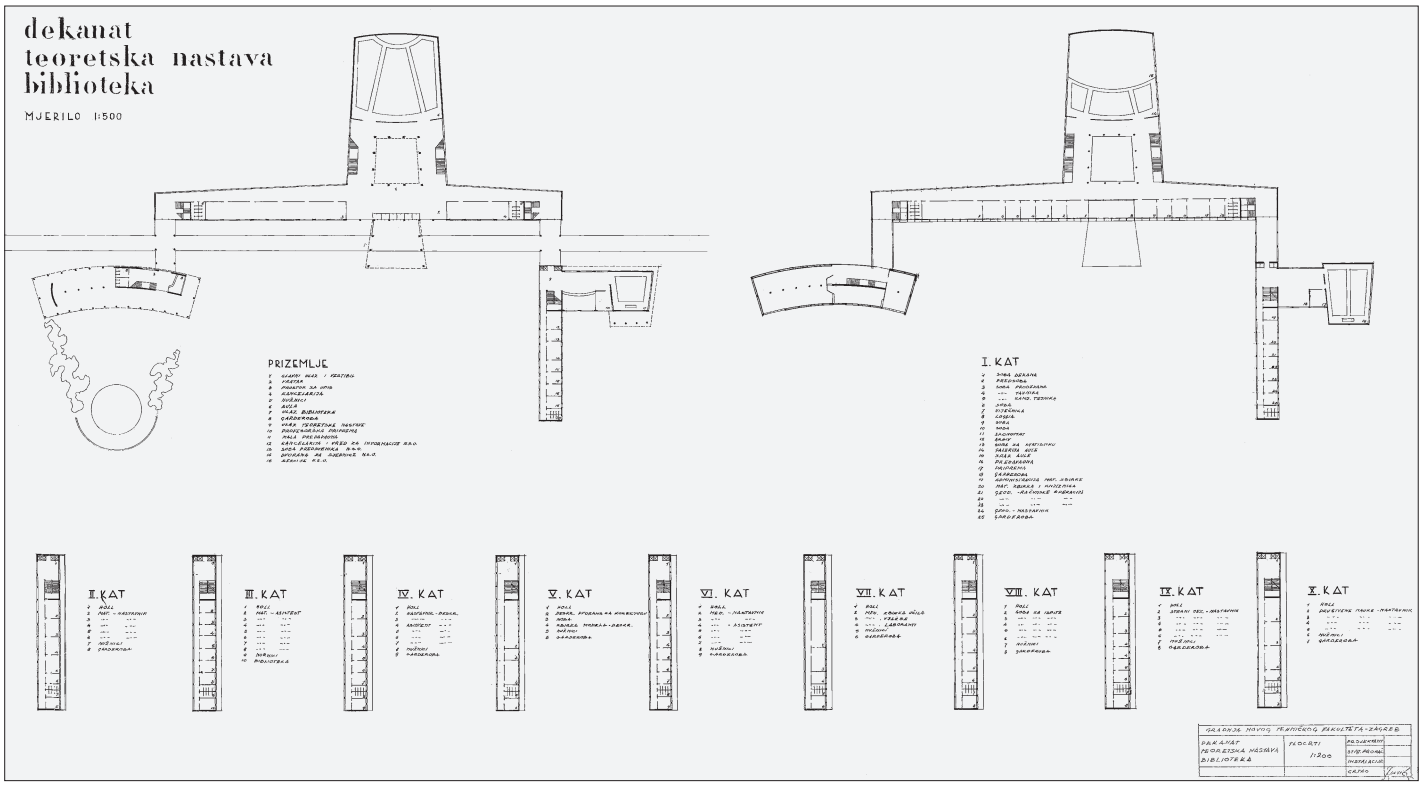

Fig. 5 The architectural design of the Dean's Office building at the Technical Campus

The Technical Campus as an Integral Part of the Planning Strategy for the Management of the City's Development

The programmatic core of the situational plan "for the land in the eastern part of the city of Zagreb, in the Borongaj area, between the eastern bypass road, the extension of the Dubrovačka Road, and the new Belgrade-Zagreb motorway"[12] was developed by architect Vladimir Turina. This was hardly unusual, given that "urban planning was not taught as a separate discipline in Yugoslav universities, but rather as one of the courses in an architecture program" (Le Normand, 2014: 37). During the planning process, additional facilities were considered, including a "building with a pool for shipbuilding experimentations" (Minutes, 1948b). Ultimately, however, the *Shipbuilding Institute* was relocated to a site south of the Sava River, serving as a pioneering intervention that marked the city's expansion across the river – an early step towards the development of what would, in the following decades, emerge as New (Southern) Zagreb. The translocation of the *Shipbuilding Institute*, as well as the translation and rotation of the architectural complex such as that of the *People's Committee of the City of Zagreb* (*** 1956: 57-58; *** 1960: 50-54), serve as examples of a planning strategy of insertion and removal and redrawing: an approach sufficiently flexible to accommodate frequently shifting needs, while maintaining the coherence of the broader urban planning framework within which such interventions were executed.

These programmatic interventions further illustrate how planning decisions and site allocations were often made in real time, directly over city maps. One such proposal even suggested relocating the entire Technical Campus from Borongaj to a Maksimir site south of the park (Minutes, 1947a). This proposal was ultimately rejected, and in the fol-

10 The unrealized projects of the Faculty of Engineering at Borongaj and the University City at Dubrava in the context of structural integration of higher-education facilities into the fabric of the city are presented in: Rister, 2006.

11 Considerations of anti-aircraft defense came into conflict with the planned industrial zoning on the city's eastern periphery, prompting so-called "de-zoning" measures intended to improve the city's overall defensive capability. (Report on the case of the New Building of the Zagreb Technical Faculty, 1947: 3).

12 These roads were planned or under construction at the time. The eastern bypass road has not been constructed. Dubrovačka Road is a continuation of today's Vukovarska Street, and was planned but never realized. The Zagreb-Belgrade highway was constructed at the time primarily thanks to the work of youth labour brigades. Its section here referred to is today's Slavonska Avenue in Zagreb. (Technical Programme, undated)

Fig. 6 The auxiliary staff housing designed by Zdenko Strižić ultimately became one of the few projects that were actually built

Fig. 7 The Geodesy Department building by Juraj Denzler was one of the few structures of the Technical Campus fully realized according to its original intentions. Unfortunately, it has since been demolished.

lowing years, the Maksimir City Stadium was built on that very location.

The urban ensemble of the Borongaj campus was conceived by Turina in the manner of an open, park-like city. Pavilion-type building clusters extend freely across the landscape, simultaneously defining its functional logic. The parkland was designed by architect Zvonimir Frölich (Minutes, 1947e), who employed plant species not for decorative purposes but as a sanitary measure for outdoor spaces (Frölich, 1958).[13] For this reason, he insisted on "avoiding color contrasts while creating contrasts in the shapes of canopies". Shrubs were to be placed adjacent to buildings, while trees planted along the perimeter were to be "compact and dense to create a forest-like atmosphere" (Minutes, 1947d). The park's planting was planned even before the construction of the Geodesy Department and the Dean's Office – the first buildings slated for realization. However, it was halted due to a shortage of plant species, as the City Planting Office of the Municipal Department for Public Works was "overburdened with numerous existing obligations" (Minutes, 1947d).

By decree of the Ministry of Industry in May 1947, the *Administration for the Construction of the Technical Faculty* and its *Construction Committee* were established (Decision, undated). Architect Pavao Jušić was appointed head of the Administration (Letter, 1947b), while members of the Department of Architecture at the Technical Faculty were entrusted with preparing architectural studies for the individual faculty buildings. To this end, five design teams were formed, each responsible for one of the buildings planned in the initial phase. Architect Zdenko Strižić was tasked with designing the Architecture Department building, Juraj Denzler with the Geodesy Department, Alfred Albini with the Physics Institute, Vladimir Turina with the Mechanical Engineering Department, and Neven Šegvić with the Dean's Office (Fig. 5), which also housed theoretical classrooms and a library (Letter, 1947a). All of them belonged to the most established circle of postwar architects in Croatia, and given that they were simultaneously part of the teaching staff, their understanding of pedagogical processes was unquestionable.

Two fundamental elements formed the structural framework of the campus: the faculty and research institute buildings, and the park-like terrain landscaped with trees, low shrubs, and grass. While organically arranged natural elements were carefully integrated into the densely stratified terrain – comprising private agricultural plots that would have posed significant expropriation challenges – individual buildings float freely and unbound across vast, undeveloped parcels. The freedom of their disposition, however, was counterbalanced by a rigid axiality and a dogmatically executed heliocentric orientation, which all buildings adhered to without deviation.

The clear separation of independently designed buildings from their natural surroundings finds its precedent in Le Corbusier's urban schemes, *Urbanisme* (1925) and *La Ville*

Radieuse (1935). However, whereas Le Corbusier compensated for the detachment of buildings from the landscape by designing them as complex entities ready to accomodate diverse functions (Woudstra, 2000) – ranging from housing to commercial, sports, and childcare facilities, here the "ocean liners" are indeed liberated and entirely autonomous in their spatial disposition, yet lack a sufficiently layered programmatic and organizational structure.

Furthermore, Corbusier's plans were often criticized for their excessive diffuseness, where functions were too diluted and spatially isolated to generate the dynamic urban events characteristic of city streets (Avermaete, Gosseye, 2021: 130). In contrast, the Borongaj campus adopted a strategy of an open terrain defined solely by natural elements and architecturally autonomous buildings, ensuring that, regardless of changes in location, authorship, or phased construction, the plan could be realized even under highly unstable conditions.

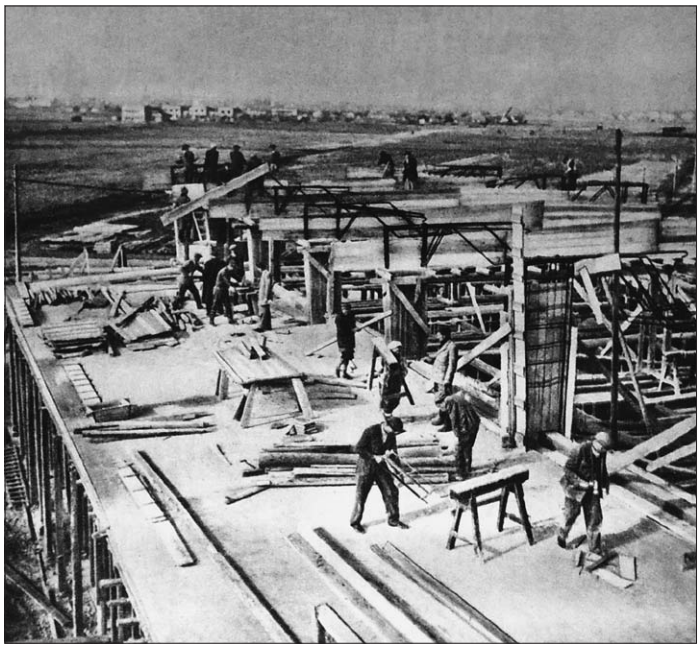

Fig. 8 Construction works on the technical campus

Initiation, Progress and Abandonment of Construction

Difficulties in construction arose soon after mid-1948, following the *Informbiro* Resolution, which led to Yugoslavia's expulsion from the bloc of communist countries. This event resulted in widespread political isolation and the cessation of economic cooperation with Eastern Bloc nations, severely destabilizing the Yugoslav economy. Despite all efforts, the First Five-Year Plan failed to materialize and was postponed for a year. Architectural projects had to be adapted to conditions of severe scarcity. The *Ministry of Construction* of the FPRY introduced the "*Guidelines for Rational Design"* and the *"Basic Economic Norms for Social Standard Buildings"* (Rational Design Guidelines, 1948), which regulated the spatial efficiency of layouts, the use of construction materials, the adequacy of structural solutions, and compliance with technical regulations. When issuing building permits, the *Ministry's Project Review Commission* evaluated adherence to these regulations. Construction planning was dictated by the availability of specific materials, and material reduction became the defining formal paradigm of the late 1940s.

The realization of the Technical Faculty complex began in mid-1947. Civil engineering works were entrusted to the construction company Cestogradnja, while structural works were assigned to Tehnika. Roads were laid out, and a construction sequence was established: following the auxiliary staff housing designed by Zdenko Strižić (Fig. 6), work was to proceed with the faculty buildings for the Geodesy Department by Juraj Denzler (Fig. 7) and the Architecture Department by Strižić (Minutes, 1947b). Despite numerous difficulties, construction continued throughout the following year. By the end of 1948, the auxiliary staff housing was awaiting roof installation, and the Geodesy building was emerging from its foundations (Fig. 8). A delay in the Architecture Department's programming due to curriculum changes redirected the construction sequence towards the Dean's Office, the library, and theoretical teaching facilities, which reached the preparatory works stage. The Bliznec stream, which bisected the site, was bridged, and connections to the public electricity and water supply networks were established (Minutes, 1948c).

The first completed structure on the campus was the auxiliary staff housing. Designed in the typology of row houses, it was built in two types – one for single occupants and another for families. Although the number of windows and other elements requiring skilled craftsmanship was reduced due to shortages, the typological innovation of its layout was indisputable. By combining a ground-floor utility space with an upper-level residential unit, the design achieves a spatial differentiation that remains legible today – both within individual apartments and in relation to the surrounding, informally developed settlement of single-family houses, with

13 For more about the new role of "sanitary" greenery, see: Čavlović, Sevšek, 2022.

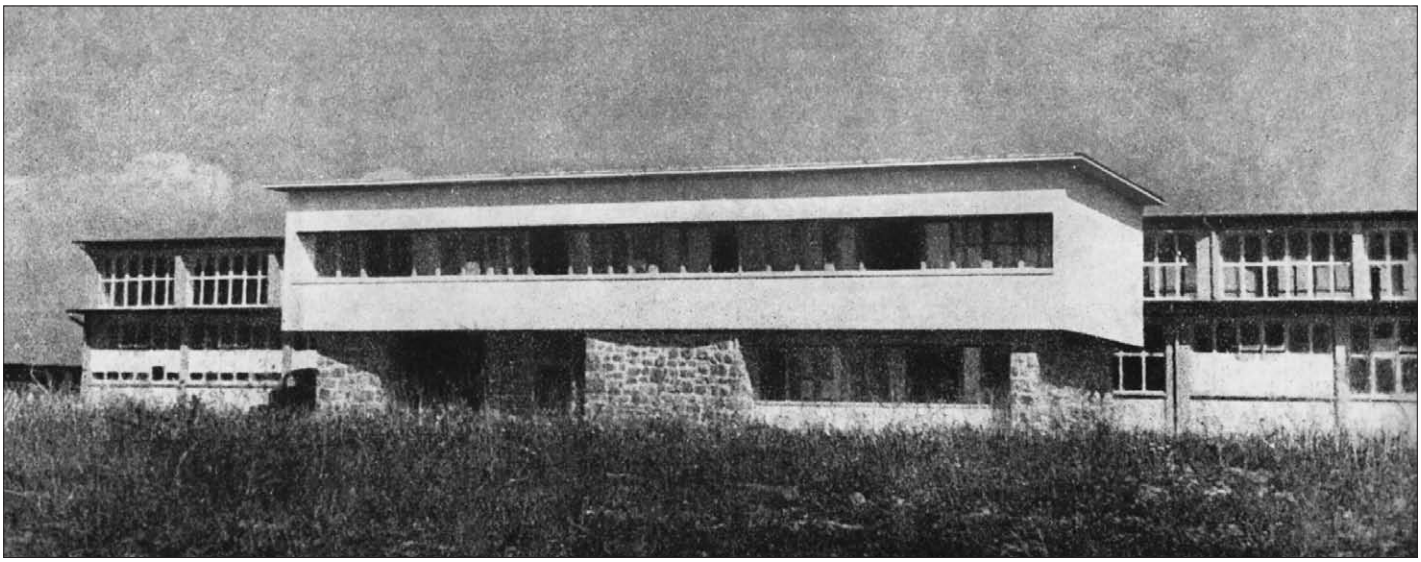

Fig. 9 The *Institute for Industrial Research*, designed by Drago Galić in 1947, was repurposed into a Motorcycle Factory and constructed at a different location

which the housing now forms a cohesive urban fabric. The rows are set at an angle to the cardinal solar orientation, allowing for the benefits of both northwestern and southeastern room exposures, while ensuring that all rooms receive natural daylight during the winter months. The first phase of the "custodian housing" was also strategically executed to integrate with the construction site itself, serving as offices, storage spaces, and worker accommodations.

The next completed structure was the Geodesy Department building. During the design process, it underwent a phase of reductions, primarily affecting the areas allocated for lecture halls and faculty offices. Its two-story, axially symmetrical composition, with elongated, single-corridor wings, responded functionally to the various segments of the teaching process (Jakšić, 2007). The primary parameter of the spatial layout is the orientation of the main rooms toward southern light, resulting in a rigorously axial arrangement that responds directly to the trajectory of daylight. However, following the abandonment of plans for the Technical Faculty at Borongaj, the building was repurposed for industrial production. Ultimately, this was the only faculty pavilion to be completed – though still unfinished at the time – and in 1949, it was handed over to the Ministry of Industry for use as an optical equipment factory, *Optika*, later renamed *Ghetaldus*.[14]

The *Institute for Industrial Research* (Fig. 9) was designed by Drago Galić in 1947 for one location but was ultimately built on a different site, closer to the Geodesy Faculty. A provisional building permit altered its original program, leading to its transformation into a motorcycle factory, completed in 1951 (Galić, 1951). The exposed materiality of the stone base, set against the refinement of the upper volume, can be read in relation to Le Corbusier's radical aesthetic shift in the 1920s, guided by what he described as "a play between crudity and finesse, between the dull and the intense, between precision and accident" (Maniaque Benton, 2009: 34).

The central campus building – intended to house the Dean's Office, the technical library, and classrooms for theoretical instruction common to all departments – remained unrealized. Designed by architect Neven Šegvić (Uchytil, 2002; Project documentation), this representative complex was to be located at the main campus entrance and serve as the institutional symbol of the Ministry of Industry. The composition is unmistakably of Corbusian lineage, assembled from formally heterogeneous elements structured through classical planning devices, a clear programmatic hierarchy, axial organization, symmetrical facades, and the distinctly Corbusian leitmotif of curved components – all of which are strategies Le Corbusier consistently employed in the design of public buildings, most notably in the League of Nations project (1927) and the Centrosoyuz (1927-28; Curtis, 2001: 86-87, 89; Moos, 2009: 231).

The design was rejected by *Project Review Commission* on the grounds that it failed to comply with the rational design guidelines,

14 The *Ghetaldus* factory operated at that location until 2007, when the plant was relocated and its buildings demolished. In addition to the Department of Geodesy, another building completed within the scope of the technical-education complex was the Mechanical Workshop of the Institute for Industrial Research, which remained under the scope of the Ministry of Industry. (Report, 1949; Letter, 1948a)

which mandated that "functional needs be met with the most economical construction methods and the smallest possible built volume" (Decision, 1948).

The project was criticized for succumbing to "formalism," which was deemed unacceptable for the 1948 construction agenda. Beyond aesthetic concerns, the rejection was also justified on technical grounds, citing the high costs of deep foundations, reinforced concrete construction, and expensive installations that required materials and equipment to be procured from abroad (Report, 1948).

Conclusion

The planning and construction procedures of the Technical Campus – even at a limited scale – reveal the challenges of conceptualizing and implementing the first postwar master document: the *Directive Regulatory Plan*. As a mega-project, the campus itself made a significant contribution to the formation of the new socio-political system – evident in its ambitious aim to establish a unified mechanism for the education and deployment of technical personnel, as well as in the sheer scale of land allocated for its realization. Its strategic importance was further reinforced by its inclusion in the Republic's First Five-Year Plan, as designated by the Planning Commission.

With the constant relocation of various programmes to available sites across the city, the *Directive Regulatory Plan* faced the challenge of accommodating functions whose designated locations and purposes often circumvented its guidelines. Reconciling competing interests proved difficult. The complexity of urban planning in these conditions was further exacerbated by frequent changes in administrative bodies responsible for its oversight. Initially, this role belonged to the *Urban Planning Department* of the *Ministry of Construction*, then to the *Urban Planning Institute* – an independent organization formed within the same Ministry – before ultimately being transferred to the newly established *Urban Planning Bureau of Zagreb*, under the jurisdiction of the city's *People's Committee*. This shift facilitated better coordination between the planning process and the simultaneous issuance of building permits. Despite these transformations within the urban planning administration, the principle of detached buildings set within freely organized park-like areas remained a consistent strategy across all early postwar urban developments – from the Technical Campus to the University City, Pioneer City, and the Sports City.

Prior to the emergence of a comprehensive and interdisciplinary model of urban planning in the mid-1960s (Kulić, 2022: 2), the conceptual tools available to architects and planners in the early postwar period were still grounded in formalist traditions – privileging compositional strategies such as symmetry, axiality, and spatial hierarchy. This legacy of formalism remained particularly evident in the treatment of both urban planning schemes and individual building projects, which were subject to revision by commissions tasked with aligning design proposals with broader agendas of economic rationalization. While urban plans were frequently limited for similar reasons, architectural projects faced even closer scrutiny, often needing to conform schematically to resource allocation logic – ultimately leading to their own process of architectural schematization.

As the epilogue of this unrealized project, fragments of its original vision remain embedded in the urban fabric of the city's eastern part. The land initially intended for the Technical Faculty and the adjacent military airfield was ultimately repurposed for industrial use.

The placement of industrial education institutions in close proximity to constructed industrial facilities is a direct legacy of the campus concept. An Optical School – today's Ruđer Bošković Technical School – was built alongside the *Ghetaldus* factory in 1960. To the north of the school, *Faculty of Graphic Arts building* was realized in 1962, both designed by Branko Tučkorić. Even today, the character of this area is defined by technical education and industrial facilities.

The ideals of the campus's early planning phase represent a rare example of a comprehensively envisioned urban ensemble within the category of thematic cities. Unraveling the various phases of this project's development is just as valuable as discussing the significance of its urban concept for understanding this early postwar period.

[Translated by Tamara Levak Potrebica; proofread by Andy Tomlinson]

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Fig. 8	*** 1947c: 116
Fig. 9	Galić, 1951: 68

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Fig. 1 Photograph of Ploče (Upper Ploče, on the left, the hotel, the cultural centre and the cinema) – A 2024 photograph

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Modern Port-Industrial Town of Ploče, Croatia
Research on Public Architecture (1952-1970)

ARCHITECTURAL HERITAGE
MODERN ARCHITECTURE
Ploče, Croatia
PUBLIC ARCHITECTURE
TOURIST POTENTIAL

Ploče is the only town in Croatia that was planned and built on the Adriatic coast as a result of social planning after World War II. As a planned port-industrial town, Ploče has been neglected in architectural research by experts and the wider public. Therefore, the subject of this research is the unexplored modern public architecture (built 1952-1970) that contributed to the transformation from a port-industrial town to a town with increasingly urban characteristics. The work is based on the research of scarce primary archival material, field research and comparison of public buildings of the same purpose built in Croatia in the same or similar time period. As Ploče has become increasingly urban over time, green areas have been analysed and arranged as one of the indicators of urbanity. Research and valorisation of the contemporary public architecture of Ploče has shown that it represents a piece of valuable Croatian architectural heritage, which has been neglected until now.

Introduction

No matter the size of an agglomeration, it must possess certain functions that confer its characteristics as a town, both in terms of external appearance and internal organization (Marinović-Uzelac, 1986: 129). Industrial functions have often caused the rapid growth and development of agglomerations. Given their historical layering, industrial agglomerations do not necessarily qualify as urban agglomerations. Therefore, one of the most challenging urban planning tasks within urban areas is planning the relationship between industrial zones, residential areas, and the core of the agglomeration. Strict zoning often causes negative consequences such as strict separation of industry from the agglomeration, while a simplified solution can cause socio-professional and economic-technical issues (Marinović-Uzelac, 1986: 129-141). A key aspect of a town's character is its center, including its functions, facilities, and traffic management. Achieving this requires the optimal sizing of areas and facilities (Maretić, 1996).

The assessment of the spatial quality of an agglomeration can be monitored through various urban indicators at the global (UN Habitat), but also at the local micro level (Mlinar, Šmit 2008; Laznibat, Šćitaroci, 2018).

In Slovenia, new towns were built after World War II, requiring engaged social planning and construction that were to take on urban characteristics from industrial agglomerations. Nova Gorica and Velenje were built that way (Di Battista 2011; Di Battista, Čelik, 2012). It is interesting how the urban visions and architecture of the newly planned town of Velenje are the basis for contemporary tourist promotion (Poles, 2013). With the construction of the port (1937-1942) along the mouth of the river Neretva and the construction of the Ploče-Sarajevo narrow-gauge railway line soon after World War II, the requirements for the planning and building of a new, modern port-industrial town of Ploče were met. Due to post-war industry development goals and the previously initiated river regulation projects on uninhabited (partly swampy and rocky) terrain, Ploče underwent heavy urbanisation and littoralisation after World War II. Ploče is the only Croatian town that was planned and constructed in the post-war period, with the goal of concentrating economic activity and population along the Adriatic coast. As a planned port-industrial town, Ploče was often overlooked by both the professional community and the general public, failing to recognize it as a valuable architectural complex. Its modern architecture, which reflects significant Croatian built heritage, remains underappreciated. This lack of recognition makes the modern architecture of Ploče – designed and constructed during its planning period – particularly intriguing and serves as the primary motivation for this research.

This paper focuses on the public architecture across a wide range of typologies built between 1952 and 1970 (Fig. 1). It briefly outlines the hypotheses and the methodological approach used to study the public architecture of Ploče.

Methodology and Aim

The aim of this paper is to systematically research and present the almost completely unknown public architecture of Ploče, to research its authorship and to record, analyse and valorise this architecture, as well as to contextualise it within the Croatian architecture of the 20th century. The unexplored potential and value of this neglected segment of built heritage was the main impetus for this research.

Various research methods were applied with the aim of integrating different sources in order to analyse the unexplored corpus of Croatian modern architecture and present it to the scientific and professional public. Initial research focused on an exhaustive study of scarce archival sources, field research, and professional and scientific literature. This created a basis for the analysis of the public architecture of Ploče and its comparison with

buildings of the same purpose that were built at the same or similar time in Croatia, especially in relation to the floor plan, design, and valuable architectural contribution. As an extension of the basic research, i.e. when the port-industrial town is characterized by a real urban space, the constitutive urban indicators for the empirical valorisation of Ploče, such as urban greenery, were analysed using an empirical method, after the basic urban indicators (water supply and sewage network and waste disposal) were satisfied. The indicators were included with the aim of assessing the quality of public architecture as an integral part of urban space and the possibility of its use by the local population. There are very few written works related to Ploče, both in Croatia and abroad. Prior to analysing the development of modern architecture in Ploče, maps and documentation regarding the regulation of the Neretva delta, urban development plans of Ploče, and aerial photographs of the bay were researched. The studied modern architecture was contextualized, analysed, and valorised within the framework of contemporary achievements and the typologically and chronologically related achievements of modern architecture (Fig. 2). This paper builds on the detailed valorisation of the urban planning of Ploče achieved in 2024 (Kranjčević, Barišić Marenić, Jelčić, 2024: 294-307). The research of modern architecture in Ploče was based on collecting and researching the original archival material (Town of Ploče, Archives; Croatian State Archives in Zagreb; Croatian State Archives in Dubrovnik, Metković Branch; Croatian Railway Museum, and a series of other institutions – libraries). The challenge lay in the very difficult research of primary archival sources because the materials in the Ploče archives are not systematically archived or organised by exact addresses, and the local Heritage Collection space in Ploče was under renovation and not accessible. Ivo Orešković made a significant contribution with an inventory list of materials (Town of Ploče, Archives). Several published books about Ploče by Ante Kovačević contributed to this research on public architecture (Kovačević, 1989, 1992, 1996, 2003). The preserved architectural documentation of Ploče is scarce, it does not cover all buildings, and even in the preserved inventory units not all documentation is complete. The rarely preserved project documentation is difficult to read due to very faded Ozalid copies of the plans, and its reproduction is complicated. The study of modern architecture in Ploče was supplemented by the field research of the urban planning and architecture of Ploče and by photographing the current state. Furthermore, thematic interviews were conducted with the residents of the town and its surroundings, with a focus on the contemporaries of the realization of Ploče. Various online sources were also researched to form a more complete picture. A challenge was that no architecture researchers have previously focused on the architecture and urban planning of Ploče, and there are very few scholarly sources available on this topic. Therefore, this paper represents an original contribution to the research of the modern public architecture in Ploče, as initial research of the material currently available.

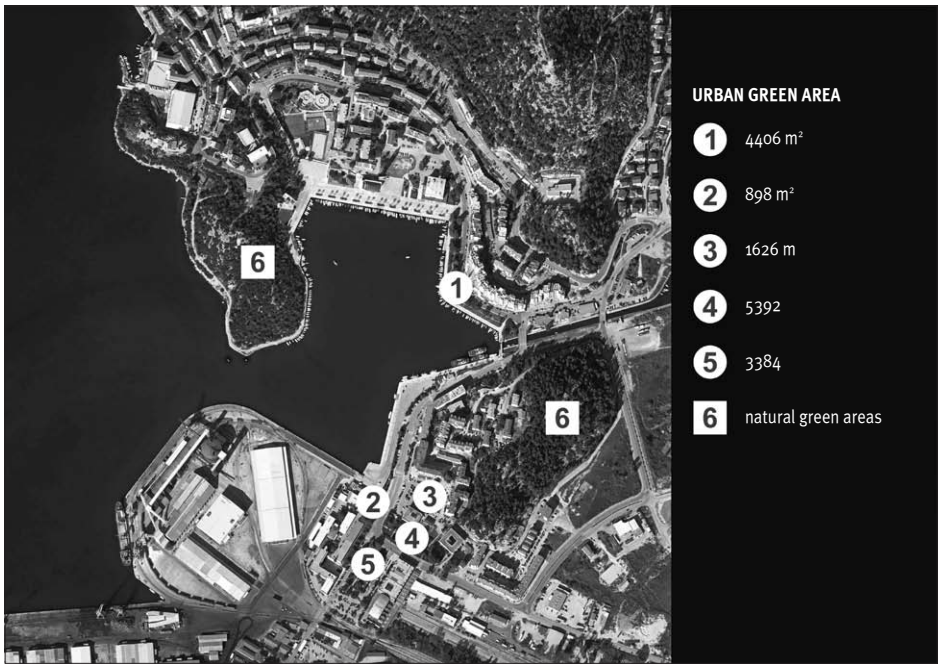

Fig. 2 Orthophoto of Ploče with indications of public buildings: (1) Cultural Centre and Cinema (former Home of the Yugoslav People's Army); (2) Ploče School Centre; (3) Tolero Hotel (Upper Ploče / Northern Ploče); (4) Health Centre; (5) Train Station; (6) Customs Office (Lower Ploče / Southern Ploče)

Urban Planning and Modern Public Architecture of Ploče

Only after the demanding regulation and reclamation of the Neretva River mouth were achieved did the construction of the port and the narrow-gauge railway along the southeastern zone of the deep Ploče Bay begin (1937-1942). The requirements for developing the urban development plans for the new modern town were then met, coinciding with the end of World War II.

Due to its specific technical and technological functions, as well as its connection to the railway line, the port necessitated specialized expertise from professionals and required tailored urban development plans and projects. After World War II, a company from Zagreb named Projekt (Smoljan, 1996) was appointed to plan a port with five piers, which have not been built to this day. Parallel to the port plans, the Urban Planning Institute of the Socialist Republic of Croatia was appointed to draft the first urban development plans

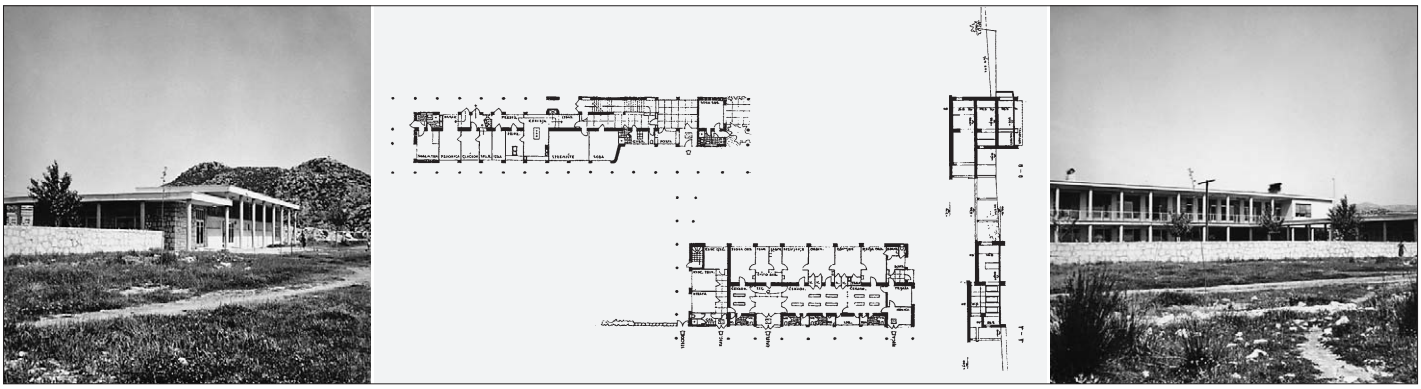

Fig. 3 Health Centre with Inpatient Clinic, so-called Port Clinic (Zoja Dumengjić, 1952-1955) – Photographs of the original condition, the ground floor plan and the cross section

for the new town with all the necessary functions (Urbanistički institut 1987, 1997).

During the conceptualisation of Ploče, two concepts were considered: linear and homogeneous type of town. Due to the terrain, the routes of roads and waterways, and other limiting factors, the idea of a linear town was abandoned. The concept of a homogeneous town was selected because of the natural environment and functional connectivity of the town. Thus, the new town was situated on the southwestern slopes of Stražnica Hill, which has a gentle amphitheatre shape, with streets and buildings most often aligned parallel to isohypses (Urbanistički zavod Dalmacije, 1973). In short, the port was situated on the flat part of the Neretva delta, and the new town was planned to the east and north of the port. In that first phase, wooden barracks were replaced by new residential buildings in the area closest to the port, on Prišnica Hill from 1947 and on Stražnica from 1950, which is yet to be researched in more detail.

After the construction of the port (1937-1942), the shores were regulated and gradually reclaimed, and the rocky terrain of the deep bay and the newly planned port-industrial town of Ploče was intensely urbanised into two spatial units colloquially called Lower or Southern Ploče and Upper or Northern Ploče. Lower Ploče is located to the southwest of the Neretva sidearm's mouth (Crna Rijeka), encompassing Prišnica and the flat terrain in the contact zone towards the southern port complex and the ferry port. The southeastern zone of Ploče Bay is dominated by the complex of the company Poduzeće Luka i skladišta (Port and warehouse company) with grand port infrastructure.[1]

Northern or Upper Ploče cover the area northwest of the mouth of Crna rijeka and the southern coast, predominantly the southern slopes of Stražnica and the western Milosavac peninsula. The public architecture of Ploče is presented in chronological order across the two sections mentioned.

Ploče is a unique modern town in southern Croatia, developed after World War II. In the short period between 1945 and 1970, a series of high-quality modern buildings were designed, i.e. realized. They were designed by renowned modern architects from Zagreb, Split, and Dubrovnik, as well as by lesser-known architects from places like Ploče, Sarajevo, Belgrade, and the like (Town of Ploče, Archives; Kisić, Mikić, 2005; Uchytil, Barišić Marenić, Kahrović, 2009).

Southern, or Lower Ploče

With the port as the motivation for building the town, the most important initial phase of building the town was the realization of typical residential buildings in the valley of Southern Ploče, facing Prišnica, to the south of the mouth of the Crna Rijeka, as well as a series of public buildings.

Health Center with Inpatient Department (Zoja Dumengjić, 1952-1955)

In the southern part of the Ploče bay, in the contact zone of the port complex and the urban tissue of the town, a health centre with an inpatient department, called Port Health Center, was built (King Tomislav Square 25). The project was commissioned by investor Poduzeće luka i skladišta Kardeljevo to architect Zoja Dumengjić[2], who worked in Arhitektonsko-projektni zavod in Zagreb and specialised in healthcare architecture. Given that hospitals were built in Dubrovnik and Split, this primary healthcare complex unifies a health center and an inpatient department with 26 beds (HR-MGZ-The Legacy of the Dumengjić Architects; Barišić Marenić; Šerman, Uchytil, 2011).[3] The dual function of the health centre for out- and inpatient care was articulated by spatial division into two parallel wings which are shifted relative to each other to provide open views for the inpatients in the western wing (Fig. 3).

The architect skilfully utilises the warm Mediterranean climate, designing semi-public communication areas as ground-level porches connected by a passageway. This reinterprets the theme of streets and shaded ground-level porches of Adriatic towns and reduces costs of heating and minimises the need for air conditioning. The upstairs inpatient rooms have a single-track layout[4], with balconies in front of them unified into a gallery. This gallery enables internal communication among patients and visitors, and offers a place for patients to meet, talk and share their worries, which supports their psychosocial well-being and healing. The ground-level longitudinal wing of the health centre features a series of parallel zones: a long high ground-floor porch, a lower section with a windbreak and sanitary facilities, a high waiting room that also serves as an internal corridor, and a series of health centre spaces. The internal waiting room is naturally well-ventilated and lit through skylights, allowing for its greater height compared to the northern clinic spaces and smaller-scale areas by the ground-level porch. The articulation of the transverse section is designed for optimal natural lighting and ventilation of the interior, critical for reducing infection risks. The humanisation of health care architecture is a characteristic of architect Dumengjić's approach from the 1950s, characterising her series of health centres built in Zagreb (in neighbourhoods Trnje /1953-1961/, Črnomerec /1953-1962/ and Medveščak /1960-1962/), Kutina /1953-1957/, Omiš /1957-1959/ and Ploče (Barišić Marenić, 2020: 84-85). By masterfully handling the constructive, functional, spatial, and design aspects of architecture, she developed an individual expression and approach that culminated in the completion of the Split General Hospital in Firule (1951-1969), her major work (Barišić Marenić, 2014: 16-27). Recent extensions[5] and the closing of the upstairs inpatient clinic gallery (Town of Ploče, Archives, sg. 14/226/429, 1997) have disrupted the original porous structure of the healthcare complex, while provisional inappropriate colour interventions have altered the original character of this modern building.

The Dubrovnik Health Centre on Boninovo today operates in a building built as the District Office for Workers' Insurance (1938) according to a design by Bela Auer and Zvonimir Vrkljan. The classical symmetrical layout, stone cladding and sloping roof reveal traditional and classical elements of architecture, while the modernist vocation of the architects is evident in the subtle details of design, spatial organization and construction. The influence of the construction cycle of health centres by Zoja Dumengjić in the 1950s and 1960s is noticeable in the realization of Zvonimir Pavešić, the Health Centre on Peščenica in Zagreb, and, for example, the realization of Žarko Vincek in Vrtlarska Street in Zagreb.

Architect Nada Šilović realized the health centre in Umag (1954), and its specificity is represented by the access ramp. Domination in the field of health architecture, or rather the construction of health centres, after Zoja Dumengjić, was taken over by Prof. Mladen Vodička in the 1960s, and his outstanding achievements are the health centres in Labin (1963-1969) and Samobor (1962-1965, 1977-1980) (Barišić Marenić, 2022: 83, 87).

Ploče Train Station (1964-1967)

The Neretva mouth was the Adriatic exit port for the continental hinterland in Bosnia and Herzegovina. The first station, reflecting traditional stone construction[6], was built in 1942 during World War II (sic!) due to the strategic importance of the Mostar-Metković (1885) and Ploče (1942) narrow-gauge railway line. (Staklarević, Štefanac, 2015). The Ploče-Metković-Mostar-Sarajevo "standard gauge" railway line (Kovačević, 1996: 98-99) was constructed between 1965 and 1967. The northern track of the Ploče railway was constructed for passenger trains, while the southern track extends to the freight port, branching for ship-to-rail transfer. The modern train station (Fig. 4; King Tomislav Square 19), built from 1964 to 1967 (Kovačević, 1996: 98; Staklarević, Štefanac, 2015: 294), is located in the south of the Lower Ploče urban area, below Prišnica and south of King Tomislav Square.

The building was designed by an unknown architect and is an exceptionally interesting

Fig. 4 Ploče Train Station under construction when the first broad gauge train arrived in Ploče and contemporary photographs of the western entrance façade and the eastern façade with the arcade

1 Compared to port activities, the industrial complexes are of a modest scale (the Kartonplast factory by architect Ivan Franic, and the Azbest factory). The Pletionica slippers factory and the weaving mill were not built (Town of Ploče, Archives, sg. 15/7/7, 15/7/21 and 15/7/23, 1961).

2 She initially realised the project between 1952 and 1954. Later, between 1954 and 1955, she supervised the construction in its final phase as part of the independent bureau Arhitektonsko-projektni biro Dumengjić (Barišić Marenić, 2020: 84-85).

3 The clinic includes a general practice clinic, a dental clinic and a mother and child counselling centre. The inpatient clinic contains a centre with 16 beds, a maternity ward with 10 beds and a section with a laundry room and supporting facilities (HR-MGZ-The Legacy of the Dumengjic Architects).

4 Located above the ground-floor wing of the clinic.

5 Konstruktor inženjering d.d. from Split, Damir Colnago 1997 (Town of Ploče, Archives, sg. 14/226/429 1997).

6 The old station was used as a restaurant from 1966 until its demolishment at the end of the 20th century (Staklarević, Štefanac, 2015: 294).

Fig. 5 Customs Office (Vuko Bombardelli, 1970) – A 2024 photograph

modern creation, a rare typological realisation of Modernism in Croatia, completely unknown to the professional and scientific community. The architectural documents are not preserved in the Ploče Archives (Town of Ploče, Archives). The train station, with a béton brut style, features a shell-like reinforced concrete structure over a two-storey waiting and ticket hall, about 15×30 meters in size. This double-curved reinforced concrete shell is a rectangular shell fragment, and it dominates the station and the surrounding area. Its grand, airy interior is enhanced by the reinforced concrete shell vault supported by two transverse arched beams and is supported at the perimeter and in the corner zones. Below the perimeter arched beams are skylights that provide natural lighting for the waiting room. The central area of the waiting room is lined with the station administration space, offices and meeting rooms. The elongated, spacious waiting room is positioned perpendicular to the tracks. On the ground floor, it is bordered to the northwest by the entrance area facing the town park on King Petar Krešimir Square, and to the southeast by the exit area leading to the porch at the southern end of the railway tracks of the train station. With the northern extension of the porch, stretching to the northeastern street, the porch is longer than 100 meters. This prominent porch or promenade is distinguished by a tectonic framework of columns and beams, with overhead lighting provided by polycarbonate arches. North of the train station, the PTT Ploče Business Facility (now Croatian Post; Town of Ploče, Archives, 14/209/390 1990; 14/216/398 1991, 14/217/400 1991, 14/218/401 1991) was added between 1990 and 1991, adjacent to the northern extension of the railway station porch.

In front of the railway station, a public town park has been arranged with a sculpture in front of the western entrance, while the eastern hypertrophied porch has been extended to the northern bus station. Both public spaces connect to the railway station building, specifically to the internal waiting area. The magnificent concrete shell of the station roof, seen from Milosavac, dominates the silhouette of Donje Ploče and is in harmony with the contours of the nearby southeastern hills south of the Neretva mouth.

After Croatia's independence, passenger traffic decreased. The station was used for passenger transport until 2013. In 2022, a seasonal Sarajevo-Ploče line was introduced, and is currently the only passenger route available. Due to disuse and a lack of maintenance, the station building has fallen into disrepair. Entry has been prohibited for safety reasons, and renovation is needed.

A contemporary project is the ongoing construction of the Žabica railway station complex in Rijeka by Studio 3LHD (web: 3LHD). The unique reinforced concrete shell vault, curved in both directions, is a rare feature in recent Croatian architecture. It is also featured in the Split project by architect Ante Kuzmanić, the Church of St. Matthew in Ravne Njive (2000-2003; Tušek, 2020: 299).

Customs Office (Vuko Bombardelli, 1970)

The Customs Office building (King Tomislav Square 26) was designed by Split architect Vuko Bombardelli in 1970 (Tušek, 2020: 30-31). It is located in close vicinity to the port. Unfortunately, the archival documents are not preserved in the Ploče Archives, and there is little published about the building beyond its date and architect (Tušek, 2018: 30-31). This late modern creation is characterised by a restrained expression, with smooth wall surfaces, vertical sliding exterior shutters, and an inverted shallow-pitched gable roof profile (Fig. 5).

The typology of customs houses within the framework of Croatian architecture has not been researched in more detail, therefore this restrained achievement of late modernism represents a rarity in the framework of professional and scientific literature.

Northern, or Upper Ploče

Northwest of the mouth of the Crna rijeka, on predominantly rocky, hilly terrain, residential buildings and social standard i.e. public buildings were built. The reclamation of the swampy area south of the Stražnica slopes created a flat terrain (now the area around Ban Josip Jelačić Square and its surroundings). Subsequently, the southern waterfront, now known as Dr. Franjo Tuđman Coast, was filled and developed.

Cultural Centre and Cinema (originally JNA Hall; unknown author, 1965-1968)

The location for the JNA Hall (Yugoslav People's Army; Silvije Strahimir Kranjčević Street 4) of the new port town was planned to be on an elevated position, west of the town's waterfront, today's Dr. Franjo Tuđman Coast (Fig. 7). The prominent position in the townscape is in accordance with the significance of the typology of the original JNA Hall during socialism. The location on the ridge of the Milosavac peninsula is like the one of the Acropolis, from which there are exceptionally beautiful views of the indented coast, the

town harbour of Ploče and the more natural western environment. The serpentine bend of Silvije Strahimir Kranjčević Street borders the location from the south, or southeast. Today, the building houses the Cultural Centre and the Mediteran Cinema. The complex is formed by two mutually perpendicular longitudinal wings connected by a connecting wing with the main entrance. The longer axis of the complex is basically an extension of the axis of Tin Ujević Street, which is located more to the north and runs northwest-southeast. The main entrance to the complex is from the northeast at the level of the high ground floor and is reached by wide stone stairs into a bright entrance hall with glazed façades. The northwestern large cinema hall is double-height, and office spaces line the southeastern hall of the cultural centre. The grand southeastern terrace offers impressive views of the town and the port (Fig. 6).[7]

The late modern representative building is dominated by a grand southern terrace above the street serpentine, sleek façade surfaces, large fenestration areas, and partial cladding with roughly hewn stone. Elements of traditional architecture in a Mediterranean climate area offer better heat protection. The architect and the exact date of this interesting work are unknown, but verbal reports suggest it was built between 1965 and 1968 (Interview, 2024). The main project for the Home of the Yugoslav People's Army access and bypass road dates to 1962. (Town of Ploče, Archives, 14/12/39 1962). Apart from the main project of the Home of the Yugoslav People's Army access and bypass road (Town of Ploče, Archives, 14/12/39 1962), documentation on the late modern building is not preserved in the Ploče Archives, and it is not documented in professional or scientific literature.

In contrast to the unexplored JNA Hall in Ploče, the JNA Hall in Šibenik (1947-1961) and in Komiža (Island Vis) stands out as an affirmed example of modern architecture (Šegvić, 1986; Premerl, 1999; Briški Gudelj, 2019; Škarić, 2012). The iconic structure by Ivan Vitić, recently renovated for the Town Library, is one of the key buildings of his oeuvre. The JNA Hall in Split was located on the waterfront in the original Ambasador Hotel by architects Josip Kodl, Vojin Simeonović, Helen Baldasar and Emil Ciciliani (1934-1937; Tušek, 2020: 123). Franjo Zvonimir Tišina's JNA Hall in Zagreb was built in 1949 in the courtyard block in Zvonimirova 12 (Šegvić, 1986: 103, 137; Grimmer, Kisić, 2005; Premerl, 1999). The prominent typology of JNA halls across Croatia was constructed on significant sites by renowned architects, which makes it puzzling why this interesting building in Ploče has not attracted the attention of the professional community.

Fig. 6 Cultural Centre and Cinema (originally Home of the Yugoslav People's Army, unknown author, 1965-1968) – Site plan with the access road, and 2024 photographs

Ploče School Centre (Mladen Frka, Olivera Bravačić, Mile Jovanović, 1966, 1969)

The Dubrovnik project team made of Mladen Frka, Olivera Bravačić and Mile Jovanović from the architectural bureau Arhitekt – projektni biro Dubrovnik designed and built a dual school centre, a high school and an elementary school in Ploče (Tin Ujević Street 3 and 5; Town of Ploče, Archives, 14/19/51 1966 and 14/21/56, 1969). The school complex is located southwest of Tin Ujević Street, of the so-called building with officers' apartments, and east of the small harbour with boats. The designers positioned the street-level wing along the street, with the areas for the performance hall, music room, library, etc. Perpendicular to it are two three-storey school wings (because of the slope of the terrain towards the western coast), which are characterised by a 50-ground layout break, enabling the southern orientation of the school wings as well as open views, and achieves integration into the dimensions of the plot of land. Unfortunately, after the construction of the southern Sports Centre in 1977 (Town of Ploče, Archives, sg. 14/80/150 and 14/81/151 1977), the views from

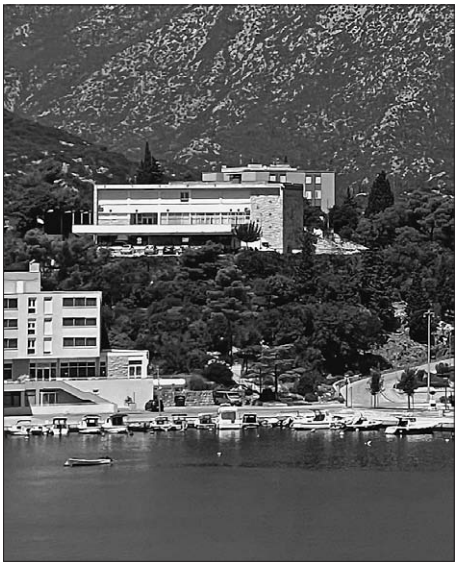

Fig. 7 Cultural Centre and Cinema (originally Home of the Yugoslav People's Army, unknown author, 1965-1968) – A 2024 photograph taken from the South

7 Shaded ground-level colonnade tucked under the terrace with steel skeleton system and stairs provides a southern entrance to a Cultural Centre wing.

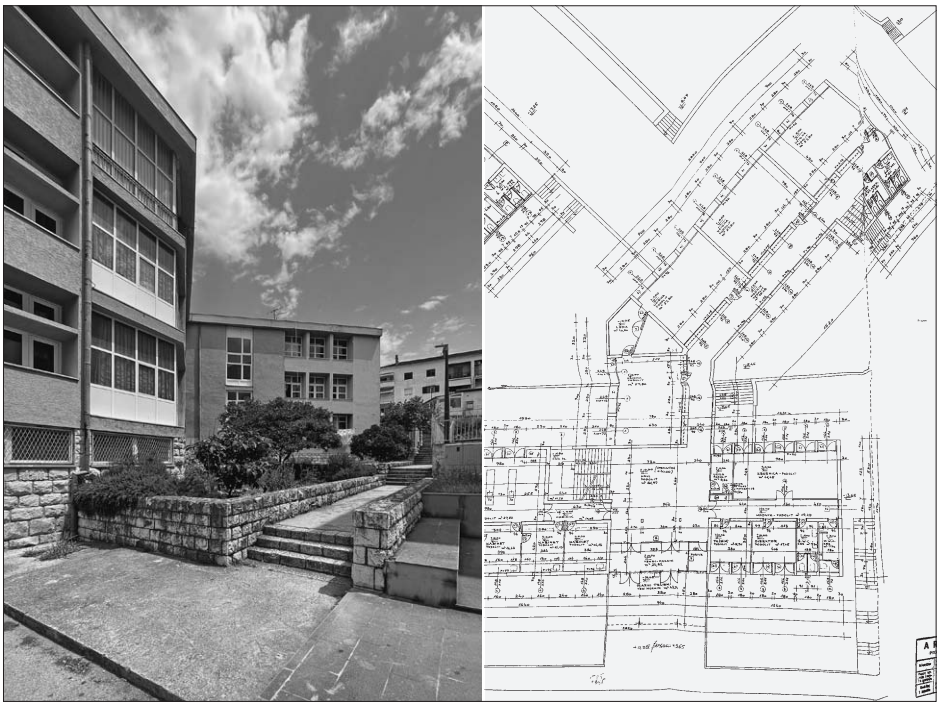

Fig. 8 Ploče School Centre (Mladen Frka, Olivera Bravačić, Milutin Jovanović, 1966, 1969) – A 2024 photograph of the current condition and the main design – Northern and entrance wing plan, 1969

the southern wing of the elementary school were lost.

A loggia is located in the bend of the school wing, creating a spatial-formal division between one southeast-oriented classroom in the west and three south-oriented classrooms in the east. The single-track school wings feature a deep zone of the southern façade with horizontal and vertical brise-soleils and niches along the bright and airy northern corridor. The entrance niche faces a classroom, while three eastern niches serve as a seating and storage area in the corridor zone, which also functions as a student lounge outside school hours. The far west corridor segment is lit from the gable, with restrooms and a secondary staircase to the north. The gable roofs of this school complex represent the intent to adapt to the climate and ensure better insulation for upper floors in the warm Mediterranean climate. Today, Fra Andrije Kačića Miošića High School operates in the northern part, and Vladimir Nazor Elementary School is in the southern part. This building has not been published in literature or highlighted in the context of the works by architects Frka, Bravačić, or Jovanović (Fig. 8).

Initially, in 1952, the unbuilt project for the Ploče Elementary School was designed by architect Zoja Dumengjić from Arhitektonsko-projektni zavod in Zagreb (Barišić Marenić, 2020: 268). The project included two school wings elevated on pillars, positioned parallel to the terrain contour lines and connected by a corridor). Additionally, two elementary school projects by architect Ivan Vitić from Zagreb remained unbuilt: the 1958 Elementary School I and the 1959 Elementary School II. These projects were not featured in the monographic edition of the Arhitektura magazine dedicated to this remarkable modern architect (Grimmer, Kisić /eds./, 2005). The 1963 school project by architects Marin Šabić and Jozef Kortus[8] from Projektni biro za urbanizam i arhitekturu – Srbija in Belgrade also remained unbuilt. Two parallel south-oriented wings connected by three corridors characterise the unbuilt design for a school in the northernmost area of Gračka Street (Town of Ploče, Archives, sg.14/14/43 1963). This deviant layout is unique in Croatian school typology. It reflects the adaptation to a constrained plot of land and the enabling the views. Similar efforts also characterise specific Antun Ulrich's 1952 Pantovčak Elementary School in Zagreb (Mikić, 2002; Begović /ed./, 2003; Mikić Brodnjak, 2002). The Maritime Technical School on Lapad in Dubrovnik (1951-1953) by architect Lovro Perković is a reference project for its indented floor plan, the removal of school wings, the sloping roof and the use of stone in the exterior (which in Ploče was used only in the base). The Catering School on Ploče in Dubrovnik (1963) is a reference for its use of horizontal sunshades that articulate the southern facade and control the strong southern sunlight (Uchytil et al, 2009: 160, 193).

Tolero Hotel (Đevahira Bašić, 1970)

The company Luka i skladište Kardeljevo commissioned the unbuilt project of the hotel and the cinema to architect Zoja Dumengjić, 1952 (Barišić Marenić, 2020: 267). The unbuilt project is characterised by an elongated two-storey base along the coast

8 Jozef Kortus (1917 Bláhov, Czech part in Austro-Hungarian Empire – 9/7/1996 Belgrade, Serbia) studied at the Czech Higher School of Architecture and Civil Engineering in Prague (1936-1939), graduated from the Architecture Department of the Technical Faculty in Belgrade in 1941. Employed in the Ministry of Construction of the FNRJ, later in the Projektni biro za urbanizam i arhitekturu Serbia in Belgrade.

9 Zoja Dumengjić (18/12/1904, Odessa, Russian Empire – 14/5/2000, Zagreb, Croatia) (Barisic Marenic, 2020: 4, 48).

10 Vuko Bombardelli (22/9/1917, Split, Croatia – 8/10/1996, Split, Croatia) (Tušek, 2020: 3; Domljan, 1989).

11 Mladen Frka (28/4/1929, Lopud – 27/7/2011, Dubrovnik) (Božo Benić Archives).

12 The Vila Dubrovnik Hotel located above the sea and contrastingly articulated horizontal white corpus of the rocky cliff of the coast south of Dubrovnik's Old Town (recently renewed following the design by Jelena Skorup Juračić and Dražen Juračić); see Juračić, Skorup Juračić, 2011: 134-145).

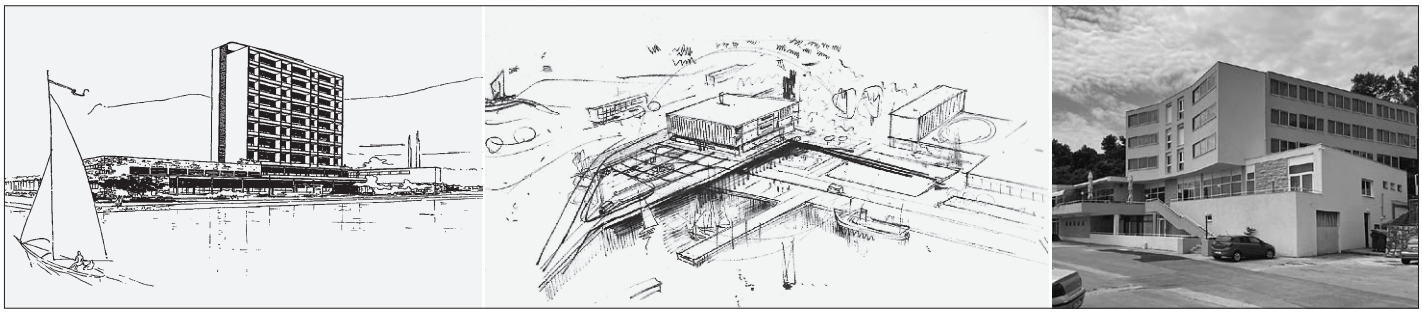

Fig. 9 Unbuilt designs of projects (perspectives of the 1952 hotel design by Zoja Dumengjić and of the 1959 design of Hotel I by Ivan Vitić) and a contemporary photograph of the built Tolero Hotel (Đevahira Bašić, 1970)

(which includes a two-storey high cinema and shared public facilities of the hotel). The stationary part of the hotel with rooms forms an eight-storey skyscraper rising above the base (Fig. 9).

Architect Ivan Vitić designed two unbuilt hotel projects in 1959. The Hotel I variant (Grimmer, Kisić /eds./, 2005: 166) features a two-storey square hotel building with an inset ground floor and a system of loggias or vertical brise-soleils on the room levels. The design for Hotel I is part of Ivan Vitić's series of hotel and motel designs along the Adriatic, including notable motels for the Sljeme agricultural-industrial company (Preluka-Rijeka, Biograd and Trogir, 1965). The hotel (King Petar Krešimir Coast IV 1) was eventually built in 1970 (Fig. 9), based on the design by Sarajevo architect Đevahira Bašić from the architectural bureau *Javor Sarajevo – Preduzeće polumontažnih i montažnih objekata – biro za projektovanje* (Town of Ploče, Archives, 14/23/59 1970). Built west of the southern waterfront, it is characterised by a wide two-storey base with an articulated eastern seafront façade, ground-floor porch, stairs, an upstairs terrace, and semi-public hotel amenities. The rooms are arranged in two wings forming a V layout with a polygonal entrance façade for the three-storey main body. The partial cladding with roughly hewn stone harmonises the Mediterranean ambiance of this building. The Tolero Hotel has not been published in professional literature, and details about the architect are unknown.

The hotel built at the foot of Milosavac Hill (King Petar Krešimir IV Coast) is characterized by a wide base in which social and public facilities are located, while the accommodation units are located vertically. The hotel can be connected in terms of design to the hotel built by the sea, the Hotel Marjan in Split (1961-1963, 1978) by architect Lovro Perković, which dominates the western coast of Split with the emphasized horizontals of the wide base (to which the Maritime Industry Building by Neven Šegvić is attached), and the high corpus of the stationary part of the hotel (Uchytil et all, 2009: 161). The Excellsior Hotel in Ploče in Dubrovnik, designed by architect Neven Šegvić, dominates the views of the old town port of Dubrovnik, and is marked by an entrance from the northern elevated road. The specificity of the Hotel Tolero in Ploče, designed by Sarajevo architect Đevahira Bašić, is marked by a tall building (V-shaped floor plan), which achieves a southern orientation of the southern wing, while the northern wing opens views to the northeast, and the west-facing rooms to the town bay.

Discussion

The specificity of Ploče, a newly planned town in southern Croatia and the exit port to the Adriatic for its hinterland in Bosnia and Herzegovina, is represented by design contributions of architects from Croatia, but also from Bosnia and Herzegovina and Serbia (Fig. 10).

The most significant contribution to public architecture is made by architects from Croatia. Architect Zoja Dumengjić[9], a graduate of the Department of Architecture at Polytechnic of University of Zagreb, head of the APZ project group, specialized in healthcare architecture, was entrusted with the building of the Health Centre. She received the highest professional awards for lifetime achievement (the Viktor Kovačić Award of the Croatian Architects' Association in 1997 and the Vladimir Nazor Award in 1995; Barišić Marenić, 2020: 217).

Architect Vuko Bombardelli[10] (1917-1996) was an architect from Split, with a degree from the Faculty of Architecture in Belgrade (1940). He obtained his first professional experiences in Belgrade (1946-1950), and his entire creative life is connected to Split (Tušek, 2020: 30-31).

Little is known about the exceptional Dubrovnik architect Mladen Frka.[11] He graduated in 1955 from the Department of Architecture of the Technical Faculty, University of Zagreb (Obad Ščitaroci /ed./, 2000: 315) and is best known for the building of the exceptionally refined modern Vila Dubrovnik Hotel in Dubrovnik.[12]

Fig. 10 Portraits of architects who designed the built public buildings: Zoja Dumengjić, Vuko Bombardelli, Mladen Frka, Olivera Bravačić, Mile Jovanović

Architect Olivera Bravačić[13] graduated in architecture in Belgrade. She lived and worked in Sarajevo (1954-1958) and then Dubrovnik for the rest of her life (Ivanović, 2021: 51).

There is a lack of published information on architects Mile Jovanović[14] from Dubrovnik and Đevahira Bašić from Sarajevo. The presence of a series of unknown architects highlights the need to continue researching modern architecture in Ploče, and to expand the research in other neighbouring countries, such as Bosnia and Herzegovina and Serbia, given that some designs and some buildings were designed by architects from those countries. Furthermore, the architects of many buildings are unknown due to incomplete documentation in the Ploče Archives (Town of Ploče, Archives).

Looking at the construction of Ploče, the majority of public buildings were designed by graduates of the Zagreb Faculty of Architecture. The phrase Zagreb School of Architecture comes to the fore here, presenting a rational approach, subtle design, as well as functional spatial solutions that emerged from the analysis of spatial data, while the design solutions were created in accordance with the genius loci. The work of Sarajevo architect Đevahira Bašić, who deviated from orthogonal schemes of public architecture, is represented by the work of the architect from Dubrovnik, while the architects based in Dubrovnik subordinated the "break" of the school's dimensions to the southern insolation of the school wings and adapted the entrance tract to the street route.

Ploče is specific because it features contributions from as many as three female architects educated in three different republics: Zoja Dumengjić, who designed the health centre; Olivera Bravačić, who co-designed the school complex; and Đevahira Bašić, who designed the hotel. This offers an opportunity to compare the styles of different schools of architecture. It also suggests that peripheral areas of the country might offer more opportunities for female architects to realize architectural designs.

A series of unbuilt designs by established modern architects and those unknown in the professional literature speaks in favour of the thesis of the need for further and more detailed research into this so far unjustifiably unexplored topic of modern architecture in the newly planned town of Ploče, which was almost entirely constructed during the socialist period. The general public's lack of awareness of the value of modern architecture is partly a consequence of the exceptionally rich heritage of historical built heritage in Dalmatia, which is the reason why modern architecture is not perceived as a form of built heritage (Tables I and II).

The transformation of a port-industrial town with growing urban features can be assessed through various urban indicators, including the analysed public architecture, to ensure the fulfilment of basic social needs such as health preservation and improvement, education, transportation accessibility (including port facilities, roads, and railways), leisure activities, and urban greenery. These indicators are considered after the primary urban infrastructure, like the water and sewage network and waste collection systems, have been adequately established. In the town itself, there are several parks with a total area of 15,706 m^2, but in addition, the Mali Milosavac hill and the Prišnica hill constitute natural greenery that is not systematically managed. Although Ploče is interwoven with stairs as public areas and greenery, due to unresolved ownership and legal relations, it is not possible to monitor the transformation of green areas as an important urban indicator (Fig. 11)

Conclusion

The results are mostly based on field research because the material in the archives is very scarce and on the available spatial indicators for the analysis of green areas.

The urban planning principles of the modern town of Ploče reflect a clear deviation from the rigid postulates of the modern town and the imperative of a southern orientation. Such an approach also marks the urban renewal of Zadar after the destruction of its old town during the bombing of the Allies at the end of World War II. The restoration of the ancient orthogonal matrix according to Bruno Milić's plan (Arbutina, 2002, 2018; Arbutina et al., 2018; Mlikota, 2021) was chosen as a means for implementation. The newly planned port and industrial town of Ploče is marked by urban matrices subordinated to the topography of the terrain, to winding streets which overcome the growth of the terrain with a route close to the terrain contour lines, and with longitudinal buildings offset with the aim of opening views to the south and the port, as well as to the provision of good insolation. Good views are an imperative of the planning disposition of the urban structure of Ploče, and they also mark the public buildings of the health centre, school and hotel, and the JNA hall. In the warm Mediterranean climate in the south of Croatia, modern architecture is enriched with porches, galleries, and terraces, which enable the use of outdoor spaces all year round. The use of modern construction techniques and materials combined with traditional roughly hewn stone cladding, given the southern Dalmatian context, characterises several public buildings in Ploče. The reinforced concrete porch system of the health centre, the steel colonnade of the JNA Hall, and the grand concrete shell of the railway station are clear examples of the application of contemporary architectural expression in the late 20th century and the use of contemporary construction technology and bold construction solutions (train station) seen in the public architecture of Ploče.

The hypotheses of this paper were confirmed. In Ploče, most of the buildings for public use were located and mostly attributed. Established or up-and-coming architects were commissioned for their designs. Although Zagreb architects such as Ivan Vitić and Zoja

Dumengjić were first commissioned in the conceptual design phase for projects such as the hotel or the school (examining the feasibility and justification of the investment, i.e. questioning programs and architectural-urban designs), in the following decades the realization was entrusted to architects from Dubrovnik and Sarajevo.

The basic characteristics of most of the researched realizations of public architecture in Ploče are the dissection of architectural complexes. Strong features are provided by planned public green areas as well as those that enrich residential areas (the subject of other research). Their characteristic is a high proportion of public space available to citizens even outside the working hours of public buildings. This undoubtedly enhanced the public space of the city. The terrain's topography influenced the horizontal division of territory and the placement of public buildings. The lack of research on the architecture of Ploče is completely unjustified considering its significant contribution to Croatia's architectural and built heritage. This paper contributes to understanding a series of significant architectural achievements in modern public architecture in small towns built in late 20th century. Since initial texts in professional literature during the realization of the modern newly planned town (*** 1955), comprehensive research has not been conducted. The architecture of Ploče has largely been absent from professional and scientific literature and thus missing from concise monographs on Croatian modern architecture (Šegvić, 1986; Uchytil, Barišić Marenić, Kahrović, 2002; Hržić, 2012). Although modern architectural achievements in Ploče are not the most prominent examples of modern architecture in Croatia, these overlooked buildings are a valuable contribution to the modern Croatian architectural heritage and the topic of Modernism in southern Croatia.

Along with Lički Osik, Ploče is one of two fully planned and realized towns in Croatia during the socialist period. Despite this specificity, this research for the first time presents five completely unknown and unexplored public architecture buildings within the framework of Croatian modern architecture. By researching and promoting the modern architecture of the port-industrial town of Ploče, awareness of modern built heritage is encouraged, along with the potential development of cultural tourism in the southern part of the eastern Adriatic coast and the diversification of tourist routes away from overcrowded historical sites.

[Translated by Prof. Ana Uglešić]

Table I Overview of the design and construction of public architecture buildings in Ploče

Public building	Year of planning / construction	Architects who participated in the design and year	Address in Ploče, status 2025
Health Centre	1952-1955	– Zoja Dumengjić, 1952	King Tomislav Square 25
Train Station	1964-1967	– unknown	King Tomislav Square 19
Culture Centre and Cinema (former JNA Centre)	1965-1968	– unknown	S.S. Kranjčević Street 4
School Centre	1966-1969	– Zoja Dumengjić, 1952 – Ivo Vitić, 1959 – Marin Šabić i Jozef Kortus, 1963 – Mladen Frka, Olivera Bravačić, Mile Jovanović, 1966	Tin Ujević Street 3-5
Customs Office	1970	– Vuko Bombardelli	King Tomislav Square 26
Hotel Tolero	1970	– Zoja Dumengjić, project, 1952 – Ivan Vitić, project, 1959 – Đevahira Bašić, project and realization, 1970	Petar Krešimir IV Square 1

Table II Overview of building surfaces and cadastral plots of public architecture buildings in Ploče

Public buildings	Number of cadastral parcels in a cadastral municipality	The surface of the construction plot (in m²)	The area of the building (in m²)	Property
Health Centre	2250	4181	417	Health centre of Ploče
Train station	2075	1769	441	HŽ Infrastructure
Culture Center and Cinema (former JNA Centre)	817	3147	1243	Town Ploče
School Centre	425	313	313	Town Ploče
Customs Office	2079/2	892	594	Republic of Croatia
Hotel Tolero	1167	4230	985 m² main building + 16 m² auxiliary building	Kavala d.o.o.

13 Olivera (Vera) Bravačić (14/3/1930, Šabac, Serbia – 25/3/2024, Dubrovnik, Croatia) (Božo Benić Archives).

14 Mile Jovanović (9/3/1902, Ristovac, Serbia – 14/5/1994, Dubrovnik, Croatia) (Božo Benić Archives).

Fig. 11 Spatial disposition of public architecture buildings

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3. Božo Benić, Private archive, Dubrovnik
4. Marin Ivanović, Private archive, Mostar
5. Milica Bravačić, Private Archive, Dubrovnik

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Zrinka Barišić Marenić, Ph.D., is a full professor and scientific advisor in a permanent position at the Faculty of Architecture. Her scientific work and teaching are focused on the research of modern and contemporary Croatian architecture, as well as industrial archaeology. She is a 2009 and 2020 laureate of State Science Awards.
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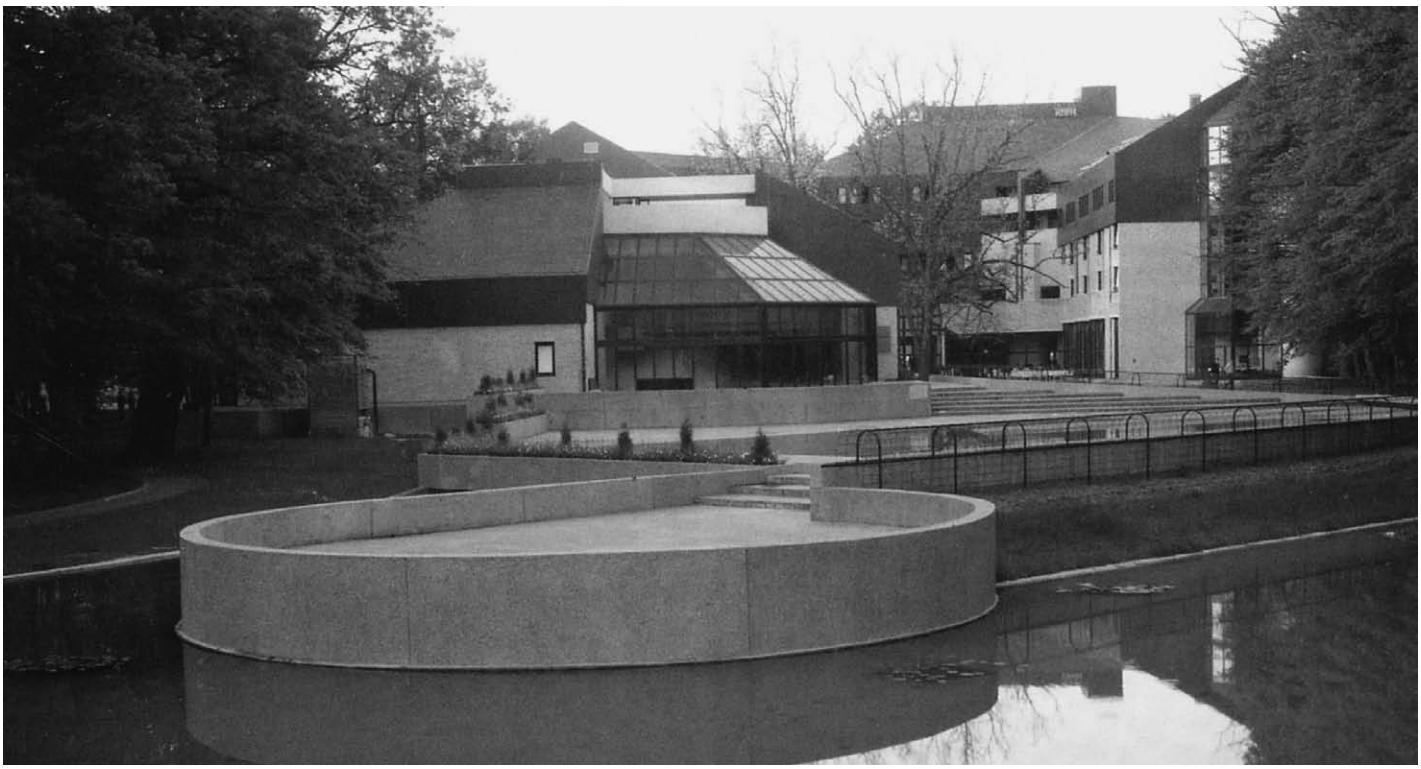

Fig. 1 SHS: The Termal Hotel in Daruvar, 1975 conceptual design, main project and 1976-1979 completed project (photograph taken after construction)

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Slavonia Hotel System

Planning and Programme Starting Points, Architectural Concept and Realization (1974-1982)

construction of tourist facilities
Croatian tourism
hotel architecture
Salaj, Matija
Slavonia Hotel System (SHS)

A project that stands out among Croatian hotel architecture of the second half of the 20th century is the unique Slavonia Hotel System (SHS), designed in the mid-1970s by a team of experts from the Urban Institute of Croatia and headed by architect Matija Salaj. The SHS project was based on the principle of standardization in terms of spatial-functional organization, architectural design, interior design, furnishing and visual communication elements as well as operation and market penetration, and was envisaged as the driving force behind continental tourism development in Slavonia and Baranja. This paper examines the planning framework, program specifications, and urban-architectural design of the hospitality and tourist facilities of the SHS (including a city hotel model in two variations, a spa hotel, and a motel) by utilizing sources from Salaj's estate and archival documentation from the Urban Institute. Notably, it includes Salaj's explanations of the SHS project and his perspectives on the features of hospitality and tourist facility architecture, as presented in professional journals and conference publications. These aspects are complemented by a review of tourism development trends in the 1970s and the characteristics of hotel architecture in market economy.

INTRODUCTION: POST-1970 TRENDS IN TOURIST FACILITY CONSTRUCTION AND ARCHITECT MATIJA SALAJ

In the architectural output of the Yugoslav socialist era, hotel architecture particularly stands out due to its high-quality design solutions and the diversity of authors' approaches. Starting in the 1970s, the architecture of hospitality and tourist facilities experienced significant growth, influenced by global architectural trends and the expansion of international tourism.[1] Similarities between certain domestic and international accomplishments in hotel architecture highlighted the development trends in Yugoslav and Croatian architecture. Concurrently, trends in the tourism market, expectations of foreign guests, and the tourism potential for generating a steady inflow of foreign currency required that the hotel industry and the construction of tourist accommodation align with international standards (Antešević, 2022: 425-430). Backed by international loans, tourism emerged as one of the country's development objectives. The period from 1965 to 1975 is referred to as the golden age of tourism in Croatia, as nearly 70% of all basic accommodation facilities available in the country by the end of the 1980s were constructed during this time (Vukonić, 2005: 153-154, 156). Years of investor preference for tourism investment along the coast caused the continental regions, particularly cities, spa towns, and mountain areas, to fall behind in tourism development. Although the potential of continental areas for tourism was acknowledged in the early regional plans that were initially developed for these regions (such as the 1958 Krapina District Regional Spatial Plan; the 1963 Spatial Plan for the Development of Tourism and Recreation in the Catchment Area of the Zagorje Main Road; and the 1966 Regional Spatial Plan for the Development of Slavonia Tourism and Recreational Centres), the Adriatic coast remained more attractive for investment, leading to a concentration of tourist facilities in that area. In the planning documents for Slavonia, the largest continental region, tourism was designated as only the third developmental priority, following agriculture and industry. Consequently, this paper investigates how tourism development in Slavonia was perceived through planning-program concepts, spatial plans, and architectural projects at the regional level, as well as whether this approach led to the realization of built architecture. The core of the research relies on identifying spatial plans and architectural projects located in the Croatian State Archives in Zagreb, newspaper articles, and other relevant literature, aiming to gain insights into the spatial and architectural solutions of that era.

When designing tourist architecture, architects were increasingly guided by the question: *What impression and experience should hotel architecture provide its users with*?[2] The hotel was viewed as an object of consumption that needs to find its way to users, and to achieve that, architects did not shy away from irrational design solutions.[3] With the weakening of modernist influences, city hotel architecture, which had a foothold in

1 After the Second World War, the concept of socially planned tourism development was employed not only in Yugoslavia but also in the neighbouring Central and Eastern European socialist countries. For more, see the recent literature: Stefan, 2022 (Romania); Rosenbaum, 2015 (Soviet Union); Bachvarov, 1999 (Bulgaria); Balcerzak, 2021 (Poland); Light et al., 2020 (post-war changes in tourism development in Central and Eastern Europe), and others.

2 For more details on the modern tradition of Croatian tourist architecture and hotel architecture on the Adriatic see: Mrduljaš, 2011: 33-45; Kulić, Mrduljaš, Thaler, 2012; Mrduljaš, Kulic, 2012; Mrduljaš, 2013: 171-207; Šerman, Mrduljaš, 2016: 1056-1062; Mrduljaš, 2018a: 164-189; Mrduljaš, 2018b: 78-83.

3 Architect Boris Magaš, explaining the concept of the hotel building, says that the functional organization of the hotel consists of three basic components (accommodation-individual tract, social-public tract and service-administrative tract), whose mutual relations form the structural scheme of the hotel, and in that regard we distinguish the following basic types of hotel facilities: a vertically developed facility on a horizontal tract and its horizontal variant, atrium, terrace, pavilion and block hotel (Magaš, 1997: 604).

4 With the purpose of exchanging experiences and discussing issues in the realization of hotel architecture from all republics, expert meetings or symposia were occasionally organized.

functionalist rationality for much longer due to characteristic urban conditions, gradually acquired postmodernist features during the 1970s, expressed through form associations, spatial conceptions and new materialization possibilities (Anteševi, 2022: 479-495, 553-570). City hotel architecture thus started abandoning conventional functionalist models of hotel amenity organization, giving way to form-refined functionalism or aestheticized regionalism.[4] Many investors, having found a foothold in congress tourism, adapted their programmes for the construction of city hotels to new functional needs, including more commercial amenities.

A prominent name among Croatian architects who actively designed tourist facilities as well as contributed notably through professional articles, analyses and conference papers on aspects and problems of the construction of tourism facilities[5] is that of Matija Salaj (1932-2014), with hotel architecture as his specific area of expertise (Fig. 2).[6] Salaj worked for three decades at the Urban Institute of Croatia, where he either led or participated in the development of numerous spatial and urban plans for tourist areas in Croatia and other former Yugoslav republics (Bosnia and Herzegovina, Serbia, Montenegro), and was also the author or co-author of architectural projects of several hotels, motels and catering facilities in Croatia. Notable realizations of hotel facilities on the Adriatic, of which he was either the main designer or one of the authors, include the Maestral Hotel in Brela with its annexes Mirna and Marina and hotels Mediteran and Galijot in Poreč. However, the project that stands out is the complex and comprehensive project for the Slavonia Hotel System (SHS), a chain of hotels that Salaj conceptually designed and developed together with his colleague Zvonimir Krznarić (1938-2011). Before the creation of architectural projects of established types of SHS hotels and motels for designated locations, a study was made to analyse programme indicators and basic models of the system and accommodation capacities.

Starting from the new market-oriented organizational forms in tourism and hotel industry, as well as the spectrum of resources for tourism development in the continental part of Croatia, which was neglected compared to the Adriatic coast, the Urban Institute of Croatia, in cooperation with the Interest Community for the Development of Hospitality and Tourism for Slavonia and Baranja[7], launched at the end of 1973 activities for designing the SHS project with the goal of developing a network of tourist accommodation facilities in Slavonia according to the established priorities of tourist development. The Resolution

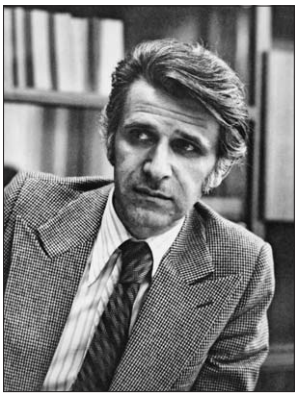


Fig. 2 Architect Matija Salaj (photograph from 1970s)

5 Over time, some architects specialized in the design of hospitality and tourist facilities and became leading experts and consultants in the field, such as Ante Rožić, Matija Salaj, Julije De Luka, Zdravko Bregovac, Boris Magaš, Andrija Čičin-Šain, Lovro Perković, Miroslav Begović, Žarko Vincek, Rikard Marasović, Jerko Rošin and others.

6 **Matija Salaj** (Vukovar, 15 December 1932 – Zagreb, 5 June 2014) attended elementary school in Zagreb (1943), secondary school (Real School) in Vukovar (1951), and graduated from the Faculty of Architecture and Civil Engineering of the University of Zagreb (1958). He wrote his graduation thesis on the topic of hotels in Zadar under the mentorship of Professor Mladen Kauzlarić. From 1958 to 1962, he worked in the project bureau *Suradnik* in Makarska; from 1962 to 1991 he worked in the Urban Institute of Croatia in Zagreb, first as an independent designer (1962-1982), then as an advisor and director of the Institute for Detailed Planning and Architecture (1984-1988). He was the head of the tourism centre since June 1976. Since 1986, he was a lecturer at the postgraduate study Economics of Tourism at the Faculty of Economics of the University of Zagreb. He served as director of the Institute for Spatial Planning at the Ministry of Environmental Protection, Spatial Planning and Construction of the Republic of Croatia on two occasions, 1991-1999 and 2004-2006. After a series of engagements at the *Suradnik* bureau, which entailed work on urban and architectural solutions, mainly hotel, residential, business and administrative buildings, tourist zones and resorts, he intensively worked at the Urban Institute of Croatia on the development of (regional) spatial plans and tourism development programmes (for Slavonia, Istria, Pula, Makarska, the island of Cres, the Vrbas estuary, Šara and Prokletije), general urban plans (of Makarska, Baška Voda, Tućepi, Slavonska Orahovica and others), detailed urban plans for several cities and towns, most often for central city zones or for the construction of individual buildings or complexes, special studies (Slavonia Hotel System), and programmes, detailed urban plans and projects for tourism and recreation complexes (Makarska, Poreč, Mali Lošinj, Trogir, Imotski, Vukovar, Daruvar, Lipik Dečani, Brezovica, and Egypt and Tanzania in Africa). He is the author and equal co-author of several conceptual solutions, competition projects and detailed designs for tourist accommodation and hospitality facilities (hotels, auxiliary buildings, motels, restaurants) in Makarska, Brela, Podgora, Omiš, Zadar, Poreć, Dubrovnik, Zagreb, Virovitica, Vukovar, Daruvar, Beli Manastir and elsewhere, as well as other buildings for residential, business, administrative, cultural and sports purposes in Makarska, Borovo, Zagreb, Samobor, Vukovar and elsewhere. Some of Salaj's most significant realizations are: sports centre and school DTO Partizan in Zaostrog (1961); Mirna hotel pavilion in Brela (1963), co-authors J. De Luca and A. Rožić; Vućedol restaurant in Vukovar (1963); Maestral hotel in Brela (1965), co-authors J. De Luca, A. Rožić and B. Bernardi; cinema theatre in Borovo (1966); Franciscan Grammar School in Samobor (1969), co-author E. Seršić; church in South Zagreb (1971-81), co-author E. Seršić; Mediteran Hotel in Poreć (1971); Termal hotel in Daruvar and Dunav hotel in Vukovar (1979), co-author of the preliminary design Z. Krznarić; Galijot hotel in Poreć (1981); reconstruction of the Mimara Museum in Zagreb (1987), co-authors M. Kranjc, I. Piteša and B. Šerbetić. From 1959 to 1990, he participated in about twenty public and invitational architectural and urban planning competitions. He won several awards and professional recognitions. This summary of M. Salaj's biography was compiled on the basis of Salaj's autobiography, list of works and bibliography from January 1989, kept as the family legacy in Zagreb (MSL).

7 The newly emerged social and economic conditions led to the establishment of the Community of Interest for the Development of Hospitality and Tourism for Slavonia and Baranja in 1973.

TABLE I OVERVIEW OF ACCOMMODATION FACILITIES OF THE SLAVONIJA HOTEL SYSTEM

No.	Name of the hotel	Location	Project Year	Type/ model	Number of beds	Realization	Floor Plan
1	–	Đakovo	1977	GH	100	no	compact
2	–	Slavonski Brod	1978	GH	300	no	compact
3	„Dunav”	Vukovar	1979	GH	100	yes	compact
4	„Slavonija”	Vinkovci	1979	GH	100	yes	compact
5	„Park”	Našice	1980	GH	100	yes	compact
6	–	Beli Manastir	1975	TR	60	no	dispersed
7	–	Satnica/Valpovo	1975	TR	50	no	compact
8	„Sava”	Jasenovac	1977(?)	TR	50	yes	dispersed
9	„Borik”	Donji Miholjac	1979	TR	50	yes	dispersed
10	„Termal”	Daruvar	1976	LH	250	yes	dispersed
11	„Lipik”	Lipik	1978	LH	250	yes	dispersed
12	-	Sredanci	1976	M	100	no	dispersed

City hotel (CH); Tourism and recreation hotel (TR); Spa/healthcare hotel (SH); Motel (M)

on Economic Policy and Measures for Further Implementation of the Social Development Plan of Yugoslavia from 1966 to 1970 gave certain priority to investments in economically underdeveloped republics and regions (AY, 130-748-1206).[8] With the adoption of amendments to the constitution, followed by the change of the SFRY[9] Constitution in 1974, numerous economic functions previously held by the federal government were transferred to the republics, autonomous provinces and local governments, leaving it up to them to decide on the pace and direction of tourism development (Mandarić, 1965: 3; Nešić, 1972: 112).

PLANNING AND PROGRAMME STARTING POINTS FOR THE REALIZATION OF THE SLAVONIA HOTEL SYSTEM

Activities of the Urban Institute of Croatia for the planning and programming of tourism and hospitality development and construction in Slavonia and Baranja date back to the 1960s, when the Institute was in charge of drafting the long-term Regional Spatial Plan for the Development of Slavonia Tourism and Recreational Centres (1966).[10] This higher-level plan has since become the basis for the development and processing of individual tourist sites and the basis for adopting medium- and short-term development plans. Tourism in Slavonia, based on continental resources such as nature, gastronomy, sports, mountaineering, spa resorts, cultural heritage, etc., was planned as an additional activity at the local and regional level (Kranjčević, Stober, 2023: 650, 653-654). Analyses showed that Slavonia did not have a primary tourist area where a higher concentration of tourist facilities could be built in one place (Stipančić et al., 1975: 59). With the development priority given to agriculture and industry, tourism was a tertiary area and the supply was poor. Looking to approach the planning of tourism and hospitality industry in Slavonia and Baranja in more detail, preparations were soon underway for the Plan and Programme for Tourist Development of Slavonia and Baranja Priority Sites from 1971 to 1975. After this Plan and Programme was adopted, further steps were taken regarding specific realizations aimed at improving the tourism supply. Not only did transit routes and economic centres of the region generally lack adequate facilities to accommodate tourists, but they also lacked tourist capacities and city amenities for the local population, to meet the needs of internal or “low-intensity tourism” as it was also called.

Based on the experience in preparing fundamental planning documents for the development of tourism and individual urban projects initiated and led by the Urban Institute, the need for a complex “reconstruction” was recognized, not only regarding the tourist offer of Slavonia and Baranja, but also regarding the role, tasks and operation of the hotel industry in such an area (EMS, Salaj, 1982). Under the Regional Spatial Plan for the Development of Slavonia Tourism and Recreational Centres, the region was divided into three basic areas – districts (Posavina District, Mountain District and Danube-Drava District). For each district, distribution was made in line with its tourist potential – tourist recreation centres; spas and health tourism centres; transit points; and hunting and fishing points (Kranjčević, Stober, 2023: 654). Optimal placement of tourist facilities emerged as one of the special problematic aspects of tourism planning in the spatial scope of the receptive region (Čomić, 1983: 55-65).[11] If there is an area that requires all

8 AY, 130-748-1206: Information on submitting a request for a loan to the International Bank for Reconstruction and Development, Belgrade, October 15, 1969.

9 Socialist Federal Republic of Yugoslavia

10 The legal basis for the preparation of spatial plans and the implementation of regional development projects in Croatia was the Urban and Regional Spatial Planning Act, first adopted in 1961, with later amendments, the most important of which were amendments from 1966 and 1969. According to the provisions of the Act, regional and urban plans were drawn up for a period of at least twenty years, subject to revision every five years, due to the variable nature of social development plans. See in: Urban and Regional Spatial Planning Act, Official Gazette of SR Hrvatska, No. 21 from 1961. For more details on the position of tourism in regional development and spatial planning, see: Andrić, 1977: 11-28; Kranjčević, 2021: 1183-1207.

forms of human activity to be harmonized with natural potentials, it is the planning of spatial and economic development of tourism (Kiš, 1977: 44). Therefore, choosing the right place for the construction of a tourist facility was considered as one of the first prerequisites for the appropriateness and success of an investment venture and a series of qualities (Mitrović, 1970: 2). Fedor Kritovac, an architect and architecture critic, said in the early 1970s that the design of tourism, viewed as an organized system, provides an opportunity to realize, at least to an extent, the vision of shaping the entire environment when designers opt for an integrated approach (Kritovac, 1971: 18).

Led by the fact that hospitality and tourism facilities are a fundamental and characteristic receptive factor of every tourist area, influencing tourism types and forms and its economic effects, a team of experts from the Urban Institute, headed by Matija Salaj, designed the Slavonia Hotel System model[12], based in essence on the international hotel chain concept in terms of operation and market penetration as well as in terms of design, furnishing and amenities of accommodation and hospitality facilities. Designing a hotel chain[13], initially for one region, but with a view of expansion on the national and international markets alike, stems from the Urban Institute's experience in tourism development planning and from observing changes on the tourist market in the social planning domain. Transformation of hotel companies was one of the outcomes of the global expansion of tourism in the 1970s, and the SHS project represented a current solution for the timely introduction of new forms in hotel operation and offer. For the SHS, a significant role was played by the Regional Spatial Plan, the 1973 Spatial Plan of the Socialist Republic of Croatia – Tourism Economy and the Basic Aspects of Long-Term Tourism Development in Yugoslavia. The defined starting points served as the basis for determining macro-locations and the capacity of facilities within the Slavonia Hotel System which was the first case of hotel and hospitality organization integration at the regional level in Yugoslavia (Fig. 3).[14] Authors of the project believed that a hotel system like this was important for domestic construction enterprises, equipment manufacturers and trade networks of a number of complementary activities.

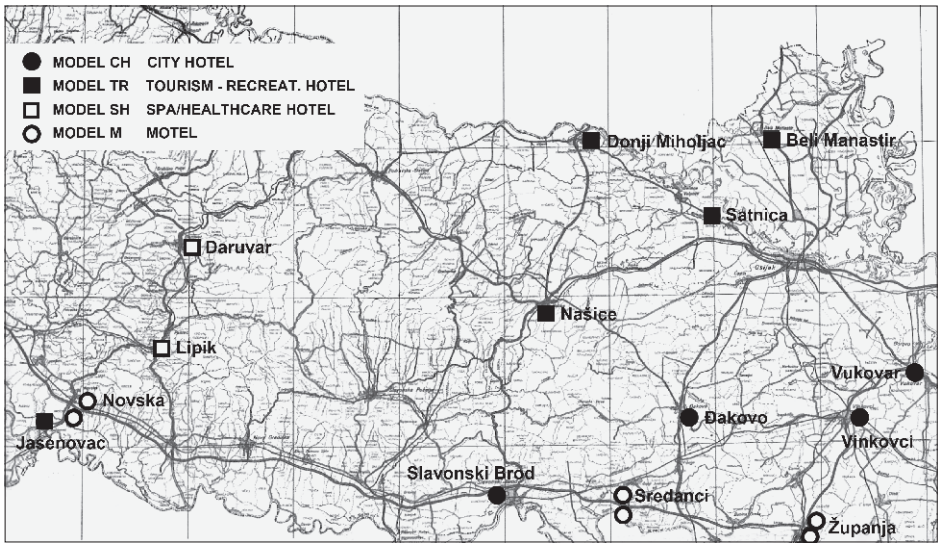


Fig. 3 Map of Slavonia and Baranja with the disposition of basic hotel models by towns, 1974

Slavonia Hotel System Facilities Architectural Concept and Their Construction

While a more active construction of tourist facilities in Yugoslavia began at the end of the 19th and the beginning of the 20th century, proper investment experiences were gained, according to architect Jerko Rošin, only from the mid-1960s, when tourism in Yugoslavia took on the contours of modern international tourism (Rošin, 1977: 372). Such a status inevitably raised the question of tourist architecture range and scope, for its goal was no longer simply to provide accommodation and basic services during a holiday, but also to create an atmosphere, an intimate human environment, a lucid rationality in the use of space, and in particular a connection with the landscape (Rošin, 1977: 374). Hotel architecture, built as the result of the planned construction of tourist facilities and extensive investment programs, gained special importance, balancing between global architectural practice and regional characteristics adapted to tourist presentation. For that reason, typological changes had to be introduced so that the amenities of new tourist

11 A receptive region was considered to be a planning-programme polarized tourist-geographical region in which tourism is dominantly represented.

12 Ante Stipančić and Boris Vukonić, both holding a master's degree in Tourism, participated in the elaboration of the project along with architects M. Salaj and Z. Krznarić.

13 A hotel chain represents a technologically and organizationally uniform and market-affirmed hotel company, with a recognizable business style and brand that operates on the domestic or international market (Svorcan, 2009: 57).

14 The framework programme for the development of project and investment documentation was determined during meetings held on December 12, 1973 in Osijek and January 11, 1974 in Vinkovci, while the final definition of capacities, especially in terms of transit needs along the Belgrade-Zagreb highway section, was discussed at meetings held on January 23 in Slavonski Brod, and later on January 30 and February 11, 1974 in Zagreb (Salaj et al., 1975: 16).

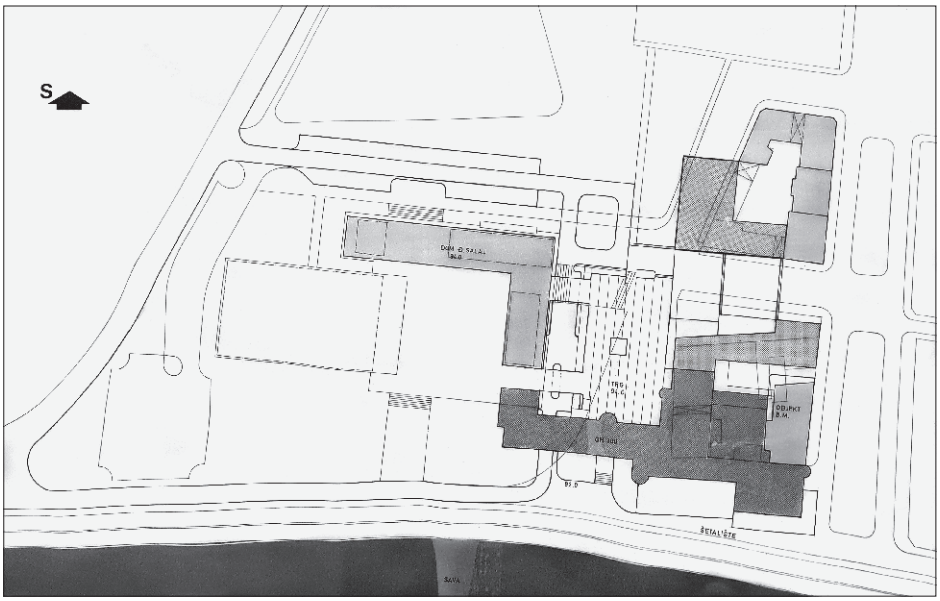


FIG. 4 SHS: HOTEL IN SLAVONSKI BROD (SECOND CONCEPTUAL DESIGN), 1978, SITUATIONAL PLAN

FIG. 5 SHS: BORIK HOTEL IN DONJI MIHOLJAC, 1975 CONCEPTUAL DESIGN, MAIN PROJECT AND 1979 COMPLETED PROJECT, INTERIOR OF THE HOTEL BAR

facilities would meet the individual needs of tourists and give them an adequate choice of places for holiday. Salaj believed that the architecture of tourist facilities should, through its design concept, spirit of form, and attention to detail, radiate joy and a sense of abundance. It should foster a connection with the heritage of its surroundings and provide an ongoing sense of novelty and unexperience. Only when understood in this manner does it acquire a new quality function within the context of the new functionalism of leisure usage, specifically the aesthetic-perceived function (psychofunction) of a space intended for relaxation (Salaj, 1982b: 10).[15]

The typological conception of SHS tourist facilities was impacted by the heterogeneous demand on the Slavonia and Baranja tourist market, evident through four groups of services – for business visitors, residential visitors, transit visitors and medical tourism. The authors, accordingly, proposed three basic facility models for the SHS: 1) a city-type hotel in two variants – a city hotel (CH) and a tourism and recreational hotel (TR) for business and residential visitors; 2) a spa/healthcare hotel (SH) – located in well-known spa centres of Slavonia, complete with medical facilities; 3) a motel (M) – located on transit traffic routes, for visitors to stop and rest during their journey.[16] Following a market study, prepared using the three facility models, three groups of accommodation capacities were determined: 1) 60-80 beds; 2) 100-120 beds; and 3) 250-300 beds (Stipančić et al., 1975: 43b-61; Salaj, 1982c: 21).[17] Originally, the SHS project should have included 16-18 locations – most of them for city hotels and tourism and recreational hotels, followed by motels and two locations for spa hotels (Salaj, 1982c: 22). From 1975 to 1977, conceptual architectural projects were prepared for the following 13 locations: city hotels and tourism and recreational hotels in Slavonski Brod (1975), Beli Manastir (1975), Donji Miholjac (1975), Jasenovac (1975), Satnica Fishpond (1975), Vukovar (1976), Đakovo (1977) and Našice (1977), spa-type hotels in Daruvar (1975) and Lipik (1977), and motels on the Zagreb-Belgrade motorway (double motels near Vinkovci and Županja – 1975 and at the Sredanci location near Slavonski Brod – 1976) (Milas, 1997: 171-205).[18] For the hotels in Vinkovci, Beli Manastir and Daruvar, and the typical motel on the motorway, which were taken as typical examples, mock-ups were produced and their photographs were presented in the SHS basic model study (Stipančić, Salaj, Krznarić, 1975). Of the entire investment and construction plan, five facilities were built from 1977 to 1982, namely: spa hotels Termal in Daruvar (1976-1979) and Lipik in Lipik (1978-1982) and city hotels Borik in Donji Miholjac (1979), Dunav in Vukovar (1979-1980) and Slavonia in Vinkovci (1979-1980).[19] In 1978, new conceptual design was prepared for a city hotel in Slavonski Brod, also within the SHS, but probably at another location – by the promenade along the Sava in the central city zone, to complete that space urbanistically and architecturally (Fig. 4). The partially interpolated hotel building was meant to complete part of the unfinished block of historicist architecture with the Brlić House and create a connection with the Đuro Salaj Memorial House, built behind on a wider area to a design by Zagreb architects Marijan Haberle and Minka Jurković (Haberle, 1976: 78-82).[20] Building on the ur-

15 One of the first architectural competitions in which Matija Salaj participated as a young architect, in a team with colleagues Emil Seršić and Ljubica Seršić, was the competition for a city hotel in Virovitica, announced in 1965. The internal competition in the second phase, after the evaluation of projects received during the public competition, ended with Salaj and Seršices in the first place. In addition to a series of shortcomings, spatial-urbanistic qualities of their project were highlighted, manifested in the possibilities of dialogue with the environment (Rakić, 1965: 60, 62). The hotel was opened in 1971 under the name Slavonia. Salaj is also the author of the project for the development of the Vučedol tourist and recreation zone close to Vukovar, within which a restaurant was built by the Danube in 1963 according to his project. Two years later, Salaj also worked on the conceptual design of the Vučedol hotel in Vukovar.

16 Construction of tourist accommodation establishments was usually defined by a network plan divided into three main phases: the first consisted of the preparation of a pre-investment study, the second of the preparation of a directive programme, preliminary design, investment programme and project documentation (main project and detailed design), while the third phase included the selection of a contractor,

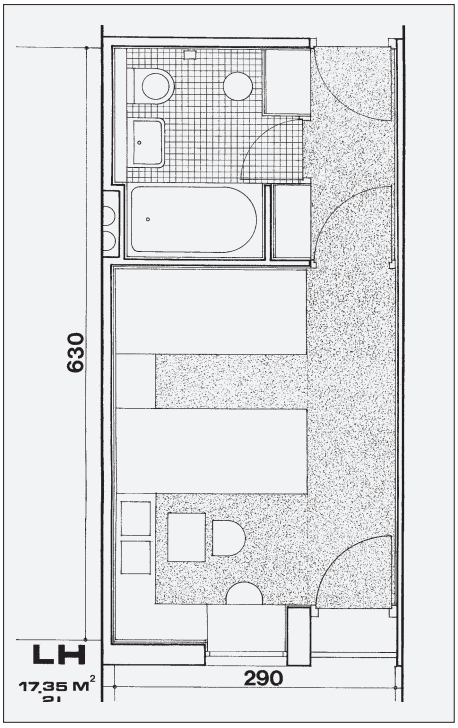
ban setting of the memorial house, designed in the high modern architecture, Krznarić and Salaj formed a smaller square between the memorial house and the hotel and connected it with the main city square.

Basic characteristics of SHS accommodation and hospitality facilities should have been visible in their typification and unique market penetration. In the organizational-functional and form-architectural sense, this implied certain common features – location, architectural processing, interior design, furnishing of public spaces and rooms (furniture, lighting fixtures, textiles, ceramics), technological equipment, visual communication standards (logo, typography, colour, etc.), service standards and types of food and beverage served. All models of SHS facilities, architecturally designed by taking into consideration the characteristics and conditions of a specific location (height regulation, dimensions, volume fit into the existing urban fabric or natural environment), have many common elements and form-spatial solutions stemming from the established standards. The design features of the SHS are visible in the consideration of regional characteristics and the application of identical or similar architectural elements, the applied constructive grid, spatial-functional organization, arrangement and furnishing of interior spaces, public amenities' relation to landscape and urban space, design of installations and typification of rooms in terms of dimensions, equipment and the finishing treatment. Describing the basic principle in designing modern hospitality and tourism facilities, as well as the role of the architect in that process, Matija Salaj emphasized that "to build spaces and facilities for rest and leisure obliges architects as participants in that construction to fulfil two conflicting requirements: for the hotelier, to create a functional-technological plant-factory, a machine that will work and for the tourist, to create an environment in which they will feel more beautiful, better and wealthier than in their own home, a space humanized and stimulating for new experiences, meetings and relaxation" (Salaj, 1982a: 85).

The main design element, characteristic of all SHS facilities, is the pitched roof – a typical motif of Slavonia and Baranja's regional architecture, born from the specific climatic conditions of the area and functional needs. The dark tones of the roof covering, made of Eternit panels which were used in most designs also for the last floor in the form of a vertically lowered roof, were meant to be integrated into the environment, either into the existing urban settlement or the natural landscape, as well as to create an impression of smaller dimensions (Fig. 1). The roof motif complements the design principle of organizing amenities in a loose dimension. This affected the overall form and the elaborate appearance of the facades. To that end, but also to make the construction rational, in certain SHS buildings, except for larger or more compact hotels with a smaller capacity (Vukovar, Vinkovci, Slavonski Brod, Daruvar, Lipik, Satnica Fishpond, Našice), the accommodation tract was designed as a separate unit to avoid the problem of the service floor (Beli Manastir, Donji Miholjac, Jasenovac, motel on the motorway). Since public space amenities were located at different levels, by function and manner of use, the experience of an integral space was visually accentuated by smaller groups. The visible roof structure of interior spaces with public and service functions enabled many variations for individual groups/ensembles (Stipančić et al, 1975: 8). Monotonous spaces were thus avoided and certain motifs and elements accentuated (Fig. 5). For the facades, amber and red facade bricks were chosen, being a typical and traditional building material of the Pannonian Region. Entrances to buildings are artistically emphasized with stripes, and circular perforations are also used in wall panels (Fig. 6). One of the characteristics of the architectural concept is the integration of the landscape or urban space with public spaces and facilities, primarily hotel facilities, to emphasize, according to the author, "the humane component of the man-space relationship" (Stipančić et al., 1975: 7). In designs, this was solved by penetrating the green areas inside the building and by guiding views towards a more picturesque and high-quality outdoor space. In addition, the water element on the ground floor, right next to the building, was

Fig. 6 SHS: Termal Hotel in Daruvar, 1975 conceptual design, main project and 1976-1979 completed project, façade segment

Fig. 7 SHS: Double room model for the spa hotel in Daruvar, 1975



execution of works, supervision of works and a handover – technical inspection and acceptance of the building (Carevic, Šimičic, 1988: 288).

17 Number of beds: city hotel – 60, 100, 300; tourist-recreational hotel – 25, 50; spa hotel – 250; motel – 50, 100.

18 Although, according to the programme, a hotel was also planned for the location in Valpovo, there is no record of conceptual design for it, neither among the archival documentation, nor in the 1989 list of Salaj's works. Given that Satnica Fishpond is very close to Valpovo, it is possible that a project was prepared only for the hotel at Satnica Fishpond, and the plan for a city hotel in Valpovo was abandoned.

19 The Sava Hotel in Jasenovac (second half of the 1970s) and the Park Hotel in Našice (1980) were built in a somewhat modified form compared to the SHS project concept. Architect Branka Bek joined M. Salaj and Z. Krznarić as the co-author of the project for the hotel in Lipik. Detailed design for the hotel in Vinkovci was made by architects Nebojša Ćalić and Marija Bošnjak.

20 The memorial house was officially opened in January 1972, almost a decade after its construction began (1961).

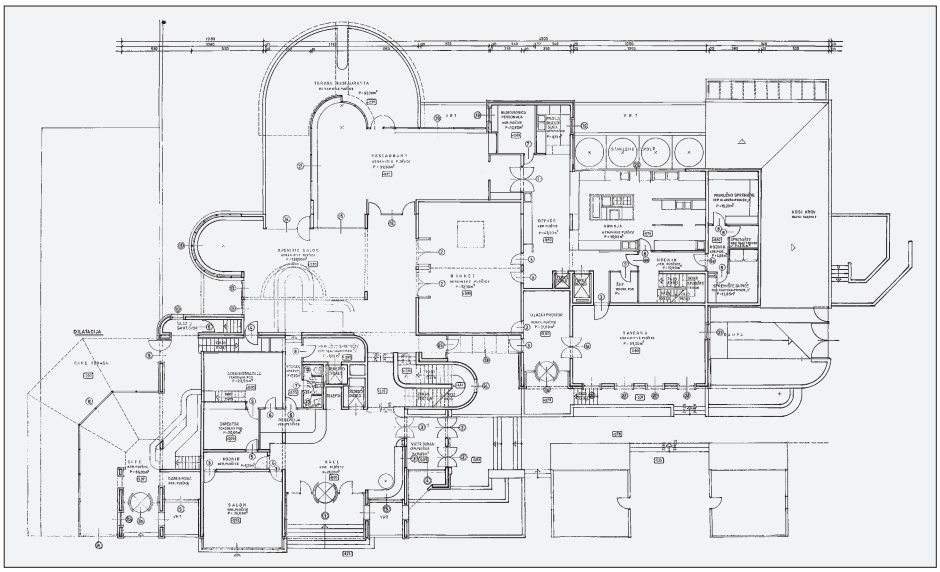


FIG. 8 SHS: DUNAV HOTEL IN VUKOVAR, 1976 CONCEPTUAL DESIGN, MAIN PROJECT AND 1979-1980 COMPLETED PROJECT. PHOTOGRAPH TAKEN AFTER CONSTRUCTION (UP); GROUND FLOOR PLAN (RIGHT).

introduced to refine the space and achieve a better ambience.

The principle of standardization represented by the project was also applied in the organization of public amenities, by introducing typical blocks for certain functional groups – a hotel hall with a reception and an aperitif bar, a restaurant, a block of space for rent (banquet hall) and service areas (tavern, coffee bar, snack bar). Accommodation tracts were designed in a construction grid that corresponded to the basic module of the accommodation unit of 2.90 m in width, while depth depended on the model/facility type, which is why three variants existed (for a city/tourist hotel – 4.5 m and 5.4 m; for a spa hotel – 5.4 m and 6.9 m; for a motel – 4.5 m). The functional organization of the accommodation unit – the room was adapted to the facility's basic purpose, that is, to its guest profile and structure. Rooms were designed in two variants – single with a French bed and double

FIG. 9 SHS: LIPIK HOTEL IN LIPIK, 1977 CONCEPTUAL DESIGN, MAIN PROJECT AND 1978-1982 COMPLETED PROJECT, HOTEL APPEARANCE (RIGHT)

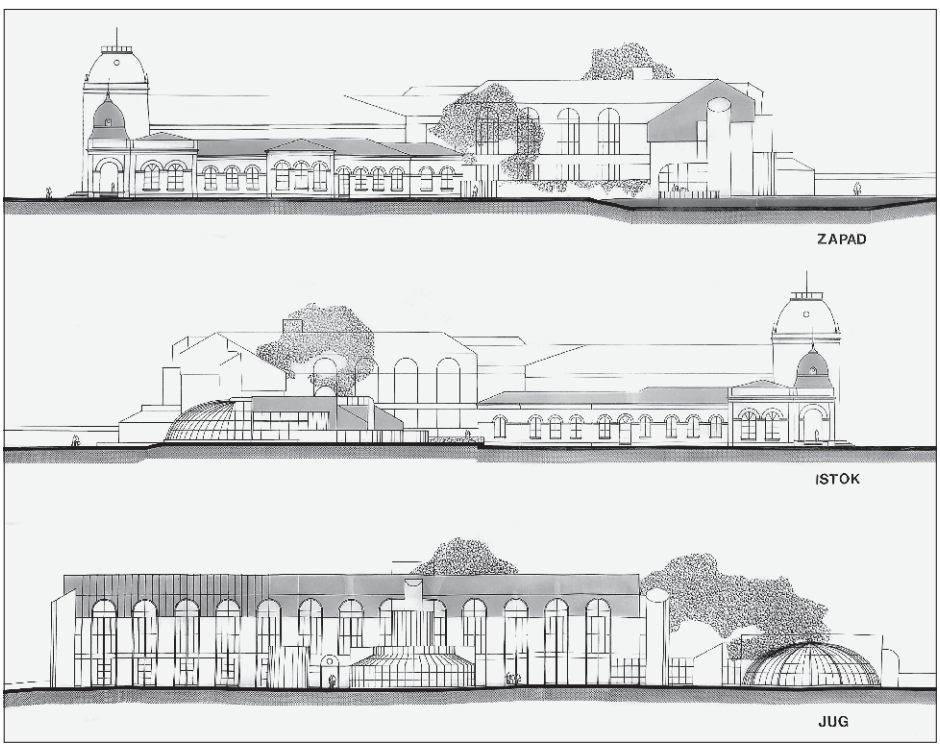
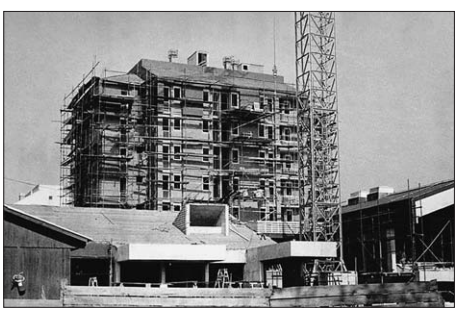


FIG. 10 SHS: SLAVONIA HOTEL IN VINKOVCI, 1976 CONCEPTUAL DESIGN, MAIN PROJECT AND 1979-1980 COMPLETED PROJECT; PHOTOGRAPH TAKEN DURING CONSTRUCTION (DOWN)



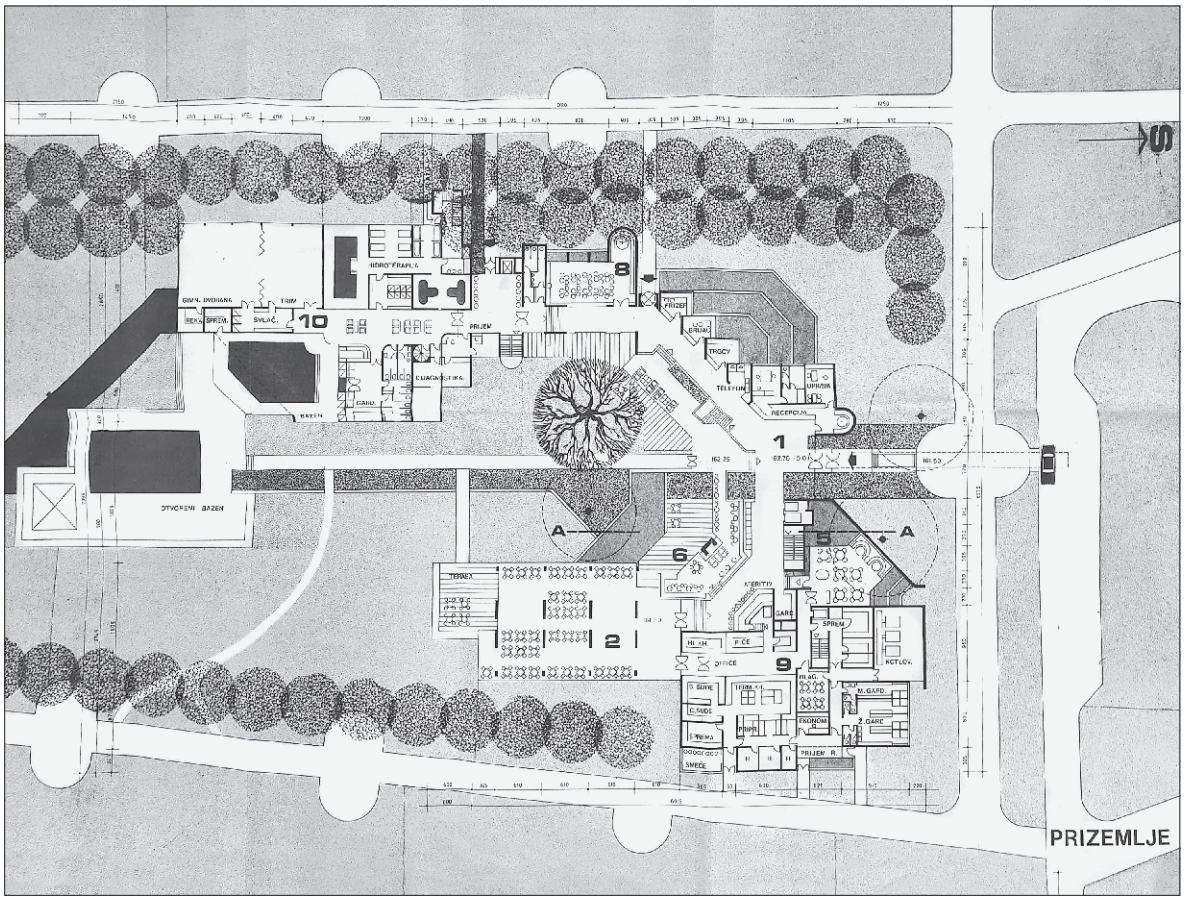


Fig. 11 SHS: Termal Hotel in Daruvar, 1975 conceptual design, main project and 1976-1979 completed project, ground floor plan

(Fig. 7). A module of 30, 60 and 90 cm was used to furnish the rooms. For all room models, a typical bathroom was provided in the form of an installation block, which was built in a workshop and installed as semi-prefabricated. To present the project, prior to the start of construction of the first SHS facility, models of all room types together with furnishing were built in a 1:1 scale. In addition to custom-designed furniture for accommodation units, the project also envisaged standards for other interior equipment and inventory, to serve as visual identification and a basic design characteristic of the SHS.

Hotels that were built, in the city and spa type, show the conceptual characteristics of the SHS architecture. The Dunav Hotel in Vukovar, whose investor was the city's agro-industrial conglomerate, was built at the confluence of the Vuka and the Danube in the northwestern part of the city's main square, following the 1972 urban development plan for the centre zone by Matija Salaj. The hotel's position, dimensions and composition, with an indented annex with a horizontal layout (wide foot) and a seven-floor accommodation volume, show that the hotel was conceived as an architectural benchmark of the

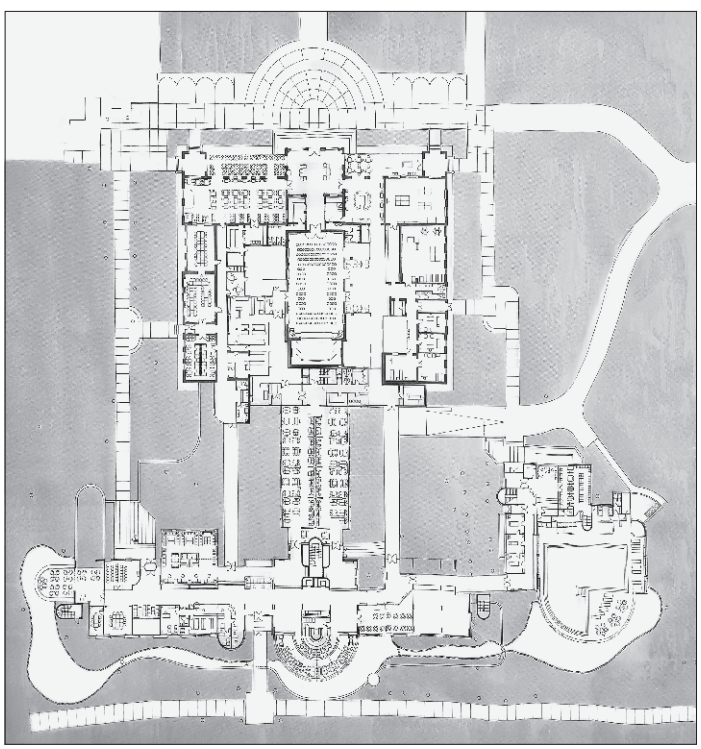


Fig. 12 SHS: Lipik Hotel in Lipik, 1977 conceptual design, main project and 1978-1982 completed project, ground floor plan

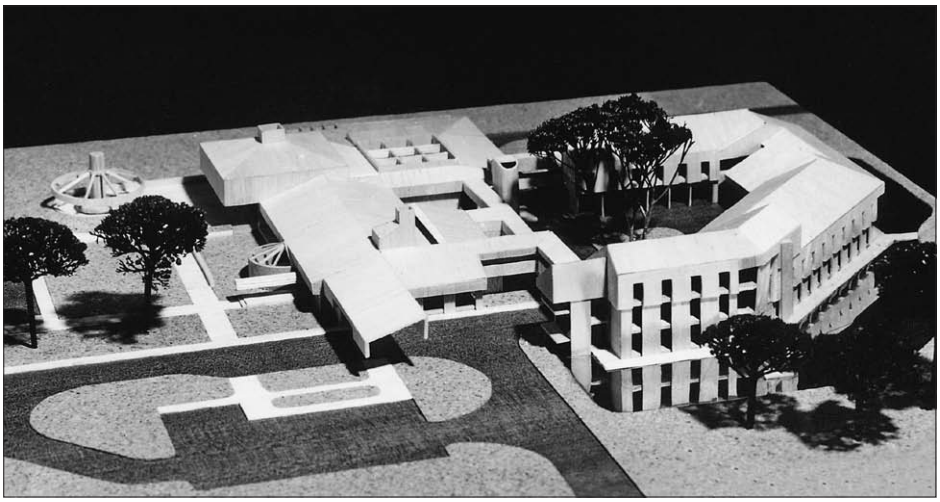
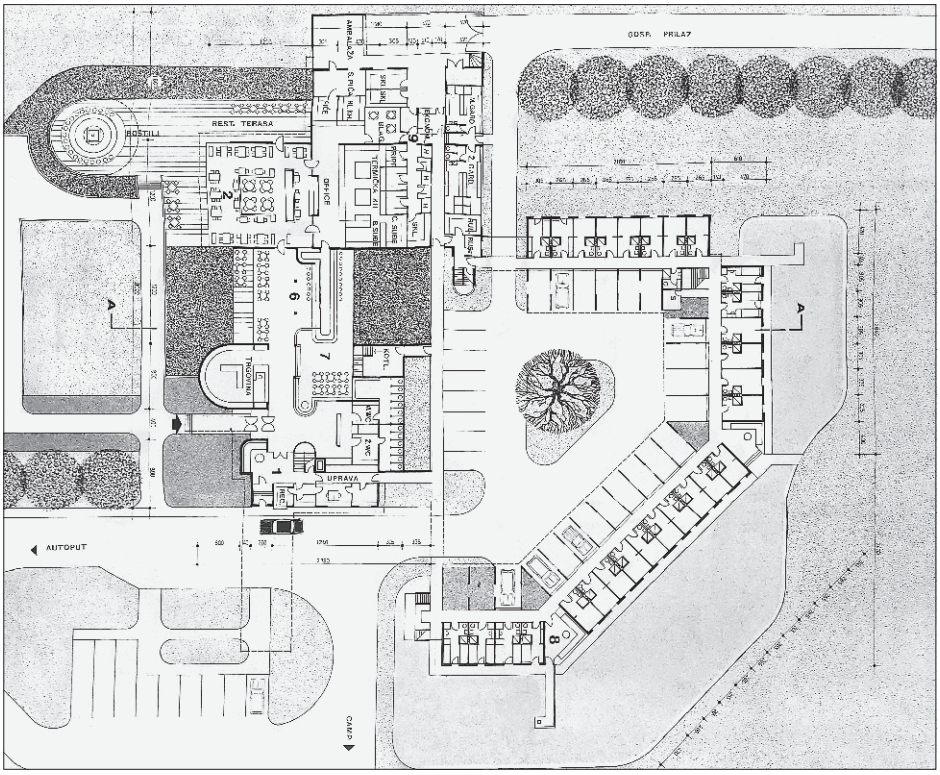


FIG. 13 SHS: MOTEL FOR THE SREDANCI SITE ON THE ZAGREB-BELGRADE MOTORWAY, 1976 (PHOTOGRAPH OF A MOCK-UP)

FIG. 14 SHS: MOTEL FOR THE SREDANCI SITE ON THE ZAGREB-BELGRADE MOTORWAY, 1976, GROUND FLOOR PLAN



square, while social and public functions were treated as an extension or addition to the urban public space – the entrance hall and cafeteria face the city square and the promenade along the Vuka, while the aperitif bar and restaurant with a terrace open towards the Danube on the other side (Fig. 8). In addition to many design aspects characteristic of the described SHS concept, such as pitched roofs, brick use, paraphrases of certain traditional elements such as bay windows and interior decoration, the architectural design of the Vukovar city hotel also bears a local feature, which is the design interpretation of the nearby water tower (Fig. 8). The hotel in Vinkovci was also designed with similar architectural features and an organizational scheme (*Exhibition of project documentation for a department store, hotel, underpass*, 1976; Fig. 10). A different approach was used for the spa hotel in Daruvar, whose meandering layout resulted from adaptation to the natural environment (Fig. 11). The hotel was located along the northern edge of a lawn, lined with an avenue of hornbeam trees and valuable oak specimens. Tall black walnut trees were kept and became the main compositional motif around which the south-facing hotel amenities were grouped. Unlike this spa hotel, whose layout and dimensions were influenced by location characteristics, the benchmark for the design and position of the hotel in Lipik was the existing Kursalon (spa salon) building, which had been built in the well-known spa complex at the end of the 19th century in the spirit of historicist architecture of Neo-Renaissance to a design by Budapest architect Gustav Rath to house a restaurant, a coffee house, a ceremonial hall and several salons (Puhmajer, 2010: 45-61). The new hotel design, in fact, included an extension and adaptation of the Kursalon building (Fig. 9). Semi-open spaces between the three parallel arms connected by the main tract (inverted letter E shape at the base) were closed and integrated into a single space for the hotel's public amenities (lobby, restaurant, bar, multifunctional hall, halls for various gatherings; Fig. 12).

The architectural concept of the motel, which was not built in any of the planned locations along the Zagreb-Belgrade motorway, resulted from the intention to find a functional motel type whose design would fit logically into the plains landscape and suit the architectural tradition of the region (Fig. 13). The authors wanted the motel design to be reminiscent of a Slavonian farm. In the design process, this idea meant that main amenities – service and accommodation – would be separated into two zones with inserted green areas in the form of atriums, courtyards, and planters. The first zone, closer to the road, consisted of the ground floor, emphasized by differently shaped roofs, and contained service facilities, while accommodation units were placed in the meandering tract in the background to protect the passengers in the rooms from noise (Fig. 14). This tract was positioned in the way that enabled rooms to have views of the landscape, and the area in front of it to have a vehicular access and a car park.[21]

21 For more details on the architecture of motels in Yugoslavia from 1955 to 1990, see: Antešević, 2022: 268-273, 373-391, 503-510.

Hotels of the tourist and recreational type in Donji Miholjac and Našice were built slightly more modestly, but they did have the main SHS design features (Fig. 16), especially the interior of the hotel in Donji Miholjac, built on the outskirts of the town next to the Drava reservoir (visible roof structure, amber brick, wood). In addition to the conceptual design of the hotel in Beli Manastir, made in 1975 as part of the SHS project, Matija Salaj and Branka Bek created in 1987 a new conceptual design of the city hotel to be built by the Agro-industrial Conglomerate Belje on a plot across the main square, which remains unbuilt to the present day (Beli Manastir Hotel, 1987; EMS). Compared to the first design, conceived as a tourist and recreational hotel, which implied wide-ranging dimensions divided into public amenities and an accommodation tract, the new preliminary design, although not belonging to the original SHS project, was conceived after bigger city hotels designed for Vukovar and Vinkovci, as visible in a series of design solutions, especially the roof and openings (Fig. 15).

Fig. 15 Hotel in Beli Manastir (second conceptual design), 1987, hotel appearance

Conclusion: The Importance of the Slavonia Hotel System for Continental Tourism Development in Croatia

The Slavonia Hotel System project, conceived as a chain of hospitality and tourist facilities of specific organizational form types, was meant to provide better opportunities in the hotel business and tourist offer of Slavonia and Baranja (exploitation, profitability) through standardized services, harmonized architectural processing and internal space organization and to be the driving force behind faster tourism development. The SHS accommodation and hospitality facilities, with a total capacity of about 2,000 beds, were designed for the B category. However, one of the most significant contributions to rationalize the SHS construction was to reduce the net area per bed compared to the average square footage for that category, at the expense of commercial and service facilities (Salaj, 1982c: 22). Although the SHS model did not come to life and did not produce desired results, especially in terms of organizational form and joint marketing, it showed the tourism industry's aspirations to modernize its operations and, in particular, emphasized Salaj's role in putting forward new concepts and architectural solutions. Salaj was of opinion that the traditional functional scheme of the hotel must be transformed into a more modern form as the hotel industry continued to develop, with an increase in receptive spaces and simplicity in expression, and primarily in terms of treating the modern tourist – user (Salaj, 1982a: 94). Based on previous design experiences, programme capacities and economic aspects of the SHS project were more elaborate due to the rationalisation factor, while the architectural concept, based on regional construction characteristics, included more standardised elements and spatial solutions.

Orientation towards the user was also one of the basic characteristics of postmodern architecture. Because of its pronounced tendency to accept new aspirations in architectural practice, as well as its reliance on tourism development trends, it could be said that hotel architecture announced post-modern tendencies during the 1970s. Those at its forefront insisted on communicativeness of architecture as the basic principle of behaviour, so post-modernist tendencies also emphasized the process of "participation" in design (Čaldarović, 1980: 57). The affirmation of the generation of architects to which Salaj and Krznarić belonged was primarily influenced by new creative ideas and attitudes arising from the conditions of practice and what it provided. Architects of that generation, who learned from the modernists, were committed to overcome modernist limitations and determined to face social reality (Dženks, 2016: 36). One of the basic characteristics of postmodern architecture was manifested in the liberation of architectural design from its ideological and universalistic concept (Delalle, 1980: 45). This encouraged the affirmation of regional characteristics, which is why many hotel and tourist facilities designed at the Urban Institute, including the SHS project, aspired to find ways for achieving a dialogue with "the genius loci", as well as to establish higher standards of construction practice (Salaj, 1987: 87). Compared to Salaj's designs of hotels at the Adriatic coast,

Fig. 16 SHS: Park Hotel in Našice, 1977 conceptual design, 1980 completed project (photograph taken after construction)

when he worked at the Suradnik Bureau and the Urban Institute (independently and as a co-author), the proposed models of accommodation facilities within the SHS project are individually less innovative in terms of design, but in terms of the programme they represent a fully harmonized system that underwent certain changes in some of its parts.

Believing that designers and planners must use tourism resources in the best possible way for the construction of tourist facilities to take on appropriate forms instead of the desire for quick profit and quick revival of underdeveloped regions (Salaj, 1989: 69), Salaj always acted first and foremost as an urban planner, aware of social interest, but completely unburdened by socialist demagoguery, as also confirmed by his need to persevere in preserving space, to change what is bad, and to draw lessons from tradition, without being trapped by it (Rošin, 2023: 311-312). Salaj and Krznarić received an award for the programme and conceptual design of the Slavonia Hotel System project at the 11th Zagreb Salon: architecture and urban planning in 1976 (*** 1976a: 20), and later, at the 17th Salon held in 1982, they presented their hotels built in Vukovar and Daruvar (*** 1982: 69). With the breakup of Yugoslavia in 1990, which also marked the end of the socialist system in which hotels operated as organizations of associated labour within hotel and hospitality companies, the fate of the SHS built hotels was twofold – while some were devastated during the war and continued to deteriorate after the war due to unresolved property-legal relations (Vukovar, Jasenovac) or were demolished having suffered significant damage (Lipik), others were privatized and continued to operate as hotels (Daruvar, Našice, Donji Miholjac), but because of the renovation and modernization, they underwent mostly inadequate interventions and adaptations that were not based on valid design interpretations of the original architecture.[22] The Termal Hotel remains the best preserved and maintained one, owing to the attractiveness of the Daruvar Spa, as well as to the position held by services in the healthcare system.

[Translated by Zdenka Ivkovčić]

22 On the concept of the cycle of using tourist facilities and the technical-technological aspects of the renovation of hotel facilities due to accelerated obsolescence in tourism, see: Butler, 1980: 5-12; Mrinjek Kliska el al., 2019: 310-321; Antešević, 2023: 132-145.

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AY – Archives of Yugoslavia, Belgrade: Fund 130 – Federal Executive Council of Yugoslavia (1953-1992).

CSA – Croatian State Archives, Zagreb: Fund 2039 – Urban Institute of Croatia, box 907 – Slavonia Hotel System; 1073 – Hotel in Vukovar; 914 – Hotel in Slavonski Brod.

CMA – Croatian Museum of Architecture, Zagreb: Architect Matija Salaj.

EMS – Estate of Matija Salaj (the Salaj family), Zagreb: list of works and projects, written works, documentation and projects of SHS facilities, tourist architecture projects in Croatia.

Illustration sources

Figs. 1, 2, 4, 5, 7, 9, 10, 12, 13	EMS
Fig. 3	Salaj, 1987: 81
Fig. 6	CMA: Matija Salaj (hotel in Daruvar)
Figs. 8	CMA: Matija Salaj (hotel in Vukovar)
Figs. 11, 14	CSA: Fund 2039, box 907 – Slavonia Hotel System

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Conceptualization: N.A.; methodology: N.A.; validation: J.K.; formal analysis: N.A.; investigation: N.A.; resources: N.A. and J.K.; data curation: N.A.; writing – original draft preparation: N.A.; writing – review and editing: J.K.; visualization: N.A.; supervision: J.K.; funding acquisition: J.K. Both authors have read and agreed to the published version of the manuscript.

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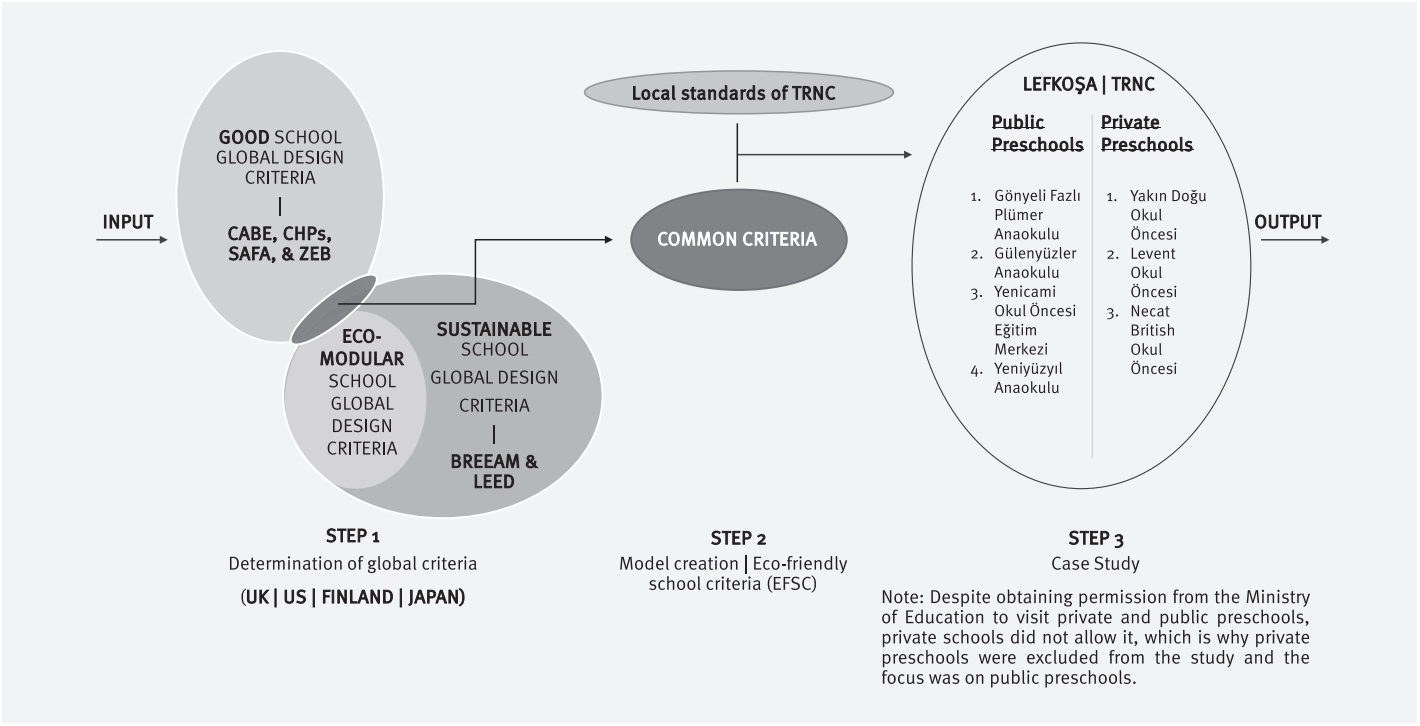

Fig. 1 Diagram showing the methods used in this study

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Evaluating Pre-School Design in Lefkoşa, Northern Cyprus, Based on Global Sustainability Criteria

EDUCATIONAL SPACES
GLOBAL CRITERIA
PRE-SCHOOL DESIGN
SCHOOL-DESIGN STANDARDS
SUSTAINABLE DESIGN

Considering the design of schools is of utmost importance, especially in the early stages of education. When evaluating pre-schools in Lefkoşa, North Cyprus, we see that the emphasis is on providing classical design standards rather than modern standards. The common standards of global school design standards were collected and harmonized to form the criteria for the study under the title of "Eco-Friendly School Criteria" (EFSC) and then harmonized in the form of a questionnaire that was followed in the re-evaluation process of four public schools in Lefkoşa, North Cyprus. The aim of this study is to show the importance of increasing the scope of knowledge in North Cyprus about the concept of pre-school design, and to re-evaluate it to consider the extent to which the current design of schools conforms to the EFSC standards while taking into account local standards. The results showed that the average compliance rate of these schools with the EFSC standards is 68/110, which indicates a lack in providing a sustainable and comfortable learning environment for the user, including people with disabilities, to make them feel a sense of belonging to the place.

INTRODUCTION

Schools are regarded as the primary institutions aimed at developing generations intellectually, culturally, and literarily. Consequently, attention to school design is crucial in creating a comfortable educational setting that engages students, enhances focus, and fosters a love for learning (Valjan Vukić, 2012: 123-32; Gysbers, 2001: 96). A well-designed school environment is seen as a vital component in improving the quality of learning and teaching, as nurturing educational spaces contributes significantly to the development of students and instils enthusiasm for learning (Ural, 2023; Çanli, 2019). Adhering to legislation, including laws, administrative rulings, and recommendations, is essential for determining thermal comfort in pre-schools (Lovec et al., 2020: 346-359). The field of architecture aims to create both indoor and outdoor environments tailored to user needs while achieving maximum aesthetic and functional efficiency. Physical spaces impact the psychological well-being of users, their connection to the environment, and their overall comfort. Therefore, designers must create spaces that meet functional requirements and accommodate diverse situations (Zaunstöck and Grunewald, 2022). To achieve effective design, it is crucial to understand the relationship between people and their environments, taking into consideration the elements that foster user harmony with the design. The quality of a place is directly linked to its functionality and reception, particularly in pre-school settings, which are seen as foundational for nurturing a new generation filled with vitality, activity, and clarity of mind, along with their interaction with spaces (Baker, 2012: 6-9). School design must incorporate sustainability elements and create environments that help users adapt to their surroundings while being aware of the spaces around them. Methodologies for sustainability, assessment, development, and application in construction are considered essential measures for promoting a more sustainable environment (Sanei, 2022: 106-125). This study aims to highlight the significance of designing schools and educational spaces in enhancing learning and teaching processes, as schools play a pivotal role in cultivating thought and culture among generations (Wihardjo et al., 2017: 251-257; Gelfand, 2010). The scope of this research focuses on pre-school design, intending to compile global criteria and principles for the design of pre-schools to establish common standards that will facilitate the re-evaluation of pre-school design in Lefkoşa, North Cyprus, in accordance with international benchmarks. This study seeks to emphasize the importance of expanding knowledge about school design concepts, especially pre-schools, as practiced in Cyprus, to create a healthy and sustainable educational environment that harmonizes education with nature while ensuring user comfort in both educational and recreational areas. Additionally, it aims to enhance accessibility to all parts of the school for all students, particularly those with disabilities – whether motor, visual, or hearing impairments. Thus, this research is designed to serve as a turning point in re-evaluating the concepts and standards of school design in Cyprus as implemented by relevant authorities and to stress the need for rethinking cur-

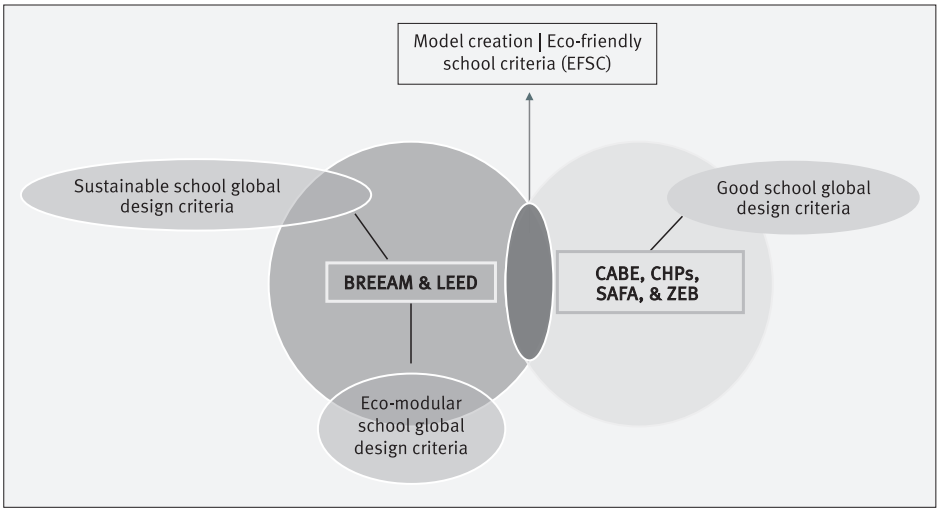


FIG. 2 EXTRACTING EFSC-SPECIFIC CRITERIA FROM COMMON CRITERIA AMONG GLOBAL CRITERIA

rent standards in existing schools. It will also demonstrate the importance of raising awareness about sustainable environmental design in educational facilities and the influence of local standards on the evaluation process alongside international norms.

Methodology

The reason for choosing the pre-school stage is that it is considered the most important stage in teaching and learning, as it contains the primitive foundation of the child's mind to prepare him mentally, psychologically, and intellectually for science. The degree of interest in designing educational spaces at this stage is very necessary, as the degree of interest leads to the child's mind and thoughts being negatively or positively affected during his educational stages, depending on the educational environment in which he grew up (Stipanec and Bartolac, 2015: 81-92; Ozer, 2017). The design of public and private pre-schools in the city of Lefkoşa in Northern Cyprus will be re-evaluated according to global criteria, as the pre-school stage is considered a cornerstone in building the child's personality and his connection to science and the learning environment (Smajlović et al., 2023: 299-311). Therefore, it is necessary to create a comfortable and purposeful scientific environment that attracts the child's attention to everything going on around him in terms of spaces, technologies and designs that help him link his interest in the internal environment to the external environment and provide lighting and good ventilation. The study followed certain methods to achieve the desired goal, as follows:

1. Collecting the global criteria designated for the design of educational spaces and schools.

2. Collecting local standards of Northern Cyprus (TRNC) designated for designing educational spaces and schools.

3. Re-evaluation of schools at the pre-school level in Lefkoşa, Northern Cyprus, to determine the extent to which the criteria used are consistent with global criteria (Fig. 1).

New terminology has been selected to bring together global standards in a way that makes it easier for the reader to follow the points and their connection to each other. As shown in Figure 2, the standards are expressed in different terms from one guide to another, so work has been done to develop and summarize the terms used in the common global standards and put them in a list called EFSC standards. Figure 3 illustrates the process of extracting the five EFSC criteria from the Good, Sustainable, and Eco-friendly criteria and how the Average rating is calculated. Figure 4 shows the process of extracting the average EFSC rating from the LEED and BREEAM ratings, each of them has a total rate of 100 but with some additional

From good, sustainable, and eco-modular to EFSC criteria

Good school design criteria:
- Safety features | Safety measures
- Common areas | Functional spaces | Classroom layout
- Comfort level | Indoor comfort
- Basic materials
- Fixed designs | Standard layout
- Basic design | Functional design
- Accessibility features | Open access
- Educational technology | Traditional tech tools
- Basic infrastructure | Educational facilities

Sustainable school design criteria:
- Safety and security | Safety protocols
- Learning environment | Multi-functional spaces
- Indoor climate | Comfort conditions | Thermal comfort
- Renewable resources | Sustainable materials
- Flexible spaces | Adaptive learning spaces
- Eco-friendly design | Green design
- Universal design | Inclusive access
- Sustainable technologies | Green technology
- Sustainable infrastructure | Eco-infrastructure

Eco-modular school design criteria:
- Safety standards | Secure design
- Modular units | Flexible learning areas | Adaptable spaces
- Comfort design | Wellness features
- Renewable energy systems | Eco-friendly materials
- Modular flexibility | Reconfigurable spaces
- Modular design | Adaptive design
- Accessible design | Barrier-free access
- Smart technology | Advanced tech solutions
- Modular infrastructure | Flexible infrastructure

The criteria have been reorganized under EFSC-specific terminology, as follows:
- ✓ Design quality (for safety and security): emphasizes the importance of creating secure and functional environments.
- ✓ Health and well-being focuses on fostering a conducive atmosphere for learning through comfort and climate control.
- ✓ Sustainability: underlines the growing responsibility of educational institutions to operate in an environmentally friendly manner.
- ✓ Flexibility and adaptability: highlight the need for learning spaces that can evolve to meet changing educational demands.
- ✓ Equity and accessibility: stress the importance of inclusivity, ensuring that all students can participate fully in educational experiences.

Fig. 3 Extracting EFSC criteria from global good, sustainable, and eco-modular school criteria

Fig. 4 EFSC average rating

EFSC criteria average rating extracted from LEED and BREEAM common criteria credits weight

LEED credits weight	BREEAM credits weight	Average	EFSC average rating out of 110
Integrative process (IP) 1 point	Management (Man) 11 credits	6	**Design quality for safety and security: 26%** ✓ 6/6 (IP+Man) ✓ 6/12 (Security of site design and Risk assessment). ✓ 4/4 (Pol) ✓ 8/8 (IN+Inn) ✓ 2/2 (RP)
Location and transportation (LT) Up to 16 points	Transport (Tra) 10 credits	13	
Sustainable site (SS) Up to 10 points	Land use & ecology (LE) 13 credits	12	
Water efficiency (WE) Up to 11 points	Water (Wat) 7 credits	9	**Health and well-being: 17%** ✓ 2/12 (Access to nature). ✓ 15/15 (EQ+Hea)
Energy and atmosphere (EA) Up to 33 points	Energy (Ene) 16 credits	25	
Materials and resources (MR) Up to 13 points	Materials (Mat) 15 credits	14	**Sustainability: 48%** ✓ 2/12 (Site selection & Sustainabile landscape). ✓ 9/9 (WE+Wat) ✓ 25/25 (EA+Ene) ✓ 10/14 (Sustainable materials) ✓ 2/2 (Wst)
Indoor environment quality (EQ) Up to 16 points	Health & wellbeing (Hea) 14 credits	15	
Waste (Wst) 0 points	Waste (Wst) 6 credits	2	
Pollution (Pol) 0 points	Pollution (Pol) 8 credits	4	**Flexibility and adaptability: 6%** ✓ 2/12 (Design and furniture flexibility). ✓ 4/14 (Using materials that can adapt to different construction requirements, accommodating future modifications).
TOTAL 100	**TOTAL 100**	**100**	
Innovation (IN) Up to 6 points	Innovation (Inn) 10 credits	8	**Equity and accessibility: 13%** ✓ 13/13 (LT+Tra)
Regional priority (RP) Up to 4 points	Regional priority (RP) 0 credits (regional specific)	2	
TOTAL 110	**TOTAL 110**	**110**	

NOTE: The proportions were determined according to LEED and BREEAM standards and how the full and partial proportions were distributed, according to the reference guides and documents found on their official websites.

Initial design considerations (1980s-1990s)	Recognition of educational importance (2000s)	Emphasis on child-centered design (2010s)	Sustainable design principles	Regulatory framework and accreditation
In the earlier years, pre-school facilities in Lefkoşa were primarily designed with basic functional requirements in mind. The focus was largely on the provision of space for activities rather than specific design criteria that catered to early childhood needs. Safety and basic infrastructure were prioritized, but the environments tended to be conventional and not particularly tailored to young learners.	By the early 2000s, there was a gradual shift in attitudes towards pre-school education. This period marked an increase in both the number and quality of pre-school buildings, driven by a growing recognition of the importance of early childhood education. Design criteria began to evolve to foster creativity, social interaction, and active learning, emphasizing the need for spaces that provided opportunities for play and exploration.	In the 2010s, there was a heightened effort to develop child-centered design criteria for pre-school buildings. Architects and educators began collaborating to create spaces that supported various developmental needs, incorporating elements such as: Open and Flexible Spaces: Allowing for different types of activities and interactions. Natural Lighting: Maximizing daylight to create a more welcoming and stimulating environment. Outdoor Access: Encouraging outdoor play and learning through accessible outdoor spaces or gardens. Safety and Accessibility: Ensuring that facilities were safe and accessible for all children, including those with disabilities.	In recent years, the concept of sustainability has gained traction, influencing pre-school design criteria. New buildings are increasingly incorporating eco-friendly materials, energy-efficient systems, and designs that promote environmental stewardship among children. This shift aligns with broader global trends toward sustainability in architecture.	The establishment of a regulatory framework and accreditation standards for pre-schools also played a crucial role in shaping design criteria. Government guidelines began to incorporate both local cultural and environmental factors alongside internationally recognized standards, ensuring that pre-school designs met the specific needs of the community.

5

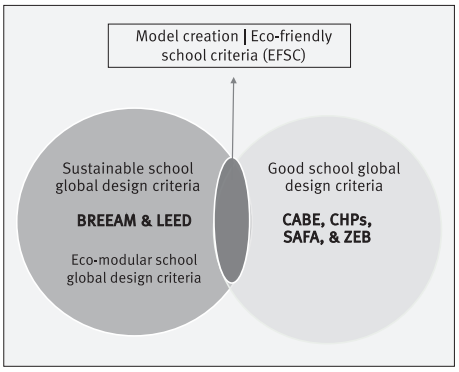
School 1	It was opened in 2014.
	It is a new building that has never been used for any other purpose before.
	Teaching concept: Natural and play based active learning.
	Children age 4-5 years | Groups up to 15 students for each group.
School 2	Built before 1974.
	Used for construction teacher academy, then primary school, and now it is a pre-school.
	Teaching concept: Natural and paly based active learning.
	Children age 4-5 years | Groups up to 15 students for each group.
School 3	This pre-school is from the British period before 1960.
	There is no information about its previous uses.
	Teaching concept: Play-based learning.
	Children age 4-5 years | Groups up to 15 students for each group.
School 4	It was used as pre-school after 1974.
	It was a Greek school before 1974.
	Teaching concept: Montessori methods with nature-based active learning.
	Children age 4-5 years | Groups up to 15 students for each group.

6

FIG. 5 TIMELINE OF DEVELOPMENTS IN PRE-SCHOOL EDUCATION IN LEFKOŞA, TRNC: HISTORICAL OVERVIEW

FIG. 6 INFORMATION ABOUT RE-EVALUATING PRE-SCHOOLS IN LEFKOŞA, TRNC

FIG. 7 CHART PRESENTING THE MAIN THREE TYPES OF SCHOOL DESIGN CRITERIA



standards, it is out of 110, such as innovation and regional priority standards.

Sustainable design standards generally seek to reduce resource consumption, minimize waste generation, and promote environmentally friendly practices throughout the building life cycle (Boeri and Longo, 2013: 140-157). This study was conducted to consider the percentage of compliance of pre-school design standards in Lefkoşa with international standards and re-evaluate them. Still, local standards cannot be ignored, as they play an important role in the re-evaluation due to their importance in taking into account the regional climate and local physical, cultural, and social factors (Smajlović and Novalić, 2020: 249-260).

DATA ANALYSIS

The data obtained from the questionnaire were evaluated according to the EFSC criteria, and the questions were placed in 5 sections (design quality for safety and security, health and well-being, sustainability, flexibility and adaptability, equality and accessibility). The data obtained from the questionnaire were evaluated according to the EFSC criteria, and the questions were placed in 5 sections (design quality, health and well-being, sustainability, flexibility and adaptability, equality and accessibility). Each section was evaluated separately by calculating the number of criteria available in the school compared to the number of required criteria. For example, in the design quality criterion there are 19 points, and let us assume that a school provides 9 points out of 19. Since the design quality as a whole has a percentage of 26/110, in this case the calculation is as follows: (Total percentage) / (Number of points) = Percentage of each point of the design quality points separately:

$26/19 = 1.36$

Then the school's compliance percentage with the EFSC criteria is calculated in the following way: Percentage of one point × number of matching points = Conformity percentage:

$1.36 \times 9 = 12.24$ (The percentage of the hypothetical school's compliance with the EFSC criteria out of 26.)

After calculating the percentages of compliance of all criteria for the hypothetical school, the total percentage is calculated by adding the results of the conformity of the five criteria for the same school with the EFSC criteria. Finally, after calculating the compliance percentages of the schools concerned, the average compliance percentage of the pre-schools in Lefkoşa with the EFSC standards should be calculated by dividing all the total percentages of the schools by the number of schools, and the average percentage will appear.

MODEL CREATION

Early education, especially pre-school, is a vital period in children's development. It con-

tributes to the development of social, intellectual and emotional skills necessary for integration into society. In recent years, pre-school education in Lefkoşa, Northern Cyprus, has witnessed significant developments that have improved the quality of education, provided and expanded the scope of services. In this context, we shall review the history and development of pre-schools in this region, focusing on the main aspects that have influenced early education. Figure 5 provides a brief overview. Figure 6 shows some important information about the pre-schools evaluated, including their history, whether the pre-school building was adapted for other purposes or not, the teaching concept that explains spatial specificities, the number of students and the size of groups. Figure 7 shows three types of school design criteria that have been worked on: good sustainable, sustainable, and portable designs, then combining common global criteria, that were called Eco-Friendly School Standards (EFSC).

Findings

The results and outcomes of the re-evaluation of the public pre-schools in Lefkoşa, which were conducted within the framework of the EFSC criteria, were evaluated as follows:

The percentages were divided into, design criteria 26/110, health and well-being 17/110, sustainability 48/110, flexibility and adaptability 6/110, equality and accessibility 13/110, and 110 as total. The largest percentages were focused on criteria that affect architectural design in terms of accessibility and sustainability. Table I shows the evaluation of design quality in public pre-schools in Lefkoşa according to EFSC criteria. This section includes 19 evaluation points. The criteria available in each school are indicated and then the number of matching points is calculated to extract the percentage.

By obtaining the evaluation results of the schools, the average percentage of conformity of the design quality criteria of these schools with the EFSC criteria was reached, and the result is 14.7 approximately 15/26. Table II shows evaluation of health and well being in public pre-schools in Lefkoşa according to EFSC criteria. This section includes 16 evaluation points.

By obtaining the evaluation results of the schools, the average percentage of conformity of health and well-being criteria of schools with the EFSC criteria was reached, and the result is 13.27 approximately 13/17. Table III shows evaluation of sustainability in public pre-schools in Lefkoşa according to

Table I Evaluation of design quality in public pre-schools in Lefkoşa according to EFSC criteria

Design quality (for safety and security) 26/110

Criteria	School 1		School 2		School 3		School 4		Average ratio Out of (26)
		Out of (26)		Out of (26)		Out of (26)		Out of (26)	
1. Keyed locks	✓	15.05	✓	16.42	✓	10.94	✓	16.42	15
2. Biometric systems	x		x		x		x		
3. Fences	✓		✓		✓		✓		
4. Badge system	x		x		x		x		
5. Emergency shelters	x		x		x		x		
6. Fixed cameras	✓		✓		✓		✓		
7. Motion detection	x		x		x		x		
8. Audio recording	x		x		x		✓		
9. Adequate alarms	✓		✓		x		✓		
10. Adequate visual alerts	✓		✓		x		✓		
11. Adequate auditory alerts	x		x		x		x		
12. Adequate evacuation plans	✓		✓		✓		✓		
13. Adequate fire suppression systems	✓		✓		x		✓		
14. Fire exits	✓		✓		✓		✓		
15. Lightning rods (regulation on fire protection of buildings)	x		✓		x		x		
16. Fire resistant material	x		x		x		x		
17. Is the building resistant to earthquakes?	✓		✓		✓		✓		
18. Has an earthquake test been done?	✓		✓		✓		✓		
19. Infrastructure for future technological updates	✓		✓		✓		✓		

Table II Evaluation of health and well being in public pre-schools in Lefkoşa according to EFSC criteria

Health and well being 17/110

Criteria	School 1		School 2		School 3		School 4		Average ratio Out of (17)
		Out of (17)		Out of (17)		Out of (17)		Out of (17)	
1. Daylight	✓	13.81	✓	14.87	✓	10.62	✓	13.81	13
2. Ventilation	✓		✓		✓		✓		
3. Acoustic	✓		✓		✓		✓		
4. Orientation	✓		✓		✓		✓		
5. Recreational areas	✓		✓		✓		✓		
6. Playing areas	x		✓		✓		✓		
7. Green spaces	✓		✓		x		✓		
8. Outdoor learning opportunities	x		✓		✓		✓		
9. Indoor spaces designed for music and creative activities	✓		✓		x		✓		
10. Indoor hall for multi-purpose use	✓		✓		x		x		
11. Adequate classrooms	✓		✓		✓		✓		
12. Adequate offices	✓		✓		x		x		
13. Art l science classrooms	✓		✓		✓		✓		
14. Indoor sport spaces	✓		x		x		x		
15. Thermal Comfort: Thermal comfort shared between health and well-being and sustainability	x		x		✓		✓		
16. Flooring (consideration for comfort and safety)	✓		✓		x		✓		

TABLE III EVALUATION OF SUSTAINABILITY IN PUBLIC PRE-SCHOOLS IN LEFKOŞA ACCORDING TO EFSC CRITERIA

Sustainability 48/110									
Criteria	School 1		School 2		School 3		School 4		Average ratio Out of (48)
		Out of (48)		Out of (48)		Out of (48)		Out of (48)	
1. Green roofs	✓	34.28	✓	27.42	✓	27.42	✓	34.28	31
2. Green walls	✓		✓		✓		✓		
3. Sustainable landscaping	Nature inspired playground	✓		✓		✓		✓	
4. Materials (materials supporting sustainability and health)	✓		✓		✓		✓		
5. Site selection	✓		x		x		x		
6. Energy efficiency	x		x		x		x		
7. Water efficiency (rainwater harvesting)	x		x		x		✓		

TABLE IV EVALUATION OF FLEXIBILITY AND ADAPTABILITY IN PUBLIC PRE-SCHOOLS IN LEFKOŞA ACCORDING TO EFSC CRITERIA

Flexibility and adaptability 6/110									
Criteria	School 1		School 2		School 3		School 4		Average ratio Out of (6)
		Out of (6)		Out of (6)		Out of (6)		Out of (6)	
1. Ability to add mobile classrooms as needed.	x	2.4	✓	3.6	x	2.4	✓	4.8	3
2. Designing spaces that can be reconfigured as educational needs evolve.	x		✓		x		x		
3. Installation of demountable partitions and movable walls to create flexible classroom layouts to allow spaces to be divided or expanded to accommodate various class sizes and activities.	x		x		x		✓		
4. Creating multi-use spaces within the classroom design, such as areas that can be used for group discussions, individual work, or collaborative projects. This versatility accommodates a variety of learning activities.	✓		✓		✓		✓		
5. Adaptable and movable furniture and equipment that can be easily rearranged to support different teaching methods and learning activities.	✓		x		✓		✓		

TABLE V EVALUATION OF EQUITY AND ACCESSIBILITY IN PUBLIC PRE-SCHOOLS IN LEFKOŞA ACCORDING TO EFSC CRITERIA

Equity and accessibility 13/110									
Criteria	School 1		School 2		School 3		School 4		Average Ratio Out of (13)
		Out of (13)		Out of (13)		Out of (13)		Out of (13)	
1. Ramps	✓	4.87	✓	8.12	x	1.62	✓	9.75	6.09
2. Elevators & Staircases (Since all schools consist of ground floor only, the average ratio will be calculated by excluding elevators and staircases.)	x		x		x		x		
3. Accessible to all Spaces/ Services	✓		✓		x		✓		
4. Safety Railings	✓		✓		✓		✓		
5. Accessible Information (Visual Materials)	x		✓		x		✓		
6. Accessible Information (Auditory Materials)	x		✓		x		✓		
7. Transportation: Provide bike racks.	x		x		x		x		
8. Transportation: pedestrian pathways.	x		✓ x		x		✓		
9. Access to public transportation.	x		x		x		x		

EFSC criteria. This section includes 7 evaluation points.

By obtaining the evaluation results of the four schools, the average percentage of conformity of sustainable criteria of schools with the EFSC criteria was reached, and the result is 30.85 approximately 31/48.

Table IV shows evaluation of flexibility and adaptability in public pre-schools in Lefkoşa according to EFSC criteria. This section includes 5 evaluation points.

By obtaining the evaluation results of the schools, the average percentage of conformity of flexibility and adaptability criteria of school design with the EFSC criteria was reached, and the result is 3.3 approximately 3/6. Table V shows evaluation of equity and accessibility in public pre-schools ın Lefkoşa according to EFSC criteria. This section includes 9 evaluation points. Since all schools consist of ground floor only, the average ratio will be calculated by excluding elevators and staircases, this section will be evaluated using 8 evaluation points only.

Accordingly, schools 1, 2, 3 and 4 obtained the following percentages: 4.87, 8.12, 1.62 and 9.75 out of 110. The average ratio is 6.06 approximately 6/110.

Figure 8 shows the evaluation of each pre-school section, each school will be evaluated individually. Average final percentage for each school individually = Sum of school section percentages. After obtaining the percentage of each section of the criteria separately, the final percentage of the conformity of the public pre-schools design in Lefkoşa with the EFSC criteria will be found by collecting the results of the sections to reach to the final percentage of each school (Fig. 9). The final average percentage of Lefkoşa pre-schools in total = Sum of percentages of schools / Number of schools:

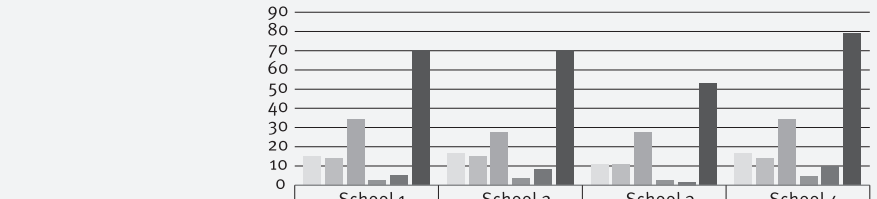
(70+70+53+79) / 4 = 272/4 = 68/110

Discussion

Although schools meet classical standards and some modern ones, awareness must be spread about developing educational spaces to include modern standards and advanced systems, to increase support for education and safety, to integrate modern technology with educational methods, and to create learning environments integrated with nature. Figure 10 shows the average ratio of Lefkoşa public pre-schools' design criteria conforming to EFSC criteria.

Environmental awareness regarding sustainable buildings should be cultivated to create educational spaces and lifestyles that are highly compatible with nature, thereby contributing to environmental protection. Pre-schools play a crucial role in this foundational stage for children, as they begin to observe and engage with their educational and recreational environments, as well as their perceptions of the surrounding spaces. Therefore, it is essential to enhance children's relationship with the physical environment, encouraging interactions that foster communication skills through activities centered on sustainable environmental education.

8



	School 1	School 2	School 3	School 4
Design criteria 26/110	15,05	16,42	10,94	16,42
Health and well being 17/110	13,81	14,87	10,62	13,81
Sustainability 48/110	34,28	27,42	27,42	34,28
Flexibility and adaptability 6/110	2,4	3,6	2,4	4,8
Equity and accessibility 13/110	4,87	8,12	1,62	9,75
Total 110	70	70	53	79

9

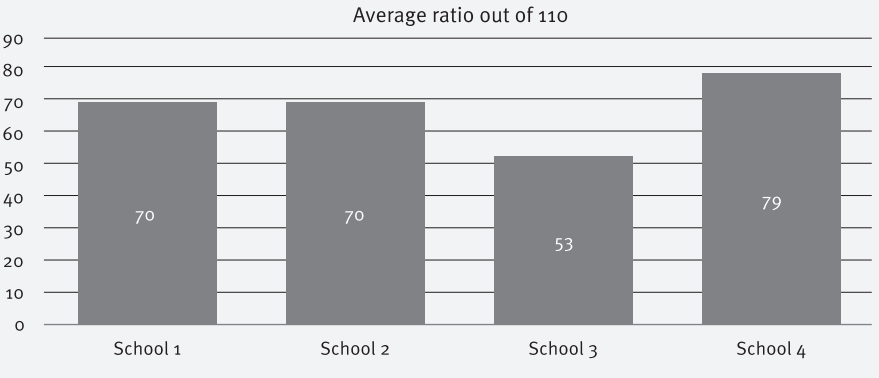


Fig. 8 Evaluation chart of the main criteria

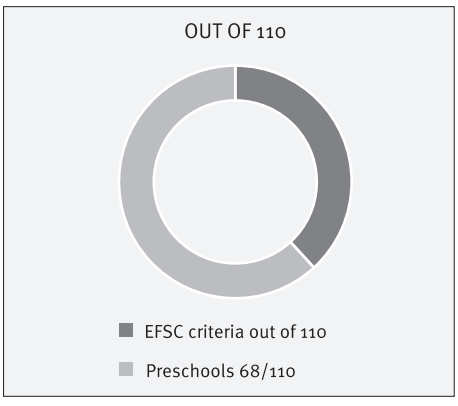
Fig. 9 Final result of the pre-schools' evaluation

Conclusion

This study was conducted with the aim of re-evaluating pre-schools design, in Lefkoşa, Northern Cyprus, to determine their compliance with global sustainability standards and to consider the level of awareness about this. During this study, after collecting global standards and extracting commonalities between them to create the EFSC standards, it was found that the average percentage of compliance of the design standards of public pre-schools in Lefkoşa with the EFSC standards is 68/110, which indicates a lack of awareness towards many standards, including:

– Safety and security standards using modern technologies and devices.

Fig. 10 Average ratio of Lefkoşa public pre-schools' design criteria conforming to EFSC criteria



– Health and well-being standards, as the deficiency here varies from one school to another, and in general lies behind the lack of outdoor spaces dedicated to education and the lack of interest in providing thermal comfort in some schools such as schools 1 and 2, as well as the lack of indoor spaces dedicated to sports and others dedicated to art and multi-use as in schools 2, 3 and 4.

– Sustainability standards, schools lack interest in energy and water efficiency as well as site selection.

– Flexibility and adaptability standards, here only standards that provide a limited degree of flexibility and adaptation to various teaching methods were provided.

– Equality and accessibility standards: There is a lack of attention to providing visual, audio and kinetic information that helps in reaching all parts of the school, whether internal, external or service, including providing safe access to public transportation and safe pedestrian paths.

Based on the results, it is clear that there is a lack of awareness of the importance of designing environmentally friendly schools. The pre-school stage is a crucial stage in shaping the child's personality and his relationship with the environment and his surroundings, enabling him to focus, explore and receive information easily. It is necessary to improve schools to keep pace with technological developments while creating sustainable educational environments. This includes developing educational spaces and raising awareness of the spaces and buildings in which children live and use them, as well as linking learning to nature and training children to deal with and protect it. Moreover, it is necessary to take into account local standards alongside international standards, as local standards reflect social, cultural and climatic contexts, ensuring that the needs of society are met more effectively. To raise the level of schools in the field of sustainable design, awareness of the necessary sustainable standards in these institutions must be enhanced. Children's psychology and their integration with nature and the surrounding environment must also be taken into account. It is also important to develop accreditation standards for schools in Lefkoşa, North Cyprus, in line with EFSC standards while incorporating local specificities to ensure best educational practices in line with the cultural values and unique needs of the community. In this way, pre-schools can contribute to creating effective and sustainable learning environments that enhance children's well-being and create a deeper connection to the world around them.

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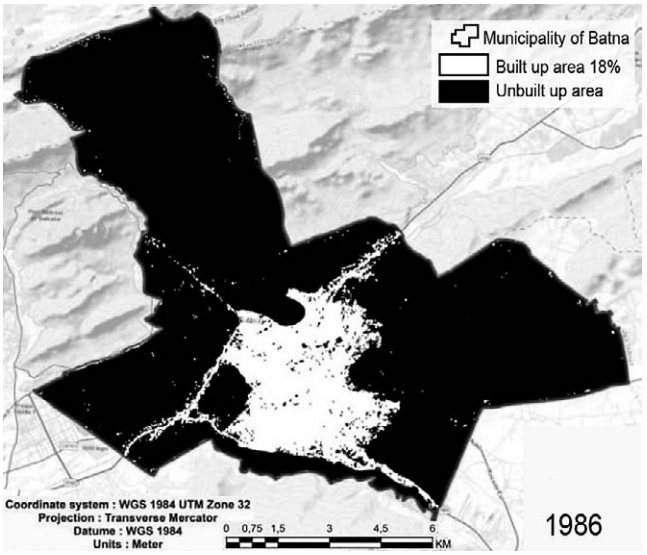
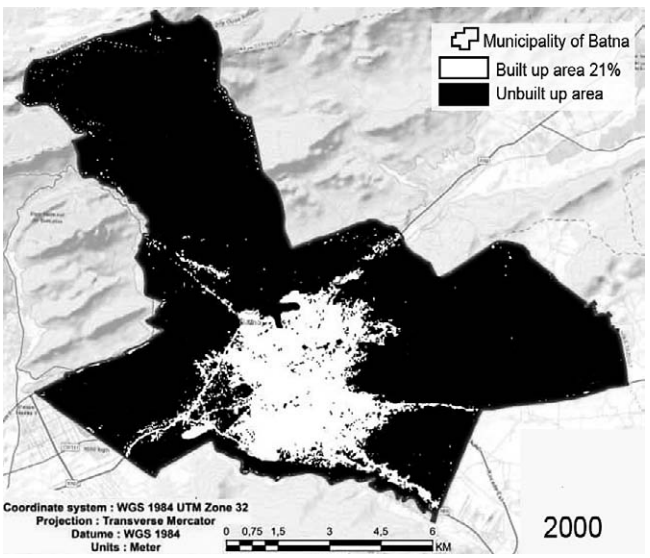
Conceptualisation: R.T. and Ç.Ö.; methodology: R.T. and Ç.Ö.; software: R.T.; validation: R.T. and Ç.Ö.; formal analysis: R.T.; investigation: R.T.; resources: R.T.; data curation: R.T. and Ç.Ö.; writing – original draft preparation: R.T.; writing – review and editing: R.T. and Ç.Ö.; visualization: R.T.; supervision: Ç.Ö.; project administration: Ç.Ö.; funding acquisition: R.T. Both authors have read and agreed to the published version of the manuscript.





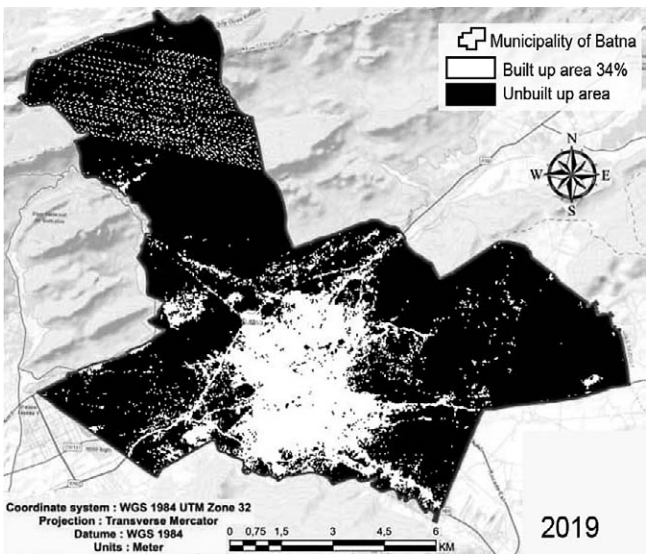
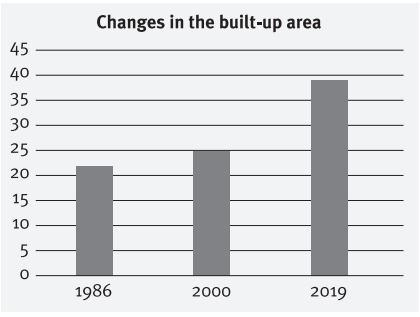


Fig. 1 Urban density and built-up area evolution



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Urban Densification: Effective Sustainability Solution against Urban Sprawl

Batna, Algeria
remote sensing
sustainable development
urban densification
urban sprawl

City densification is typically presented as a strategy to address the challenges of urban sprawl and rapid soil degradation. The aim of this article is to analyze the morphology of the city of Batna, Algeria, using remote sensing and GIS. This approach is part of the prevailing concern over urban sprawl, which is viewed as a troubling phenomenon that increasingly threatens territorial balance. The rate at which natural and agricultural land is being consumed by urban development is accelerating, leading to a gradual and worrying reduction in natural and agricultural land. In the current context, it has become imperative to implement effective strategies to reduce the excessive consumption of bare land. Urban densification appears to be one of the most promising solutions for countering the phenomena of suburbanization and the degradation of natural soils. This perspective seeks to reduce the irrational use of natural and agricultural spaces while ensuring the conservation of resources for future generations, aligning with the principles of sustainable development. The results of this research show that urban densification, which corresponds to optimizing the use of space in urban areas, has the effect of reducing the mineralization of bare soil. This reduction is the result of the city building on itself rather than extensively. The research highlights the decisive impact of urban densification as an effective tool in the fight against urban sprawl. However, this approach to sustainable development is not sufficient on its own; it must be integrated into an overall policy framework for sustainable development, combining different mechanisms for action.

Introduction

Urbanization is a socio-economic phenomenon that continues to grow worldwide. This growth is mainly due to the increase in the number of city dwellers, influenced by migratory movements, both voluntary and involuntary, and the search for better living conditions (Magidi, Ahmed, 2019: 1). However, it has been observed that this rapid urban growth has sometimes led to uncontrolled expansion of urban space. This has led to forms of urban development that are unsustainable in environmental and economic terms (Shao et al., 2020: 241). Unsustainable urban development has reached such a level of concern that it has become a major threat to the achievement of the Sustainable Development Goals (SDGs) through the universal phenomenon of urban sprawl. Considered one of the major human dynamics of our time, this process is the subject of much debate in the fields of urban planning, regional sciences, ecology, economics, and geography. It is a dynamic that represents a major challenge in terms of sustainability, leading to profound transformations in urban lifestyles. Addressing it requires a multidisciplinary approach that involves multiple analytical perspectives and confronts major sustainability issues (Imbrenda et al., 2022: 23). Like many countries around the world, Algeria is faced with the phenomenon of urban sprawl, which emerged as a trend after the Second World War. Since independence, Algerian towns have undergone massive urbanization across the country, leading to the emergence of sprawling, fragmented cities. The phenomenon is constantly evolving and affects all urban areas, including the city of Batna, which will be the subject of our case study.

In recent decades, Batna has experienced more pronounced and significant spatial expansion (Dridi et al., 2015: 212), with urban areas constantly expanding, increasingly impacting urban life, and posing a threat to the natural environment. In order to consider effective and sustainable urban planning for the future, it is essential to start with a comprehensive understanding of the phenomenon of urban sprawl.

Today, urban sprawl is an important and topical issue, as urban agglomerations are growing, expanding and spreading worldwide (Sharma et al., 2024: 1-2; Lounis et al., 2024: 405). This excess of land use and occupation resulting from urban sprawl represents a major challenge for the sustainable development and resilience of cities (Nuissl, Siedentop, 2021: 91-92).

The aim of this article is to analyze this phenomenon using morphological indicators based on remote sensing and GIS over the period 1986-2019, in order to quantify and map the spatiotemporal evolution of the urban sprawl and its impact on the natural environment, while examining the role of urban densification as a relevant strategic approach in the fight against urban sprawl. Remote sensing is a method that makes it possible to closely monitor spatiotemporal changes in urban and natural areas using satellite imagery, which offers the possibility of regularly updating the state of land occupation and use in the studied areas (Dechaicha, Alkama, 2020: 44; Chetara, 2023: 122-123).

This remote sensing approach remains a crucial method for monitoring changes in urbanization and ensuring effective planning for the future of cities as part of sustainable urban development.

- **The process of urban sprawl** – Today's cities, driven by economic and technological progress, are expanding and developing remarkably. This urban growth often results in urban sprawl, a growing phenomenon of urbanization marked by the outward expansion of cities into peripheral and rural areas, moving away from the city center (Antoni, Youssoufi, 2007: 3; Muchelo et al., 2024: 1), often to the detriment of agricultural or natural lands. This development model is now a classic and universal concept in geography, urban planning, and environmental studies (Simard, 2014: 332) and represents a complex

process manifested by the city's expansion into the surrounding rural areas. It cannot be simply defined as a static phenomenon, as it involves a set of constantly evolving dynamics. It is primarily characterized by horizontal expansion and significant fragmentation, marked by an extensive road network, fragmented plots, and low-density construction due to new residential, commercial, and industrial infrastructures built outside the traditional city limits, resulting in very loose urban fabrics (Le Néchet, 2015).

Urban sprawl is characterized by the expansion of urbanized areas, the dispersal of homes and jobs over greater distances, and an increasing reliance on cars for commuting. It can lead to land fragmentation, the loss of agricultural land and natural spaces, air and water pollution, traffic congestion, alteration of microclimate, destruction of aesthetics, increasing crime wave, pollution and waste management problems (Aniekwe, Igu, 2019: 15) and other environmental and socio-economic issues. According to Aguejdad (2009): "Urban sprawl presents a significant challenge to sustainable development. It accelerates the consumption of land designated for farming in peri-urban areas, leads to socio-spatial segregation, incurs economic costs, and notably contributes to environmental problems."

• **Forms of urban sprawl** – Urban sprawl can take several forms depending on various artificial or natural constraints:

– Concentric sprawl, often described as an oil spot pattern, occurs when urban expansion develops around a central core, typically featuring the urban center, leading to the emergence of secondary centers in the peripheral areas.

– Linear urban sprawl is referred to as a 'glove finger' sprawl when urbanization follows transport axes, and fragmentation results in more dispersed urban forms.

– Dispersed urban sprawl is an extension that does not conform to any of the aforementioned types, often due to the terrain's relief or a lack of communication networks.

– Parallel urban sprawl occurs when a new city is created adjacent to an existing older city, meaning two urban entities are situated parallel to each other.

• **Causes of urban sprawl** – This phenomenon is often the result of factors such as population growth, increased demand for housing, the availability of inexpensive land on the outskirts of cities, and preferences for a suburban lifestyle (Table I).

• **The consequences of urban sprawl** – Urban sprawl can have significant repercussions on land use and land cover, infrastructure, mobility, the environment, and the quality of life for residents. Urban planning and land management often aim to regulate and limit urban sprawl to promote the sustainable development of cities through strategies of urban densification (Table II).

Urban Densification as a Sustainable Urban Planning Strategy (Concept and Principles of Urban Densification)

• **The impact of urban densification on urban sprawl** – Before addressing urban densification, which has been a key objective of urban policies since the 1970s, it is important to define the concept of urban density, which has recently sparked intense debate among experts, becoming a current topic with major implications for sustainable urban development, environmental preservation, climate challenges, and issues related to urban sprawl.

Goal 11 of the Sustainable Development Goals (SDGs), adopted by the United Nations in 2015, aims to promote more sustainable urbanization. This ambition aims to address the ample criticism directed at urban sprawl.

Internally, urban sprawl weakens city centers and distances people from their homes and workplaces, leading to longer commute times, increased social and territorial inequalities, and higher costs for local authorities, particularly in terms of infrastructure and services. It also contributes to the saturation of car traffic.

Outside urban areas, sprawl has major environmental consequences: it consumes a lot of energy, increases greenhouse gas emissions, weakens biodiversity, and leads to excessive consumption of land and natural resources. This evolution of ideas and concepts has had a profound influence on urban development approaches. Today, the focus is on controlling urban sprawl and seeking more sustainable urban forms. In this perspective, density has become a central indicator of the sustainable city. It is closely linked to the model of the compact city, often presented as a relevant solution to the excesses of the dispersed city (Breuillé et al., 2019: 346).

According to Touati (2015), the term "density" has a multidisciplinary meaning. It is often used vaguely in the fields of urban planning, urban economics, and geography. Urban density represents a theoretical ratio between a given quantity (such as the number of inhabitants, jobs, housing units, or even floor area in square meters) and the space it occupies (in terms of gross or net land area).

Table I Factors of urban sprawl

Factors of urban sprawl
– Population growth affects both urban and rural areas. When a city experiences an increase in its population, residents tend to migrate to peripheral areas in search of more space and affordable housing.
– The development of the automobile plays a significant role in promoting urban sprawl, enabling residents to live at a distance from their workplaces and amenities.
– Rural exodus is observed in many regions of the world, particularly in the poorest areas or those undergoing industrial growth, whereby rural inhabitants migrate to cities in search of better employment opportunities.
– In wealthy countries, there is an urban exodus towards the outskirts, driven by the high cost of property in city centers, increased accessibility for cars, and the rise of remote work.
– Land policies and property development often promote the construction of new housing on cheaper land, primarily on the outskirts of cities, thereby contributing to urban sprawl.

Table II Repercussions of urban sprawl

The repercussions of urban sprawl	
Environmental stakes	– A reduction in biodiversity and the destruction of ecosystems due to the conversion of agricultural land into urban areas. – Air pollution related to vehicles. – Artificialization and mineralization of soils. – The destruction of rural landscapes.
Social stakes	– A decline in the quality of life for residents, linked to the reduction of activities and services available in the city center.
Economic stakes	– An increasing consumption of energy and resources, along with a rise in greenhouse gas emissions. – An increase in transportation costs for residents living far from their workplace or commercial centers. – Increased costs for water, electricity, road maintenance and waste collection due to population dispersion. – Downtown businesses disappear as commercial activities move to more accessible outlying areas. – Increase in the number of vacant housing units in downtown areas, while residents prefer to move to the suburbs.

Urban density is not a monolithic concept but rather a composite notion that varies depending on the field of application. Here are some categories of density: building density or built density, a concept generally used by architects and urban planners; population density, a term frequently used in geography; traffic density; equipment density; activity density. The calculation of these densities refers to the chosen density domain, each type having its own mathematical formula.

However, in the present research, we refer to the field of urban planning, which practically pertains to built density, providing information on the proportions occupied by constructions and their relationship with undeveloped areas.

In this context, the principle of densification consists of preserving the natural environment while limiting ecological impact, which today constitutes one of the major concerns of sustainable urban planning (Robert, 2016). It is the result of a public policy aimed at combating urban sprawl and the problem of increasing built-up areas within the boundaries of existing cities. The fundamental objective is no longer to extend urbanized areas onto new land, but to densify already built-up areas by using available plots or renovating some of them (Maréchal, 2015), which is what is now called urban recycling.

Urban densification is therefore a process of increasing the concentration of population, buildings, and economic activities in existing urban areas. This process involves several perspectives:

• **Urban perspective** – Kaur et al. (2020), stress that the concept of urban densification has come to the fore as an alternative to the phenomenon of urban sprawl, because the latter implies rational and intensive consumption of land through vertical densification reflected in the construction of taller buildings, a reduction in the distance between buildings, workplaces, services and public spaces, and also optimizing the use of existing urban infrastructure. The overriding objective is to limit the consumption of space while offering a high-quality living environment.

• **Environmental perspective** – The environmental dimension consists of directing urban densification towards ecological ends. It is establishing itself as a virtuous model associated with sustainable development (AUCAM, 2015: 1) by limiting the ecological impact through preserving natural areas, this way of controlling the urban area ecologically involves decreasing dependence on the car by encouraging public transport, cycling and walking, which considerably reduces greenhouse gas emissions. It also aims to reduce the harmful consequences of urban heat islands (UHIs) by improving the growth of green and permeable areas, and by reintegrating urban ecology into the urban environment.

• **Social perspective** – Urban densification has a crucial social dimension, impacting residents' quality of life, access to services, social diversity, and community cohesion. Well-planned densification can stimulate neighborhood vitality by offering a range of accessible amenities and services while promoting sustainable lifestyles.

With regard to the social dimension, Lermoyer (2023: 13) indicates that urban densification ensures both the concept of social and functional mix, the first of which refers to the cohabitation of various social groups in a single area with a set of functions necessary for urban life, namely: various residential, economic, political, administrative, mobility and leisure facilities and services.

• **The contribution of remote sensing in detecting changes in urban sprawl** – To achieve the objectives defined by sustainable urban development (SUD), it is now essential to mobilize different disciplines and areas of expertise. These include remote sensing and geographic information systems (GIS), which play a fundamental role in the planning and management of sustainable and resilient cities (Biłozor et al., 2024: 16).

The advent of remote sensing and GIS techniques has made it possible to collect information without physical contact and to extract relevant information in digital form using remote measurements. This has enabled researchers, planners, resource managers, and policymakers to gain a historical perspective of the land and detect changes in urban land use (Magidi, Ahmed, 2019: 2).

Other contributions of remote sensing and GIS in international and local research include studies on large forest fires, cloud tracking for weather forecasting, and monitoring urban sprawl using temporal data (Sonde et al., 2020; Shao et al., 2020; Bennasr, 2003; Dechaicha, Alkama, 2021; Slimani, Raham, 2023; Bentekhici, Yousfi, 2013). These papers have focused on the role of remote sensing and geographic information systems (GIS) in the analysis, detection, and monitoring of urban expansion, with particular emphasis on how the results contribute to recommendations for future sustainable planning.

In this paper, remote sensing is used as an investigative method to characterize and analyze spatio-temporal changes in urban sprawl in the city of Batna.

Materials and Methods

• **Study area** – The study was carried out in Batna, a city in the northeastern Algeria area defined by coordinates between 35° and 36° North latitude and 4° and 7° East longitude. About 425 km southeast of Algiers, the capital of Algeria. It is nestled within a valley that stretches between two distinct mountain ranges: the Tellian Atlas and the Saharan Atlas. This geographical location endows the city with a fundamental topographic uniqueness that significantly influences its climatic characteristics and living conditions.

Batna is situated on a specific geographic site characterized by a relatively flat basin-like topography in the center, which gradually slopes as one moves away from this central point, particularly towards the south. This topographic feature has considerably facilitated its spatial expansion, a phenomenon highlighted in the study. The area of the wilaya of Batna spans 12,038.76 km², ranking it fifth in the hierarchy of Algerian urban centers (Fig. 2).

The wilaya of Batna is bordered by several wilayas. To the north, it is bordered by the wilaya of Mila, while to the East; it is adjacent to the wilaya of Khenchela. In the West, it shares a boundary with the wilaya of M'sila. To the south, it is bordered by the wilaya of Biskra. In the Northwest, it is contiguous with the wilaya of Setif, and to the northeast, it shares limits with the wilaya of Oum El Bouaghi.

It is worth noting that the city of Batna, located in the northeastern part of the wilaya of Batna, holds a historically recognized position as the capital of the Aures region. This city, which simultaneously serves as the administrative center of both the wilaya and the municipality of Batna, covers a total area of 11641 hectares. Additionally, its average altitude is 1058 meters above sea level (Fig. 3).

• **Population density** – At the end of 2019 the population of the wilaya of Batna is estimated at 1,377,000 inhabitants, whereby the municipality of Batna with 350,000 inhabitants is by far the most populous. The average population density of the province at the end of 2019 is 114 inhabitants per km².

• **Data collection** – In the context of this study, two methodologies were combined, each providing specific insights into the understanding of the phenomenon under investigation (Fig. 4). The first methodological approach consists of a remote sensing study. This approach aims to characterize the spatiotemporal changes of the urban area of Batna over a period of 30 years, from 1986 to 2019. Secondly, a morphological approach was employed, using two morphological indicators to quantify urban sprawl in the city of Batna for the three selected periods.

To achieve the desired results, this process was carried out in stages:

– To achieve the target results, this process was completed in stages;

– Collection of satellite data and images for the periods 1986, 2000 and 2019;

– Classification of satellite images through supervised classification;

– The acquisition of data required by a Geographic Information System (GIS) for the calculation of the two morphological parameters, namely density and compactness.

• **Data and Image Preprocessing** – The data used in this study consist of a series of time-series images acquired by the Landsat 5 TM and Landsat 8 OLI/TIRS sensors. These images are freely available on the NASA and United States Geological Survey (USGS) websites. The images have a spatial resolution of 30 m for the visible and near-infrared (NIR) bands, 120 m for the thermal bands of Landsat 5 TM, and 100 m for the thermal bands of Landsat 8 OLI/TIRS. The images cover key dates between 1986 and 2019, selected approximately every 15 years to ensure temporal consistency. These scenes were chosen based on the similarity of atmospheric and phenological conditions to minimize seasonal variations (Table III).

The remote sensing data were analyzed using a Geographical Information System (GIS), specifically ArcGIS software. This phase of image processing is crucial as it facilitates the development of Land Use and Land Cover (LULC) maps. In the context of this study, the main objective of this study is to map and

Fig. 2 Geographical location of the settlement of Batna on the map of Algeria

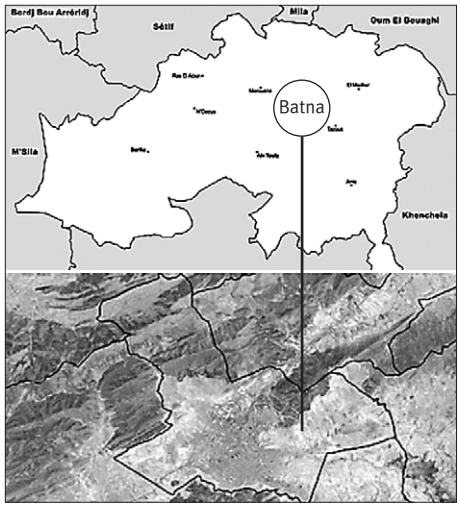


Fig. 3 Administrative boundaries of the wilaya of Batna

Fig. 4 Structure of the study

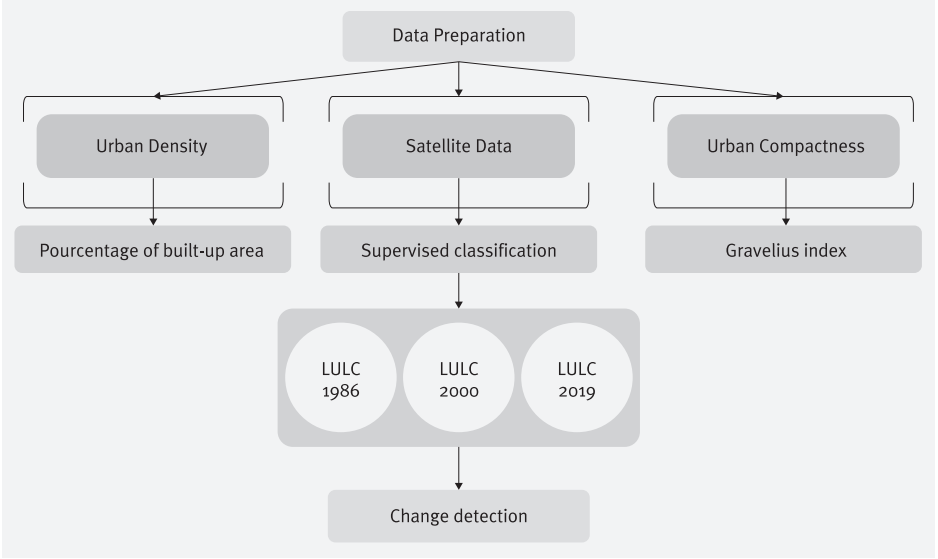


TABLE III ACQUISITION DATES AND CHARACTERISTICS OF IMAGE DATA USED

Satellite	Acquisition dates	Time	Number of bands	Resolution	Cloud- cover	Azmuth	Sun elevation	WRS/Path
Landsat 5 TM	15/07/1986	09 :30 :05	7	30 m	0.00	108.96	58.77	193
	12/07/2000	09 :50 :28	7	30 m	0.00	112.36	61.70	194
Landsat 8 OLI/TIRS	17/07/2019	10 :13 :27	11	30 m	0.00	121.05	65.44	194

monitor the evolution of the urban area of Batna (Fig. 5).

For this purpose, we used Level 1 Terrain Precision (L1TP) imagery, which are geometrically corrected and georeferenced to the WGS84 datum and projected in the Universal Transverse Mercator (UTM) coordinate system by the USGS (Soto et al., 2024: 98).

The delimitation of the study area was based on the current administrative boundaries, extracted from a shapefile obtained via DIVA-GIS, a free software for mapping and geospatial analysis.

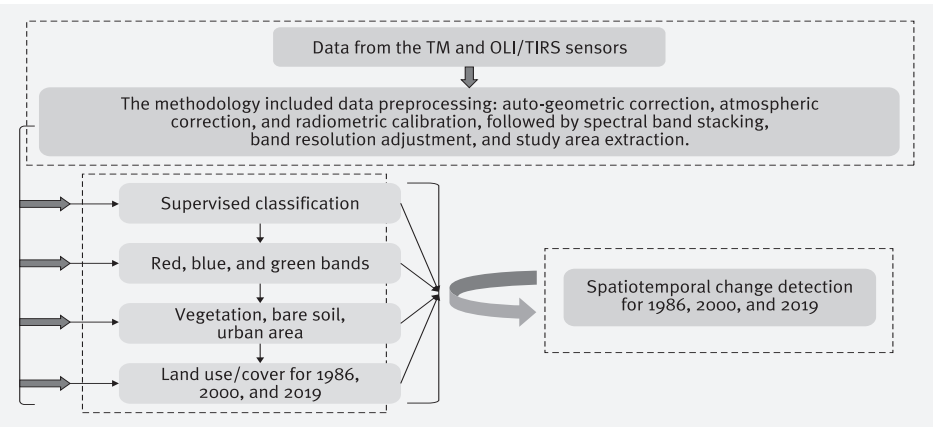
Finally, the Landsat images, provided in digital numbers (DN) corresponding to radiance, were radiometrically calibrated. This involves the application of a TOA (Top of Atmosphere) correction (Slimani, Raham, 2023: 21) as well as the use of the DOS1 (Dark Object Subtraction) model, which reduces the effect of dark noise in the image.

• **Supervised Classification** – The supervised classification method allows for the creation of land cover maps. This approach relies on the identification of information classes for various types of surfaces, which are then used to define the spectral classes representing them through the maximum likelihood algorithm (MLA) (Soto et al., 2024: 98), which calculates the probability of a pixel belonging to each class in order to determine the digital "signature" of each class. Furthermore, the analysis of urban evolution at the scale of the city of Batna was strengthened through a morphological approach, using morphological indices, particularly urban density (represented by the ratio between built and non-built areas) and urban compactness, measured using the Gravelius index. These calculations were carried out after acquiring the necessary data for their evaluation. These indices mainly allow for measuring the urban patch and understanding its spatial configuration.

The morphological shape indices can be calculated using mathematical formulas. In the two equations of these two indices, (S) represents the surface area of the shape, (A) represents the built-up area, and (P) denotes the perimeter. The data necessary to calculate these two indices are obtained using geographic information systems (GIS).

These two methodological approaches allow for a better understanding of the evolution of the urban sprawl of Batna. It allows for the quantification and analysis of spatiotemporal variations within the city, thus providing essential information for urban planning and management.

FIG. 5 THE LAND USE MAPPING PROCESS



RESULTS AND DISCUSSION

• **Study of changes in LULC 1986-2019** – The evolution of urban land use was selected as a determining factor to study the phenomenon of urban sprawl. A supervised classification method, involving the Maximum Likelihood algorithm (specified in the "Supervised Classification" section), was implemented using the ArcGIS platform to analyze the spatiotemporal evolution of land use. In the context of the classification, three distinct categories of land use were identified (Table IV):

– Urban Area: Shown by white areas, signifying built-up areas.

– Bare land: Brown areas indicate unbuilt land.

– Vegetation: Found in green areas.

The built-up area has increased according to the Fig. 1. With an increase of +273.61 ha, it went from 2212.11 ha in 1986 to 2485.71 ha in 2000; between 2000 and 2019, it also increased by +1429.83 ha. However, the category of bare soils has decreased in area, estimated at -1111.77 ha between 1986 and 2000,

and at -793.21 ha between 2000 and 2019. The other classes convert the lost part. Vegetation thus recorded a projected surface gain of +838.26 ha between 1986 and 2000 and a loss of -631.62 ha between 2000 and 2019; the land use/land cover maps for the years 1986, 2000, and 2019 are presented on Fig. 6. Allow the observation of changes in the different categories of land use and land cover (LULC) over time (Fig. 6).

Table IV Changes in the land cover in the city of Batna, between 1986 and 2019

Land use class	Area (Ha)			Change (Ha) (+/-)	
	1986	2000	2019	1986 to 2000	2000 to 2019
Urban area	2212.11	2485.71	3915.54	+273.61	+1429.83
Bare land	7083.18	5971.41	5178.42	-1111.77	-793.21
Vegetation	2418.30	3256.47	2624.85	+838.26	-631.62

The data presented in Fig. 1 and the maps in Fig. 6 suggest that the period from 1986 to 2000 was marked by rampant urbanization and the spread of illegal housing, reflecting a chaotic expansion in all directions. The significant migratory influx observed in the city during the so-called "dark decade" in Algeria, combined with the concentration of economic and industrial sectors, contributed to the exacerbation of this situation.

The rapid increase in population led to a rise in demand for land for housing construction, to the detriment of agricultural and forest lands. This dynamic has favored uncontrolled and unregulated urban growth. Despite the urban planning policies in place, the city of Batna experienced unregulated urban expansion between 2000 and 2019.The urban expansion of the city, which mainly occurred along the main roadways, has led to continuous development of built-up areas along these routes. Unregulated urbanization has caused irreversible consequences on the natural environment, leading to its degradation and the conversion of fertile agricultural lands into urban areas. This transformation has rendered the soils impermeable and mineralized by concrete and asphalt. As a result, the air and surface have experienced an increase in their temperature (Chetara, 2023: 172-173), leading to a worsening of atmospheric and surface pollution.

The findings of this research highlight the widespread and sparse character of the city of Batna, making it potentially vulnerable to the impacts of climate change. These changes can lead to an alteration of its local climate, which results in fluctuations in energy and thermal balance.

- **Urban density calculation** – Urban density is an indicator used to evaluate the evolution of the built-up area in Batna and its densification. In percentage terms, this is the relationship between built area (P) and total city area (A): P/A. This indicator shows the degree of urbanization as well as the percentage of land used for construction. The analysis of this indicator makes it possible to understand the spatial evolution of Batna over time, thus highlighting development trends and the effectiveness of urban planning strategies (Fig. 1). The data shown in Fig. 1 above reveals a clear trend towards growth of built-up area, leading to a significant increase in the urbanization rate of the city of Batna. There is also an increase in the percentage of built-up areas, which reflects a high dependence on agricultural and natural resources.

- **Urban compactness** – Urban compactness was quantified using the morphological index of Gravelius (Maignant, 2005), an index used to evaluate a city's structural configuration (Honvo, Dossou-Yovo, 2021: 6). It also measures the degree of fragmentation or compactness of the urban fabric. The index reaches high values when fragmentation is pronounced. To calculate this, the perimeter "P" and area "S" of the built area must be

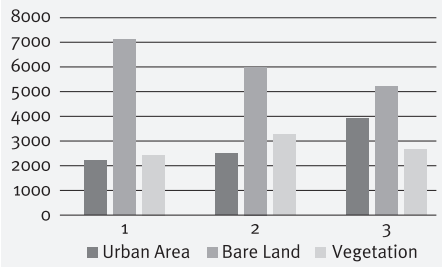


Table V Gravelius index

Year	1986	2000	2019
Built area (km²)	22.1211	24.8571	39.1554
Perimeter (km)	73.737	82.857	130.518
Gravelius index	4.423	4.689	5.885

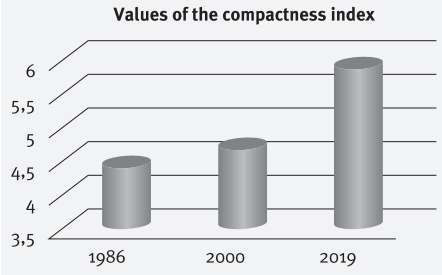
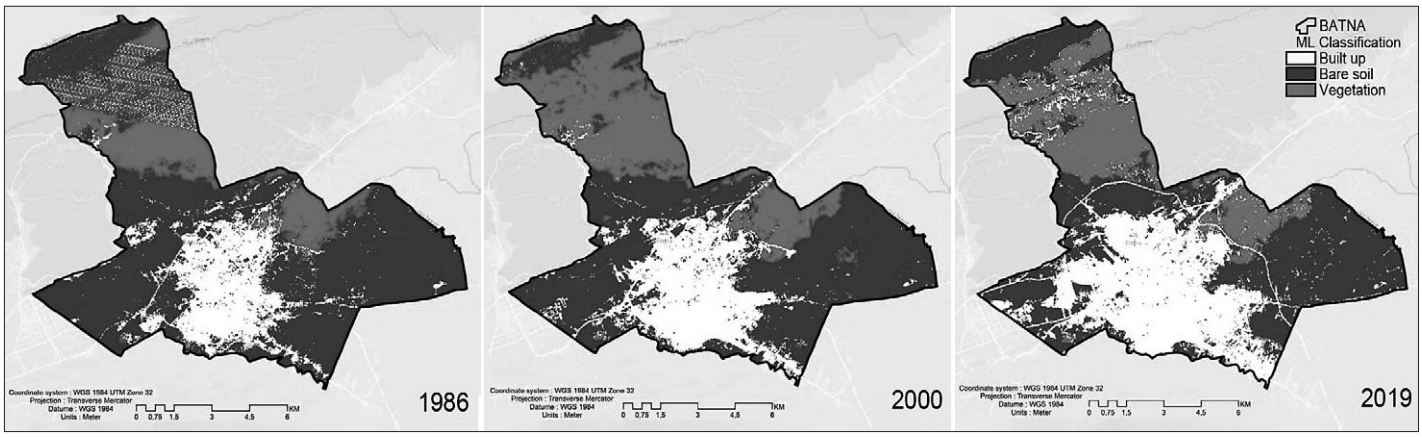


Fig. 6 Spatiotemporal evolution of the city of Batna for the years 1986, 2000, and 2019 (Urban area in white)



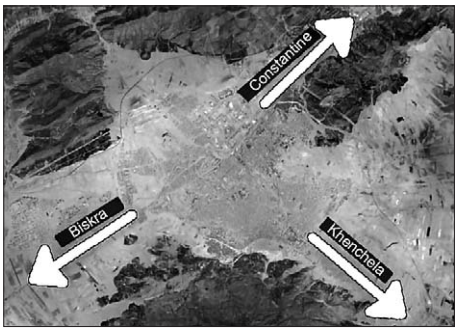


Fig. 7 Urban sprawl directions

known (Saouli et al., 2020: 827). The data required for this calculation are extracted from satellite images combined with geographic information systems (GIS) for the period covering 1986-2019 the entire territory, is formulated as follows:

$$K = \frac{P}{2\sqrt{\pi S}}$$

Where:

- K is the Gravelius index,
- P is the perimeter of the built-up area,
- S is the area of the built-up zone.

The data are presented in Table V.

The analysis of the data in Fig. 1 reveals a significant expansion of the city of Batna over the past decades. This trend is illustrated by a notable increase in the compactness index, which stands at over 1, indicating a sprawling urban form. Indeed, in 1986, the compactness index was 4.42, suggesting a relatively low urban compactness compared to today. However, it should be noted that this value showed an upward trend, reaching 4.68 in 2000 and 5.88 in 2019, respectively. This evolution suggests an increasingly significant expansion of the city of Batna over time.

The compactness index highlights a built urban expansion in Batna that has been characterized by spatial dispersion in all directions. The trend can be interpreted as a reflection of poor urban planning, characterized by the absence of a coherent spatial development strategy. This situation is due to a shortage of land and the saturation of the central urban fabric, caused by the presence of several artificial obstacles, such as the industrial and military zones, and natural constraints, such as the mountainous terrain and the presence of rivers. This expansion follows three main axes: towards Constantine in the north towards Fésdis, towards Biskra in the south towards the Oued Chaâba, and towards Khenchela in the east towards the Tazoult road. An in-depth analysis of the area in question reveals a predominance of individual dwellings, with the presence of a few collective groups forming a loose and discontinuous fabric (Fig. 7).

Conclusion

Remote sensing technologies and Geographic Information Systems (GIS) are useful tools for obtaining accurate spatial data on land use and occupation characteristics. These data are crucial for making informed and strategic decisions on sustainable urban planning. The present study aims to analyze the spatio-temporal urban growth of the city of Batna, in Algeria, over three different periods from 1986 to 2000-2019. This analysis is part of a methodological approach based on the use of satellite imagery and the application of morphological indices, allowing an in-depth quantitative assessment of the city's evolution.

The diachronic study of the urban evolution of Batna revealed an expansion towards an elongated, less compact form, marked by a fragmented geometric configuration. This has exceeded the initial limits set by the planning documents.

Spatial analysis of land use revealed variations in the rate of urban area spatial growth, which accelerated during the period 2000-2019. The urban growth observed in recent decades is marked by a fragmentation of the territory along transport routes, especially national roads (RN 03 and RN 31). This fragmentation has influenced the current direction of urbanization, with urban extensions developing on the periphery of these axes, far from existing urban centers. This configuration has contributed to the creation of a loose and dispersed urban network. This is due to two main factors. First, the scarcity of available land, combined with the topography of the site, characterized by mountainous exposure and a dense hydrographic network, contributed to the formation of this landscape.

The results obtained also show that densification remains one of the most promising solutions to slow down urban sprawl, as there is a direct and negative link between urban sprawl and densification; the latter allows for a rational use of natural lands while preserving them for future generations by building the city upon itself. Although urban densification has advantages in the fight against urban sprawl to control it rather than stop it, given that it is a natural and logical phenomenon that accompanies population growth, it cannot be considered the only solution. It must be accompanied by other strategies to achieve sustainable development goals. Conversely, urban densification can create significant nuisances within cities, especially if it is poorly managed, such as air pollution, urban heat, noise disturbances, and traffic congestion, among others. In this context, and with the aim of improving urban quality of life, it is essential that various policies be implemented.

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Sources of figures and tables

Fig. 1	Authors
Fig. 2	Derived from: https://www.actualitix.com/ (adapted by authors)
Fig. 3	Derived from: https://d-maps.com/ (adapted by Authors)
Figs. 4-6	Authors, 2021
Fig. 7	Google Earth (adapted by authors, 2021)
Tables I-V	Authors

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Fig 1. Haydarpaşa German School at the beginning of the 1900s, students and parents stood in front of the western façade in the courtyard

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Modern Educational Building in Late Ottoman Istanbul: Haydarpaşa German School

colonial
educational buildings
Haydarpaşa German School
Istanbul, Turkey
late Ottoman period

In the late Ottoman period, foreign schools played a crucial role in educational modernization and cultural diplomacy. The Haydarpaşa German School, located in Istanbul and established as a branch of the Galata Bourgeois School, exemplifies Ottoman-German interaction in education and colonial architecture. Archival records reveal complex negotiations between the Ottoman administration and the German Embassy, reflecting broader geopolitical and cultural imperialist dynamics. The school follows the city school model, a disciplinary architectural approach emphasizing hierarchy, control, and efficiency, aligning with late 19th-century German pedagogical principles. A comparative analysis of the Galata Bourgeois and Yedikule German Schools shows that all three institutions adhere to the city school typology. Unlike the prevailing Neo-Ottoman or Orientalist styles, these schools adopted a rigid, regimented design, serving as tools of cultural imperialism. Its transformation after World War I and integration into the Turkish education system reflect shifts in foreign educational policies. Recent restoration efforts balance historical preservation with contemporary needs. This study positions the Haydarpaşa German School as both an architectural artifact and a colonial instrument, contributing to discussions on cultural imperialism, modernization, and education in the late Ottoman period.

INTRODUCTION

Foreign schools in the Ottoman Empire expanded significantly during the 19th century, spurred by the *Tanzimat* (Reorganization) (1839-1876) and *Islahat* (Reform) edicts, which granted non-Muslims educational rights and property ownership. Protestant missionaries, initially targeting Muslims, later focused on non-Muslim communities, using schools for religious and cultural influence (Kılıç, 2005: 72).[1]

From a broader historiographical perspective, Foucault (1999: 16) critiques traditional historiography, arguing that historical analysis should move beyond continuity-based narratives, such as tradition and trace, and instead focuses on rupture and limit, highlighting how institutional transformations signify fundamental shifts in governance and ideology. Within this framework, the period from Tanzimat (1839) to the end of World War II (1945) represents Turkey's modernization phase, characterized by radical restructuring in education, architecture, and state policies. The proliferation of foreign and missionary schools during this period, including the Haydarpaşa German School examined in this study, reflects a break from pre-Tanzimat Ottoman educational traditions and aligns with the broader transition toward a centralized, European-influenced education system.

This study focuses on the Haydarpaşa German School, located in Istanbul's Kadıköy district, which exemplifies the intersection of foreign educational policies and urban modernization. It employs a multidisciplinary framework that integrates colonial imperialism, colonial architecture, and spatial politics to analyze the school as both an educational institution and a geopolitical instrument. Foucault's (1977: 141-195) concept of space as a political and ideological construct provides an analytical foundation for understanding how colonial architecture functioned as an aesthetic or functional entity and as a mechanism of governance, discipline, and cultural dominance. Within this framework, educational institutions in colonial contexts were not neutral spaces but instruments of power, reinforcing ideological structures through spatial organization, legal status, and administrative policies.

The Haydarpaşa German School's architectural layout, spatial organization, and diplomatic status can thus be interpreted as part of a broader strategy of modernization and social control, reflecting the Ottoman Empire's evolving imperial strategies of discipline and adaptation to European models. Colonial imperialism extends beyond economic and political dominance to include the built environment, whereby educational institutions played a central role in embedding Western ideological structures. The study's case Hardarpaşa German School, exemplifies how architectural forms and educational policies converged to reinforce social hierarchies, shaping both spatial practices and ideological control.

To analyze the spatial and ideological dimensions of colonial educational institutions within the broader context of modernization and cultural imperialism, this study employs the interpretive-historical method, which synthesizes narrative and analytical approaches to structure research findings (Groat, Wang, 2002: 138). This method relies on primary data, including archival documents analyzed and critiqued for the first time by the researcher (Bell, 1999: 125). A significant component of this research is the examination of archival sources from the *Devlet Arşivleri Başkanlığı* (Directorate of State Archives), which include government correspondences, licensing documents, and architectural plans. These materials provide critical insights into the bureaucratic negotiations and diplomatic tensions between the Ottoman and German states, particularly regarding the legal status, student composition, and educational policies of the school.

1 This article is based on a thesis study and represents an extended analysis of that research.

This study combines architectural historiography, archival research, and critical theory to examine the Haydarpaşa German School as a product of Ottoman-German diplomatic negotiations, modernization policies, and foreign educational strategies. By integrating archival documentation, architectural analysis, and theoretical insights, the research situates the school within the broader discourse on Ottoman-German educational relations, spatial organization, and modernization. Through this approach, the study explores how architecture, diplomacy, and power intersected in the late Ottoman period, shaping both the built environment and the ideological frameworks governing education and foreign influence. Additionally, by utilizing primary archival sources and architectural plans, the research highlights the Haydarpaşa German School's role as a cultural bridge between the Ottoman and German Empires, emphasizing its dual legacy as both a historical artifact and a living cultural institution.

Foreign Schools and Cultural Imperialism in the Late Ottoman Period

The Tanzimat Period marked a turning point in Ottoman modernization, enabling non-Muslims to establish schools aligned with their values (Ergin, 1977: 413; Aşkın, 2017: 977). Armenians, Greeks, and Jews founded schools emphasizing modern sciences, mathematics, and Western languages, fostering ties with Europe (Kaan, 2021: 357; Shaw, 2023: 86; Vahapoğlu, 1992: 70). The 1869 *Maârif-i Umumiye Nizamnamesi* (1869 Public Education Regulation) secularized education and improved oversight of non-Muslim and Western schools, promoting coexistence and modernization across communities (Bozaslan, 2015: 313). The Ottoman Empire, although not a direct colony of Western powers, became a region of cultural influence, particularly from the second half of the 19th century onward, through architectural, educational, and economic projects. In this regard, the increasing presence of Western powers – especially Germany – can be analyzed within the framework of cultural imperialism.

Cultural imperialism is broadly defined as the process through which certain cultural products attain dominance in another culture due to the influence of political or economic power. This concept, though established, has faced criticism for oversimplifying cultural interactions by underestimating the agency of local cultures (Dunch, 2002: 303-305). As Tomlinson argues (1991: 25, 174-178), cultural imperialism is not always an intentional hegemonic project but often an outcome of global modernization processes. It operates through non-coercive means such as education, media, and cultural policy, thereby allowing dominant powers to assert influence over others without formal colonization (Moema, 1979).

Germany's approach to colonial expansion in the late 19th and early 20th centuries reflects this model of cultural imperialism. Rather than emphasizing territorial conquest, German policy revolved around economic penetration and infrastructural investment, notably via projects such as the Anatolian and Baghdad Railways. These ventures, supported by Deutsche Bank and firms like the Deutsche Handelsverein (est. 1880) and Deutsche Levantelinie (est. 1889), challenged British economic dominance and reinforced Germany's industrial ambitions (Christensen, 2017: 85-86). Labor hierarchies in these projects illustrated a multiethnic composition, with Germans occupying upper-level positions, while Turks, Greeks, Armenians, Italians, and Kurds formed the lower ranks. Between 1840 and 1906, German colonial ideology developed along two main axes: *emigration*-based cultural preservation and *economic colonialism*, the latter focusing on integrating colonies as extensions of the German economy rather than settlements (Smith, 1974: 641-645). This approach aligned with Germany's broader imperial vision, wherein economic infrastructure and cultural institutions operated in tandem to extend geopolitical influence.

Through these infrastructure networks, Germany institutionalized its presence in the Ottoman Empire, simultaneously projecting soft power via education. The Haydarpaşa German School, for instance, established in the early 20th-century Istanbul, symbolized Germany's broader geopolitical aspirations. Its architectural design and curriculum aligned with Germany's strategy of using educational institutions as instruments of cultural diplomacy (Kurmuş, 1974; Ortaylı, 1983; Yargıcı, 1972). As in other non-European territories, German schools in the Ottoman context operated as tools for ideological alignment, using education and architecture to assert hegemony and promote cultural values (Moema, 1979). These developments were closely tied to the Ottoman-German alliance, which gained momentum in the years leading up to World War I. The partnership was driven by mutual political, economic, and cultural interests, with Sultan Abdülhamid II and Emperor Wilhelm II fostering strategic cooperation (Gencer, 2003: 272). Recognizing the Ottoman Empire's economic and geopolitical vulnerabilities, Germany leveraged its investments in infrastructure, edu-

cation, and cultural institutions to institutionalize its presence within Ottoman modernization efforts (Baytar, 2010: 59).

This phenomenon was not unique to Germany. Western missionary schools across the empire also played a significant role in disseminating cultural values, promoting Western frameworks while serving imperialist ambitions (İnalcık, 2003: 181). They offered social services such as healthcare, but often clashed with state policy and raised concerns about national unity (Şahin, 1980: 124). The Second Constitutional Period (1908-1918) brought reforms in native language education and women's schooling, marking an internal response to external cultural pressures and contributing to the formation of a national consciousness (Sonyel, 1999: 396; Karal, 1993: 18; Akbayar, 1985: 1444).

Educational institutions, therefore, must be understood as key instruments in the construction of ideological hegemony. As Bourdieu's (2015: 536-537) *Field Theory* suggests, educational institutions are central to the reproduction of cultural capital, reinforcing dominant ideologies and social hierarchies. Similarly, Martin Carnoy argues that capitalist education policies function as tools of both economic and ideological domination (Bowman, 1976: 833-841). Within this framework, Western-established schools in colonial and semi-colonial territories facilitated integration into global capitalist systems, promoting dependency and cultural assimilation (Koehl, 1975: 276-281; Herlihy-Mera, 2017: 33).

In the Ottoman context, these institutions shaped both individual identities and the built environment. Architectural choices were deeply symbolic; schools became visual markers of ideological presence and spatial manifestations of cultural imperialism (Arığ, 1999: 176). As Henry H. Hessup succinctly stated: "The basic condition for missionary success is schools" (Kılıç, 2005: 73). By the early 20th century, educational institutions had become integral to the social organization of non-Western territories undergoing modernization (Ünal, 2023: 241-242). Western and non-Muslim schools not only contributed to the economic mobility of their communities but also facilitated their integration into Ottoman modernization efforts (Ekinci, 2012: 319). However, insufficient state oversight allowed foreign curricula and religious doctrines to influence Ottoman students, raising concerns about cultural and ideological infiltration (Doğan, 2021: 79).

German schools in the Ottoman Empire exemplified this dual function. The *German Protestant Congregational School* in Beyoğlu (1850) initially served German-speaking settlers but later expanded its student base. The *German and Swiss Neighborhood School* (1868), later renamed the *Bourgeois School*, evolved into today's Istanbul Private German High School (Mutlu, 2020: 115, 117). Following Prussia's 1871 unification, Germany established eleven schools across Ottoman territories – including İzmir, Aydın, Jerusalem, and Jaffa (Atar, 2022: 220). Institutions such as the *Yedikule German School* (1875) and the *Bebek German School* (1896) – later relocated to Elazığ – further extended Germany's educational footprint (Mutlu, 2020: 117; Atar, 2022: 220). By 1915, Germany had expanded its presence to thirty-nine schools across the empire. These schools advanced a cohesive German identity and aligned with geopolitical investments such as the Baghdad Railway (Atar, 2022: 220). As extensions of German cultural policy, they played a key role in integrating Ottoman territories into a broader imperial vision, consolidating influence through education rather than conquest.

HAYDARPAŞA GERMAN SCHOOL AS A BUILDING OF COLONIAL ARCHITECTURE: DIPLOMATIC, ARCHITECTURAL AND EDUCATIONAL FEATURES

According to Henry Lefebvre (1976), space is not merely a neutral container but a product shaped by historical and political processes, infused with ideological structures that serve specific power relations. Architectural spaces, including educational institutions, are produced as part of deliberate or subconscious political strategies, reinforcing dominant cultural and social hierarchies.

Colonial architecture, beyond its functional and aesthetic dimensions, operated as an ideological tool that reinforced the political and cultural dominance of colonial powers over indigenous societies. Djiar (2009) argues that the built environment does not merely reflect colonial authority but actively constructs cultural hierarchies and perceptions. Similarly, James-Chakraborty (2021) highlights that colonial powers employed architecture as more than just physical infrastructure; it functioned as a means of asserting cultural dominance, embedding Western narratives within local landscapes. This architectural framework symbolized Western modernity while simultaneously transforming indigenous identity perceptions. Furthermore, colonial architecture was intrinsically tied to economic exploitation, as Western capital and technology were integrated into local contexts, facilitating both material extraction and geopolitical influence. Rather than solely

enforcing spatial control, colonization introduced new administrative systems, construction materials, and spatial organization techniques, permanently embedding colonial influence into the built environment.

German colonial architecture exemplified these dynamics, serving as both a functional and ideological mechanism that reinforced racial and economic segregation through spatial organization. In colonial cities, European and indigenous populations were systematically assigned separate quarters, and these divisions were further entrenched through architectural planning (Bernbeck, 2024). The German administration actively employed urban design to materialize social hierarchies, ensuring the continuity of colonial dominance. By creating distinct living spaces for Europeans and indigenous communities, German colonial architecture transcended mere aesthetics, functioning as a structural instrument that institutionalized racial and cultural segregation. This spatial strategy was not limited to residential areas but extended to educational institutions, as foreign schools in the Ottoman Empire became more than centers of learning; they served as architectural manifestations of Western diplomatic and cultural influence, reinforcing geopolitical hegemony in the region. In this framework, foreign schools in the Ottoman Empire should not be regarded merely as educational institutions but as spatial projects reinforcing Western technological, economic, and cultural influence in the region.

The Kadıköy Haydarpaşa German School illustrates how German colonial strategies intertwined education with infrastructural expansion. Its location near Haydarpaşa Train Station (Fig. 2), a crucial trade hub, reflects Germany's broader geopolitical ambitions. Initially, German engineers and railway employees working on the Haydarpaşa-Baghdad Railway project sent their children to the German Bourgeois School in Galata, necessitating the establishment of a more accessible institution. Recognizing this need, the German Embassy proposed its establishment as a branch of the Galata Bourgeois School in 1903. By 1904, the school was fully operational, providing education aligned with German standards (Mutlu, 2020: 116; Salman, 1994: 30).

The school's foundation and early operations further reinforce its role within Germany's infrastructural and cultural expansion in the Ottoman Empire. Initially operating from a rented location at "Osmanağa Mahallesi, Rıhtım Caddesi," the school officially received its license on September 16, 1895, under the leadership of Monsieur Möhring. It started with ninety-four students and a teaching staff of five, including one Ottoman citizen responsible for teaching Turkish (Atılgan, 2021: 104). This integration of German educational policies with local administrative requirements underscores how colonial architecture and education functioned as intertwined mechanisms of cultural imperialism, embedding German influence into Ottoman modernization efforts.

Fig. 2 Haydarpaşa train station in 1908

With growing enrollment, on April 29, 1902, the General Assembly of the Bourgeois School Association approved the school's expansion as a branch of the Bourgeois School. A new building was planned on *Rıhtım Caddesi*, with permission granted in 1903 (Somel, 2021: 56).[2] Schwatlo(w), who also worked as the design architect for certain sections of the Bourgeois School, was responsible for designing the Haydarpaşa German School building (Fındıkgil, 2002: 323). Documents from the Railway Company, specifically from February 26, 1903, indicate that the German ambassador was asked to support the merger and provide financial assistance for the new school (Fındıkgil, 2002: 322). The cost of Schwatlo(w)'s project was calculated by architect Vallaury to be 2059 Liras. German newspapers from May 5 and 6, 1903, reported that 5,500 Marks were allocated from imperial coffers to support the school's construction. The Anatolian Railways also contributed 2,500 lira and provided the land on which the school was built (Fındıkgil, 2002: 323).

On March 15, 1904, the administration of the Galata German Bourgeois School informed the German Consulate that the Haydarpaşa

2 Today, Rıhtım Caddesi (Rıhtım Street) is referred to as İskele Sokak (Iskele Street).

German School (Fig. 1) officially opened on October 22, 1903, on the birthday of the German Empress, with the participation of the German ambassador. A report on October 28, 1903, confirmed that the building, including accommodation for the teachers, a nursery, and a nun to run the kindergarten, was completed (Somel, 2021: 58). However, a document from the Ottoman Archives, dated M-5 July 1904 (DSA, İ. AZN. 56/19), contradicts this opening date, stating that construction was only just completed at the time. Additional details regarding this discrepancy are discussed in the building description section. The final construction cost reached 135,000 Deutschmark, funded by German industry and the directors of the Galata Bourgeois School (Fındıkgil, 2002: 323).

By 1905, the school had four primary classes, a kindergarten, and accommodation for four teachers. Despite improved facilities and reduced fees, enrollment remained lower than expected due to competition from a nearby French school (Somel, 2021: 62).[3] By 1910, reports confirmed the school's growth, reaching 126 students in 1905-1906, its highest enrollment rate (Mutlu, 2020: 117).

In 1914, 220 individuals participated in German language courses, including 40 Anatolian Railway Company employees, whose lessons were funded by the company to promote German linguistic influence (Sarı, 2011: 241). However, following World War I, the Ottoman government revoked foreign privileges on July 28, 1914, forcing the school's relocation to alternative venues.[4] During the Armistice period, Scottish troops occupied the school (Mutlu, 2020: 126).

In 1923, the Republic of Turkey purchased the building, renaming it *Osmangazi Primary School* in 1949 (Fındıkgil, 2002: 325). It continued to operate under the Ministry of National Education until its temporary closure for restoration in 2019.

THE LICENSING AND DIPLOMATIC PROCESS FOR THE HAYDARPAŞA GERMAN SCHOOL

Documents from the *Devlet Arşivleri Başkanlığı* (Directorate of State Archives) provide critical insight into the bureaucratic process of establishing the Haydarpaşa German School. The correspondence between the Ottoman State and the German Embassy follows a hierarchical structure, with approvals required from the Ministry of Foreign Affairs (*Hâriciye Nezâreti*), the Grand Vizierate (*Bâb-ı Âlî*), the Ministry of Education (*Maarif Nezâreti*), and the Council of State (*Şûra-yı Devlet*) (DSA, ŞD. 2732/6: 1-3). The German Embassy's initial request in June 1903, driven by practical concerns related to commuting difficulties faced by German railway employees' children, marked the beginning of intensive bureaucratic deliberations (DSA, ŞD. 2732/6: 1).

Despite initial approvals, significant cultural and administrative concerns surfaced, particularly regarding the potential establishment of a "German colony" in a predominantly Muslim neighborhood (DSA, İ. HUS. 17/126: 1). However, the absence of legal obstacles allowed the school's construction on land leased from the *Dârüssâde Ağa İbrahim Ağa Vakfı* (DSA, ŞD. 2732/6: 3). The school site was bordered by Ahmed Bey's house and garden on one side, Emine Fitnat Hanım's house on another, the Nahlizâdeler garden, and the Dock Pier. The land, calculated at 1396 *zira*[5], was designated for a branch of the Galata Bourgeois School. According to official records, the school's final dimensions were 25 meters and 45 centimeters in length, 15 meters in width, and a total area of 325 square meters. The building, constructed in solid stone, was projected to be 12 meters high. The planned structure, strategically located adjacent to prominent local properties, symbolized the embedding of German influence within the urban landscape, aligning with theoretical insights from Djiar (2009) and James-Chakraborty (2021).

Throughout 1904, debate intensified around mixed education involving Muslim and non-Muslim students. Ottoman authorities repeatedly expressed reservations and mandated strict segregation policies (DSA, İ.AZN. 56/19: 5, 9). Despite these restrictions, diplomatic pressures from Germany influenced administrative decisions, culminating in a significant policy shift. Although a formal approval in May 1904 permitted diverse enrollments, persistent administrative concerns delayed final licensing, generating diplomatic tensions (DSA, BEO. 2334/174981: 1; BEO. 2531/189780: 5).

By July 1905, ongoing diplomatic pressure prompted the Ottoman government to officially authorize mixed education, marking a turning point in educational policy on July 22, 1905, officially finalizing the school's licensing process (DSA, BEO. 2627/196971: 1). The case underscores the complexities highlighted by Bernbeck (2024), demonstrating how German colonial projects deliberately institutionalized cultural and spatial segregation, yet were pragmatically adjusted due to diplomatic considerations.

However, the openness to mixed education faced renewed scrutiny after the Committee of Union and Progress came to power post-1913. Stricter regulations and taxation policies implemented in 1909 reflected the Otto-

man government's determination to limit foreign schools' cultural influence and assert national sovereignty (DSA, ZB. 340/86: 1-7; İ.DFE. 23/41: 1-3). The extensive archival record of the Haydarpaşa German School licensing process reveals the deep interconnectedness of educational, diplomatic, and cultural factors during the late Ottoman period. This institution emerged as a critical site for ideological negotiation, cultural tension, and administrative complexity, encapsulating broader colonial dynamics and highlighting the intricate balance Ottoman authorities sought between foreign influence and national integrity.

The detailed archival records discussed in this section are succinctly summarized through three tables provided at the end of this chapter. These tables outline the key developments in the licensing process (Table I), economic information regarding financial contributions (Table II), and a chronological summary of governmental negotiations (Table III).

Architectural Features of Haydarpaşa German School

The Haydarpaşa German School, situated in Rasimpaşa Neighborhood on İskele Street, is a registered second-degree cultural heritage building. It occupies plot 51, block 195, parcel 33 and faces İskele and Nemlizade Streets. The structure includes a basement, ground floor, first floor, and attic, with a 27×42-meter footprint and a 375 m² main area within a 1,134 m² parcel. The eclectic-style building has a visible basement, ground, first, and second floors at the entrance, while the rear façade only reveals the basement, ground, and first floors. Set 2.40 meters back from İskele Street, it has a 40 m² inner courtyard

Table I Key developments in licensing process of the Haydarpaşa German School

Date	Key developments	Archive reference
June 22, 1903	German Embassy formally requests permission to establish the school.	DSA, ŞD. 2732/6: 1
June 25, 1903	Ottoman government approves site proposal at parcels 18 and 20, Rıhtım Caddesi, Kadıköy.	DSA, ŞD. 2732/6: 2
July 23, 1903	Report raises concerns about creating a "German colony," but no legal barriers found.	DSA, İ. HUS. 17/126: 1
October 14, 1903	Ministry of Foreign Affairs finalizes lease and construction plans.	DSA, ŞD. 2732/6: 3
March 7, 1904	General Directorate of Foundations confirms no objections. Final decision with Council of State.	DSA, ŞD. 2732/6: 7
May 6, 1904	Grand Vizier permits the school, allowing enrollment of various nationalities.	DSA, BEO. 2334/174981: 1
June 11, 1904	Council of State approves construction but stipulates separation of Muslim and non-Muslim students.	DSA, İ.AZN. 56/19: 4
July 5, 1904	Construction officially completed.	DSA, İ.AZN. 56/19: 1
July 13-28, 1904	Ministry of Education reiterates objections to mixed student enrollment.	DSA, İ.AZN. 2368/177550: 1; BEO. 2380/178498: 2
July 31, 1904	School formally recognized under Sultan's earlier decree from 1902.	DSA, BEO. 2424/181768: 4
January 6, 1905	German Embassy raises diplomatic concerns about licensing delays.	DSA, BEO. 2531/189780: 5
July 22, 1905	Final decree permits mixed education, establishing operational framework.	DSA, BEO. 2627/196971: 1

Table II Economic information regarding financial contributions

Date	Economic information summary	Archive reference
July 23, 1903	Annual lease for school land (12,000 *arshin*[6]) established at 84,000 kuruş from M. Huguenin.	DSA, İ. HUS. 17/126: 1
October 14, 1903	Finalized lease arrangement with Dârüssâde Ağa İbrahim Ağa Foundation for school construction.	DSA, ŞD. 2732/6: 3
April 8, 1909	Ottoman government issues regulations imposing new taxation on foreign schools, including Haydarpaşa German School.	DSA, ZB. 340/86: 1-7
September 25, 1909	Council of State mandates school taxation, explicitly rejecting exemptions.	DSA, İ.DFE. 23/41: 2-3
October 5, 1909	Government reiterates no tax exemption will be granted.	DSA, İ.DFE. 23/41: 3
October 20, 1909	Ministries instructed to enforce compliance with taxation policies.	DSA, İ.DFE. 23/41: 1

Table III Summary of governmental negotiations

Date	Negotiation issues	Archive reference
June 22, 1903	German Embassy formally initiates negotiations with Ottoman Ministry of Foreign Affairs for school establishment.	DSA, ŞD. 2732/6: 1
June 25, 1903	Ottoman Prime Ministry confirms initial approval and starts administrative inquiries.	DSA, ŞD. 2732/6: 2
May 6, 1904	Grand Vizier grants permission, allowing diverse student enrollment; administrative debates intensify.	DSA, BEO. 2334/174981: 1
June 11, 1904	Council of State officially permits construction but mandates segregation of Muslim and non-Muslim students.	DSA, İ.AZN. 56/19: 4
January 6, 1905	German Embassy escalates diplomatic pressure due to administrative delays in final licensing.	DSA, BEO. 2531/189780: 5
March 14-29, 1905	Ottoman Ministries emphasize Sultan's approval required for educational policies involving mixed religious student groups.	DSA, BEO. 2607/195481: 4; BEO. 2542/190648: 2
July 3, 1905	Grand Vizier finally approves licensing, reinforcing exclusion of Muslim students despite diplomatic pressures.	DSA, MF.MKT. 783/22
July 22, 1905	Final decree issued, explicitly allowing mixed education and ending prolonged diplomatic negotiations.	DSA, BEO. 2627/196971: 1
April 8, 1909	Regulations introduced to curb foreign educational institutions' influence, affecting German-Ottoman relations.	DSA, ZB. 340/86: 1-7

3 By April 26, 1905, a report from the German Consulate to the German government indicated that 74 of the 94 students were Turkish. 34 of these students were native Turkish speakers and followed Islam. Additionally, 40 adults employed by the Anatolian Railway Company received German language lessons, financed by the company, to promote the spread of German (Atar, 2022: 225).

4 This led to the relocation of the Haydarpaşa German School to different locations, including the Söğütlü Ali Şamil Mansion and a building on Altıyol Rıhtım Street.

5 *Zirâ* was another measurement unit used in the Ottoman world and architecture. Various types of zirâ existed, and in some sources, it is described as the Arabic equivalent of the arşın (Erkal, 1991).

6 The masonry *arşın*, averaging 75.774 cm in length (1 mason's arşın = 24 parmak = 240 hatt), was progressively phased out between 1931 and 1933 following the adoption of the metric system in Turkey (Özdural, 1998).

FIG. 3 SCHOOL'S NORTH FACADE FROM ISKELE STREET

that illuminates the corridor, staircase, and one room (Fig. 3).

The Haydarpaşa German School, despite being constructed in 1905, does not align with the dominant architectural trends of the late Ottoman Empire, which were shaped by eclecticism and Orientalist aesthetics. As Simone Schalz (2015) notes, rigidly disciplined schools were constructed in German cities during the 19th century, commonly referred to as "Schools in Cities". In this context, it would be appropriate to categorize them as *city schools style*. The architectural and pedagogical framework of these institutions was deeply influenced by the rigid school model, which emphasized discipline, hierarchy, and teacher-centered learning. This educational paradigm was reflected in the spatial configurations of school buildings, particularly in Prussia and other German territories, where architectural planning reinforced strict educational control and regimented order (Schalz, 2015; Herrmann, Oelkers, 1994).

City schools were characterized by long, narrow corridors lined with uniformly arranged classrooms, emphasizing centralized teacher authority and student supervision. The spatial organization minimized student interaction and encouraged a controlled learning environment, mirroring military barracks both in layout and function. These schools adhered to principles of efficiency, uniformity, and rigid discipline, with structural elements such as large windows for surveillance, minimal decorative details, and a hierarchical distribution of spaces that placed administrative offices and teacher quarters in dominant positions (Kähler, 2004).

This rigid German pedagogical influence is evident in Haydarpaşa's structured layout, where circulation patterns were meticulously designed to facilitate supervision and order. Like the Trier-West School and other city schools, it features long, narrow corridors flanked by uniformly arranged classrooms, reinforcing teacher-centered education and strict spatial hierarchy. This approach starkly contrasts with the contemporary Ottoman schools, which increasingly incorporated Neo-Ottoman motifs, Art Nouveau elements, and a blend of European styles (Kuban, 2010: 606-607, 617-618).

Although some ornamental elements appear in the eaves and pediments, these are superficial additions and do not influence the core architectural organization of the school. The rectangular layout (25.45×15.40 m), symmetrical composition, and controlled circulation patterns reflect a strictly German approach, aligning more with the Trier-West School than with contemporary Ottoman educational buildings. While Ottoman civic buildings of the period embraced ornamentation and stylistic eclecticism, the Haydarpaşa German School remains fundamentally a city school, designed for functionality, efficiency, and discipline rather than aesthetic appeal.

Nevertheless, the school does incorporate minor local adaptations, particularly in the eaves and pediments, which feature subtle Orientalist decorative elements. However, these remain secondary to the dominant German architectural framework, confirming that the school was not a direct adaptation of Ottoman styles but rather a German import with selective ornamental concessions.

Claims suggesting construction materials from Haydarpaşa Train Station were used in the school have been refuted. Fındıkgil (2002: 320) confirms that these materials were instead used for the Valpreda Apartment Building, designed by Valaury and now called "İtalyan Apartmanı", located opposite the school.

Originally, the land extended 2 meters beyond Nemlizade Street, but later, adjacent land was incorporated into the school's garden, leading to the relocation of the WC and an outbuilding. The 1906 Goad map (Fig. 4) shows a rectangular plan, a retracted front façade, and a courtyard providing natural light. However, the 1936 Pervititich map (Fig. 5) reveals new construction reduced the courtyard's light intake, and a single-story wet area structure was added. These modifications defined the current building boundaries, providing multi-access points via the garden.

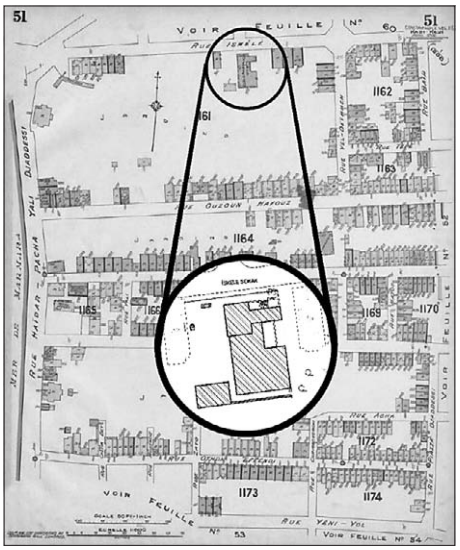
According to the restitution project, the basement originally housed three classrooms, a

coal cellar, and a boiler room, while Fındıkgil's research suggests it also contained service units, storage for teaching tools, and servant quarters. Given the high density of chimneys and the fact that Kadıköy lacked electricity until 1928, the building likely relied on stove heating (Esenduran, 2010: 136).

Material analysis during restoration revealed "Malta Stone" cladding, different from Haydarpaşa Train Station's materials (Palo, 2016). Volta floors were built with masonry walls and blended bricks, using steel "I" profiles spaced 90 cm apart. Mortar-filled cavities formed flat slabs, with plaster applied underneath. Reinforced concrete was used for stairs, which were covered in marble, while lead stair railings were installed. Lime mortar mixed with brick powder, sand, and stone dust was applied for walls and plastering. The terrace roof features 1.05-meter-high brick parapet walls set between 1.45-meter-high concrete pillars. Decorative cast concrete elements embellish the parapets, and 1.80-meter-high chimneys are positioned throughout.

The 1904 plans offer insights into the original design and function of the building, documenting only the ground and first floors, while the basement and second floors are absent from archival records.

The basement floor (Figs. 6 and 7) comprises eight rooms arranged along a central corridor (38 m²), reinforcing the hierarchical and controlled circulation typical of city school architecture. The design of the basement reflects a strict functional zoning, where each room is designated for a specific task, minimizing student movement and promoting teacher authority. Room one (29 m²) and room two (17 m²) have windows facing the side garden, with access to the latter only through the former. This demonstrates a sequential access arrangement that limits free circulation, ensuring controlled movement within the space. Room three (3 m²) and room four (2 m²) have side-garden-facing windows, likely used for auxiliary functions, reflecting the compartmentalized nature of space allocation. Room five (9 m²) includes a door to the back garden, which may have functioned as a service or maintenance area, an example of how city school architecture separated educational spaces from operational areas to maintain strict order. Room six (29 m²) has a window overlooking the garden and direct access via a ramp, suggesting a deliberate control of access points, potentially for logistical purposes rather than unrestricted student use. Room seven (25 m²) features two windows opening to the inner courtyard, which spans 41 m² and provides light and ventilation to the basement and upper levels.



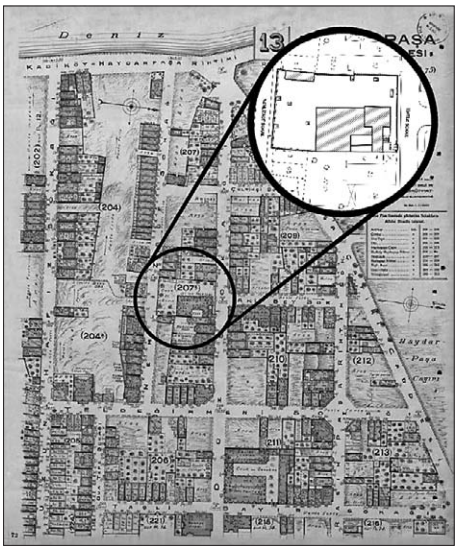


Fig. 4 The 1906 goad map depicting the Haydarpaşa Rihtim District and the site plan of the school

Fig. 5 The 1936 Pervititch map depicting the Haydarpaşa Rihtim District and the site plan of the school

The placement of this inner courtyard follows the efficiency principles of city schools, where natural lighting was strategically utilized to maintain visibility and teacher oversight while minimizing decorative or leisure-oriented spatial arrangements. Room nine (9 m²), located under the staircase, has two windows facing İskele Street. This suggests a designated service or storage area, following the typical city school model of spatial hierarchy, where non-academic functions were confined to marginal spaces to avoid disrupting the regimented classroom environment.

The restitution project reveals functional alterations: room one became a computer lab, while room two was divided into a storage area and an instructor's room. Room three was split into a science lab and staff lodging, and room four was restructured to include kitchen and bathroom facilities. Room five remains intact but now serves as storage. A newly added wall in front of rooms four and five created an 11 m² entrance hall. Room six was converted into a workshop with entry via room seven, which now functions as a heating room.

In the inner courtyard (Space Eight), separate male and female student toilets, along with a teacher's toilet, were installed. The parapet walls of the corridor-facing windows were replaced with doors for direct toilet access. Room nine was converted into a tea room. The staircase remains in its original form, ensuring the historical integrity of the structure.

Drawn at a 1:100 scale (Fig. 6), the ground floor plan differentiates wall types through hatching, highlighting façade and load-bearing walls (DSA, İ.AZN. 56/19: 1). The building measures 25.45 meters in length and 15.40 meters in width, adhering to the rigid, hierar-

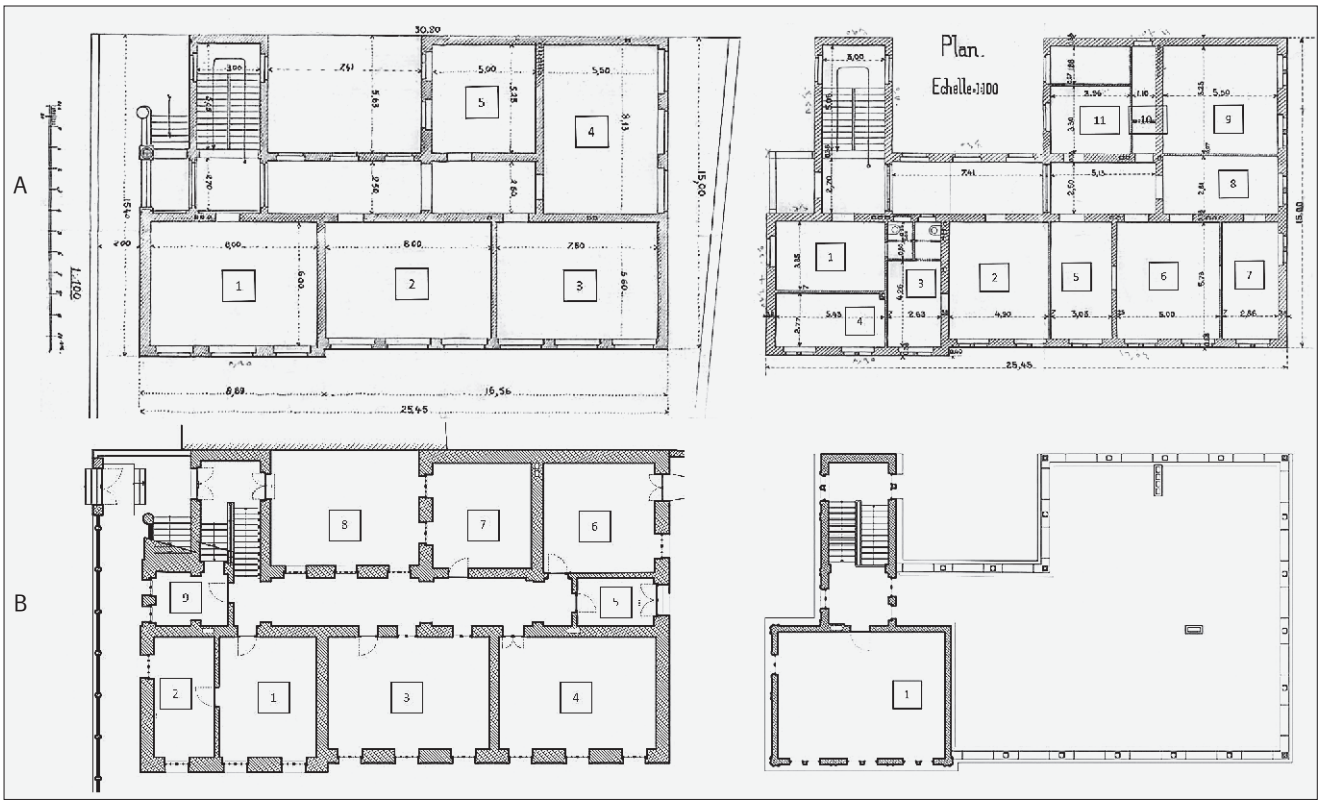


FIG. 6 A) THE ORIGINAL DRAWINGS OF THE HAYDARPAŞA GERMAN SCHOOL, DATING BACK TO 1904, ARE PRESERVED IN THE OTTOMAN ARCHIVES: THE GROUND FLOOR PLAN OF THE BUILDING AT THE LEFT AND THE FIRST FLOOR PLAN OF THE BUILDING AT THE RIGHT; B) THE RESTITUTION PLANS: THE BASEMENT FLOOR PLAN AT THE LEFT AND THE SECOND FLOOR PLAN AT THE RIGHT.

chical spatial organization typical of city schools. Positioned 2 meters from the garden wall on İskele Street, it features a rectangular layout with an inner courtyard that enhances ventilation but also serves as controlled, enclosed space rather than an open, interactive area, reinforcing the pedagogical emphasis on discipline and order. The symmetrical rear façade spans the full 15 meters, further reflecting the formal, regimented design principles associated with German educational institutions of the period.

The main entrance, accessible through a garden gate, leads to a seven-step terrace with a vaulted cover, supporting a first-floor balcony, a feature reinforcing the formal hierarchy of the building. The main door opens into a stair hall connected to the central corridor, which serves as the primary axis of movement, ensuring direct teacher supervision over student circulation. Five primary rooms/classrooms are arranged along this corridor. On the right, three rooms (48 m², 45 m², 44 m²) each feature three windows facing the side garden, allowing ample lighting but maintaining the segregated, enclosed nature of the interior learning environment. The uniform classroom sizes and placement indicate a standardized, non-flexible approach to education, mirroring the regimented structure of city schools. On the left, one 45 m² room faces the back garden with three windows, while the inner courtyard provides light and ventilation. Haydarpaşa's spatial structure strictly separates each classroom, limiting informal interactions among students.

The staircase, aligned with the İskele Street façade, connects the basement and first floors. In city schools, staircases were often positioned strategically to regulate movement and minimize unsupervised student congregation (Schalz, 2015). The entrance structure, initially open on three sides between the façade and garden wall, was later modified to be open on two sides and moved closer to the basement-level entrance (Fig. 8), reinforcing its controlled, structured access system.

The staircase and corridors retain their original dimensions, while certain rooms underwent functional alterations to adapt to changing educational needs. However, these changes did not alter the core hierarchical organization of the space. Room three was subdivided into a classroom and an assistant manager's office, demonstrating the enduring importance of teacher oversight and administrative presence within the school environment. Room four was split into a hall (9 m²) extending toward the backyard and a principal's office (29 m²), emphasizing the

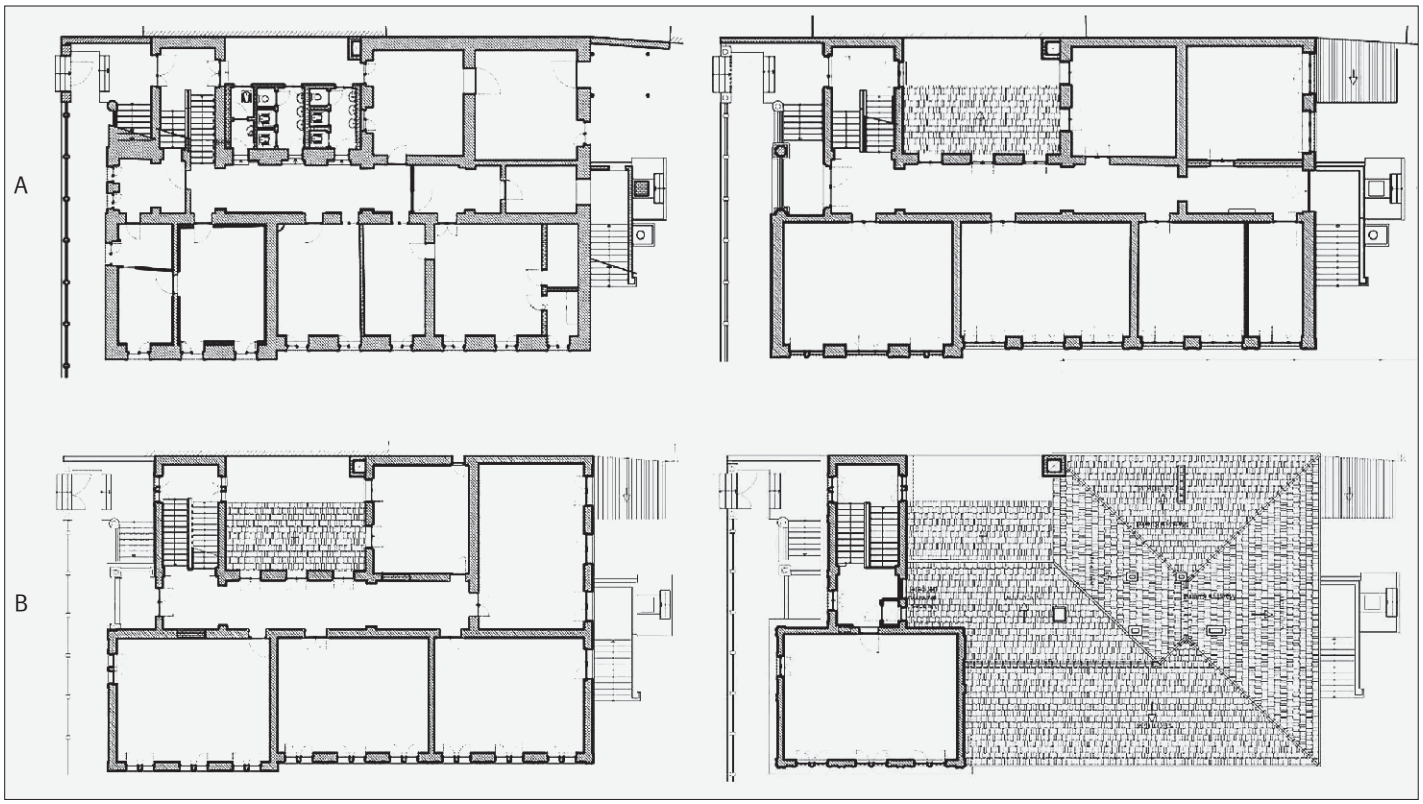


Fig. 7 The survey plan drawings of the Haydarpaşa German School building: A) the basement floor plan at the left and ground floor plan at the right; B) the first floor plan at the left and second floor plan at the right

spatial hierarchy where administrative spaces occupied dominant, central locations, ensuring teacher authority remained a central pillar of the educational framework. A parapet wall of an existing window was replaced with a door, facilitating access to the backyard via a newly added staircase and landing, yet this modification still adhered to the rigid circulation control system that defined city school architecture. Room five (26 m²) remains unchanged as a teacher's room, reinforcing the pedagogical principle of centralized teacher authority. Despite these modifications, the original configuration of the staircase linking the floors has been preserved, maintaining the building's historical integrity and ensuring that its original spatial hierarchy remains intact.

The 1904 first-floor plan of the Haydarpaşa German School (Fig. 6) featured a highly structured and compartmentalized layout, designed to reinforce the hierarchical, teacher-centered educational approach characteristic of city schools. The spatial configuration ensured strict discipline and controlled student circulation, reflecting the pedagogical principles of efficiency, uniformity, and regimented learning environments. The long corridor provided a clear supervisory axis, with classrooms symmetrically arranged on either side, reinforcing the centralized authority of teachers while minimizing student autonomy and informal social interactions.

Over time, significant modifications have been made to adapt the space for contemporary educational needs (Fig. 7), yet the building's core hierarchical organization remains evident. Several original walls were removed to create larger classrooms, shifting from the small, regimented learning spaces of the city school model to a more open, flexible arrangement. However, these alterations do not change the fundamental circulation system, which still follows the linear, supervision-oriented layout typical of German disciplinary schools. Room one (18 m²), room three (11 m²), and room four (15 m²) were merged into a single 49 m² classroom, eliminating partitioning walls and reducing internal divisions. This modification moves away from the rigid, small-group instruction model of the city school and reflects modern educational preferences for larger, collaborative learning environments. Similarly, the wall between room two (28 m²) and room five (17.5 m²) was removed, forming a 45 m² space. However, room five's corridor access was walled up, reinforcing controlled circulation and limiting student movement to predefined pathways, a feature retained from the building's original hierarchical design. Rooms six (29 m²) and seven (16 m²) were combined

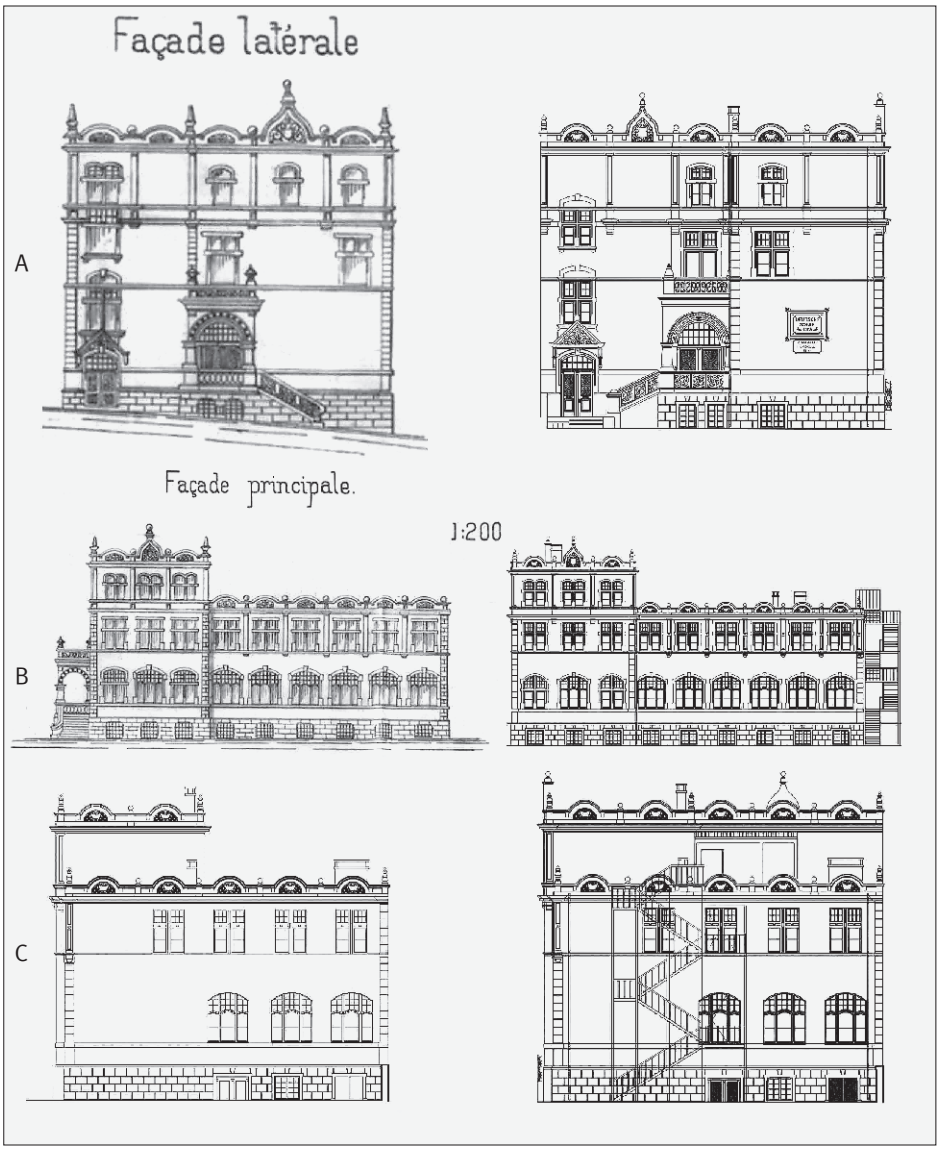


FIG. 8 A) THE NORTHERN FAÇADE IN THE ORIGINAL DRAWINGS OF 1904 AT THE LEFT AND THE CURRENT RESTORATION FAÇADE AT THE RIGHT; B) THE WESTERN FAÇADE IN THE ORIGINAL DRAWINGS OF 1904 AT THE LEFT AND THE CURRENT RESTORATION FAÇADE AT THE RIGHT; C) THE RESTITUTION DRAWINGS OF SOUTHERN FAÇADE AT THE LEFT AND CURRENT RESTORATION FAÇADE AT THE RIGHT

into a 45 m² classroom, and their original connections to room eight (15.5 m²) were closed off, emphasizing the school's preference for centralized access points over interconnected learning spaces. The partition between room eight (15.5 m²) and room nine (29 m²) was removed to create a unified 46 m² classroom, reflecting a shift toward open-plan educational spaces, yet maintaining the traditional corridor-based circulation system. Additionally, rooms ten (6 m²) and eleven (13 m²) were merged into a 30 m² classroom, while the direct connection between rooms eleven and twelve (7.5 m²) was eliminated, reinforcing segmentation and structured student organization.

While the classrooms have expanded, the overall organization of circulation and supervision has remained consistent with the original hierarchical approach. The addition of a modern fire escape to the rear façade introduces a practical update for contemporary safety regulations, but this alteration does not disrupt the rigid, pre-planned movement patterns embedded in the school's architectural DNA.

The partial second floor (Figs. 6 and 7) consists of a single 52 m² room, with windows facing the İskele Street and the side garden. The terrace roof has been restored to its original modular parapet walls and decorative elements, maintaining the building's architectural coherence while ensuring it remains functional for contemporary educational use.

The exterior walls, measuring 38 cm in thickness with 25 cm load-bearing interior walls and 7 cm partition walls, reinforce the structural robustness required for institutional control and supervision. As in many 19th-century German disciplinary schools, the façade design prioritizes function over decoration, ensuring a clear visual hierarchy and controlled circulation. Comparative analysis between the original 1904 plans and the current state (Fig. 8) reveals distinct architectural elements and alterations.

The western façade, designated as the "Main Façade" in archival documents, was drawn at a 1:200 scale and retains its defining features. It incorporates cut-stone cladding at the base and roof molding, with square single windows and railings on the basement level. The ground and first floors feature arched double and triple windows, while parapet walls on the first-floor roof maintain a rhythmic modular design. Though largely preserved, modifications include a fire escape staircase added for zoning compliance and the reconfiguration of the first-floor corner column as vertical cladding.

7 In 1871, a dedicated school building was constructed near Galata Tower. However, the structure suffered significant damage in the 1894 Istanbul earthquake, leading to the school's relocation in 1897 to a new building, which continues to house the institution today (Geser, 2011: 22). The construction of the school's main building commenced in June 1896, under the architectural supervision of Kapp von Gültstein, with financial and administrative support from Wülfing, the director of the Ottoman Bank (Somel, 2021: 45). The building, completed in September 1897, featured 15 classrooms and a conference hall. The school received its official license on January 9, 1897 (Mutlu, 2020: 115). During his visit to Istanbul in 1898, German Emperor Wilhelm II granted the institution the right to issue the same diploma as German high schools, making it the first school outside Germany authorized to do so.

8 Another German school in Istanbul, the Yedikule German School, was established in 1875 by the Rumeli Railways Company. One of its founding figures was O. von Kühlmann, the then-director of the Eastern Railways. Lacking a dedicated building in its early

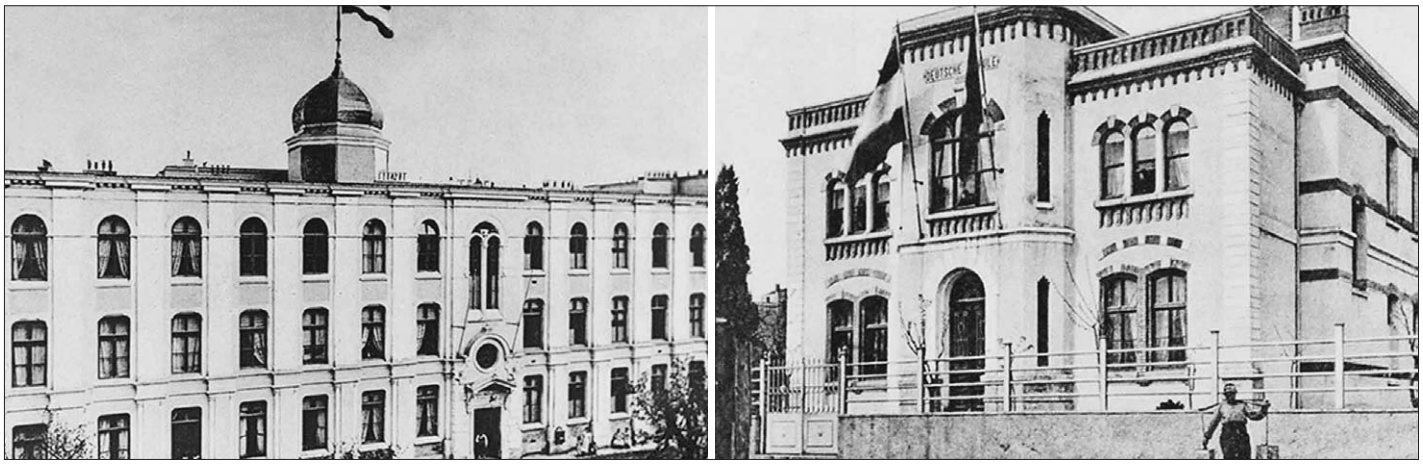


Fig. 9 Images of Galata Bourgeois School (left) and Yedikule German School (right) during the 1900s

The northern façade, identified as the "İskele Street Façade" or "Side Façade" in 1904 plans, serves as the main entrance. Its design includes a seven-step staircase leading to a terrace and a first-floor balcony supported by semicircular Roman arches and decorative columns. The basement features barred single windows with cut-stone cladding. While originally open on three sides, the entrance now has two accessible sides, repositioned closer to the basement-level door. The windows on the upper floors, intended for stairwell illumination, have undergone minor alterations.

The eastern façade, or "Courtyard Façade," absent from archival records, is characterized by plain plastered surfaces framed by cut-stone corner columns. The second-floor parapet walls align with the ornamental rhythm of the structure but are less elaborate, emphasizing functionality over decoration.

The southern façade, or "Rear Façade," also undocumented in archival records, includes two square basement windows and a garden exit door. The ground floor has three arched windows, while the first floor features four windows with flat lintels, linked by continuous moldings.

The parapet walls continue the eclectic decorative rhythm seen on the other facades. Restoration efforts maintained the façade's original dimensions and stylistic elements while incorporating a fire escape staircase to meet modern safety regulations.

The western and northern facades largely retain their 1904 design, preserving original dimensions and decorative elements. In contrast, the southern and eastern facades, absent from archival records, display a more utilitarian aesthetic, emphasizing function over ornamentation. Modern additions, such as fire escape staircases, balance historical authenticity with contemporary safety regulations, allowing the building to meet present-day requirements without compromising its architectural integrity.

Comparative Analysis with Other German Schools

Constructed as a branch of the Galata Bourgeois School (DSA, ŞD. 2732/6: 2), the Haydarpaşa German School exhibits architectural similarities with other contemporary German schools. Given their historical significance and shared mission, a comparative architectural analysis of the Galata Bourgeois School[7], the Haydarpaşa German School, and the Yedikule German School[8] is highly relevant (Fig. 9).

Due to the lack of accessible architectural documentation on the Galata Bourgeois School, a detailed spatial comparison cannot be made. However, as restitution drawings of the Yedikule German School are available, a

years, the school frequently changed locations. In 1897, the newly established School Association prioritized securing a permanent facility, and with the support of the railway company, construction was completed on November 5, 1899 (Mutlu, 2020: 120; Somel, 2021: 64).

Although official reports describe the building as single-story, contemporary photographs and the current structure-now used as Fatih Yunus Emre Middle School-suggest that it was, in fact, a two-story building. Ottoman archival records provide crucial details regarding the acquisition of construction permits and the intended physical features of the structure. Official authorities saw no objections to the school's establishment in this neighborhood, which was surrounded by roads and primarily inhabited by Christian residents.

The Yedikule German School was also included in a 1902 list of 53 German institutions operating within the Ottoman Empire, prepared by the German Embassy and approved by Ottoman officials. In this document, it was registered as *École allemande à Yédi-Koulé*, ranking second on the list (Utkaner, 2009).

FIG. 10 YEDIKULE GERMAN SCHOOL RESTITUTION PLANS (UP) AND FAÇADES (DOWN) DRAWINGS

comprehensive architectural comparison between the Haydarpaşa and Yedikule German Schools is feasible. Thus, the evaluation of the Galata Bourgeois School will be limited to its façade characteristics.

Despite its larger scale, the Galata Bourgeois School shares façade similarities with the Haydarpaşa and Yedikule German Schools. All three buildings reflect the eclectic style that became widespread during the late Ottoman period. Their façades feature a repetitive arrangement of low-arched, rectangular, and molded windows, creating a uniform visual rhythm. The influence of the *École des Beaux-Arts* is evident in the symmetrical façade compositions, horizontal string courses separating the floors, and particularly in the eclectic cornices and eaves of the Haydarpaşa and Yedikule schools. Furthermore, all three schools feature centrally projecting entrance sections, though the Haydarpaşa German School distinguishes itself with a small *loggia* at its entrance.

The floor plans of Haydarpaşa German School and Yedikule (Fig. 10) German School reveal distinct yet complementary spatial approaches that align both schools within the disciplinary city school architectural model prevalent in late 19th-century Germany (Schalz, 2015; Herrmann, Oelkers, 1994). Both schools follow a compact, symmetrical layout centered around a corridor, emphasizing strict discipline, centralized control, and teacher authority through rigid classroom alignments and controlled circulation.

Both schools allocate educational spaces to the ground and first floors, with basements serving as service areas. Haydarpaşa's basement is enclosed and internally focused, consistent with the disciplinary school's emphasis on enclosed, controlled spaces. Conversely, Yedikule's basement establishes slightly stronger outdoor connections, although the general spatial organization remains controlled and hierarchical.

On the ground floor, Haydarpaşa maintains a linear organization, concentrating classrooms along a central axis, reinforcing teacher-centered education and systematic student monitoring. Yedikule, while slightly more expansive, still emphasizes disciplined student circulation through clear spatial separations. The staircase configurations in both schools reflect the hierarchical control typical of city schools (Schalz, 2015).

The first floor at both Haydarpaşa and Yedikule mirrors the ground floor, maintaining uniform corridor-based distributions and reflecting a strict adherence to systematic organization. Their layouts maintain disciplined spatial arrangements with clear separations between classrooms and administrative areas.

In the attic, Haydarpaşa's design remains functional and minimal, maintaining the practical and disciplinary character of city school architecture. Yedikule's attic exhibits a slightly more pronounced architectural character yet still aligns closely with the structured disciplinary model.

In summary, both Haydarpaşa and Yedikule German Schools exemplify structured, enclosed planning characteristics of traditional disciplinary city school models, emphasizing discipline, hierarchy, and controlled spatial organization. Both schools clearly reflect the prevailing architectural and pedagogical trends of their period.

Conclusion

The Haydarpaşa German School exemplifies the intersection of architecture, education, and diplomacy in the late Ottoman period. As a product of Ottoman-German collaboration, it functioned as both an educational institution and a medium for cultural diplomacy. Its architectural organization, following the city school model, reflects the disciplinary ethos of German pedagogical traditions, emphasizing hierarchy, control, and centralized supervision.

A comparative analysis of Haydarpaşa, Yedikule, and Galata Bourgeois Schools suggests that all three institutions adhered to the city school typology, characterized by corridor-based spatial arrangements that structured circulation and reinforced teacher authority. While the Galata Bourgeois School displayed a more monumental design, its core spatial organization remained consistent with that of Yedikule and Haydarpaşa, where order and efficiency were prioritized.

The bureaucratic licensing process of the Haydarpaşa German School highlights the negotiation of cultural sovereignty between the Ottoman state and the German Empire. While Ottoman authorities aimed to regulate foreign schools, European powers leveraged educational institutions to maintain influence. The licensing process and school design reflected broader European architectural trends and strategic efforts to integrate ideological control within education.

Following World War I, political transformations led to the gradual nationalization of foreign schools, with Haydarpaşa eventually becoming part of the Turkish educational system. Its transition to a state-run institution marked a shift from foreign-affiliated education to national integration.

Today, the school stands not only as a preserved architectural heritage site but also as a potential locus of urban memory. As a former space of diplomatic negotiation and ideological assertion, it invites reflection on how built environments may continue to embody traces of their complex historical and political functions. Its presence in the cityscape offers an opportunity to consider the enduring impact of imperial and educational legacies within modern urban contexts. This study underscores how educational institutions serve as sites of cultural negotiation and modernization, offering insights into the role of architecture in shaping ideological and political processes in colonial and post-colonial contexts.

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Abbreviations

DSA: Directorate of State Archives
BEO: Bâb-ı Ali Evrak Odası [Sublime Porte Documents Office]
İ.AZN: İrâde Adliye ve Mezâhib (Azınlıklar) [Imperial Decrees on Minorities]
İ. HUS: İrâde-i Hususiye [Special Imperial Decrees]
İ.DFE: İrâde-i Defter-i Hâkâni [Imperial Decrees from the Ottoman Land Registry Office]
MF.MKT: Maârif Nezaret-i Mektubu Kalemi [Ministry of Education Correspondence Office Documents]
ŞD: Şurâ-yı Devlet [Council of State Documents]
ZB: Zaptiye Nezareti Belgeleri [Gendarmerie Ministry Documents]

Illustration sources

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Fig. 3 Authors

Fig. 4 Goad, C.E. (1906) 'Fonction indéterminée. 51: Constantinople vol. III Kadi-Keui', *Gallica*. Available at: https://gallica.bnf.fr/ark:/12148/btv1b10100575z.r=goad%2c%20charles%20e.%20fonction%20ind%c3%a9termin%c3%a9e?rk=450646;0 [Accessed 18 Nov. 2024].

Fig. 5 Pervititch, J. (1936) 13 Haydarpaşa: Rihtim Mahallesi. Available at: https://gallica.bnf.fr/ark:/12148/btv1b101007263.r=haydarpa%c5%9fa?rk=42918;4 [Accessed: 18 Nov. 2024].

Fig. 6 DSA, İ.AZN. 56/19; Palo, A. (2016) *Osmangazi Primary School Survey, Restitution, and Restoration Report*. Unpublished restoration report, Önde Design Architecture Consultancy Construction Contracting Building Materials Industry and Trade Co. Ltd., Kadıköy/Istanbul.

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Conceptualization: Ç.Ç. and A.K.; methodology: A.K.; validation: A.K. and Ç.Ç.; formal analysis: Ç.Ç.; investigation: Ç.Ç. and A.K.; resources: Ç.Ç. and A.K.; data curation: A.K.; writing – original draft preparation: Ç.Ç. and A.K.; writing – review and editing: A.K.; visualization: Ç.Ç.; supervision: A.K. Both authors have read and agreed to the published version of the manuscript.

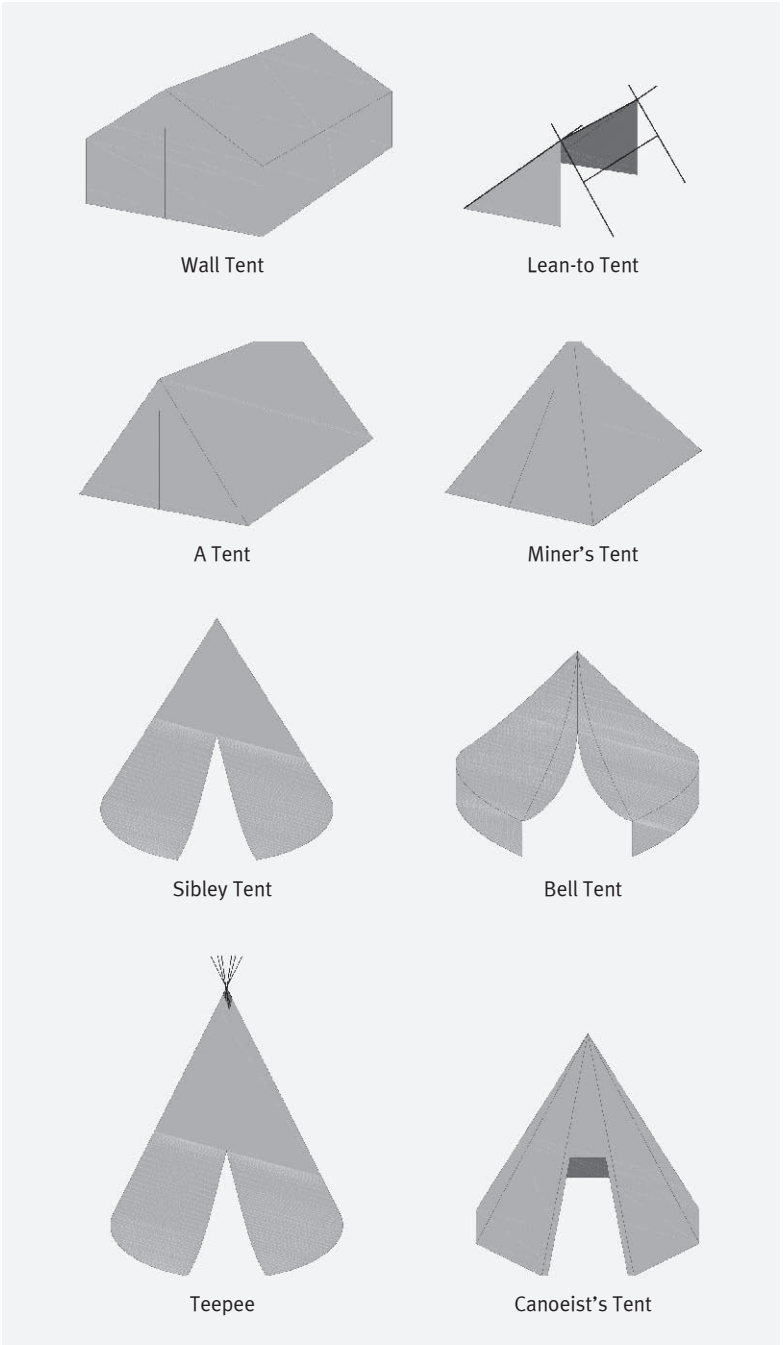

Fig. 1 Most common types of tents in Development period

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Historical Overview of the Development of Temporary Architecture for Tourist Accommodation

ARCHITECTURAL-CONSTRUCTIVE CHARACTERISTICS
PERIODS OF DEVELOPMENT
TEMPORARY ARCHITECTURE
TOURIST ACCOMMODATION

Temporary architecture for tourist accommodation has become increasingly important in sustainable tourism planning, yet it remains underexplored in academic research. This paper aims to define temporary accommodation architecture and identify its stages of development. The focus is on the progress of architectural and structural features of these units in the USA and Great Britain, which are considered pioneers in this sector. The research employs qualitative analysis of literature on temporary tourism architecture and uses comparative methods to examine the evolution over time. As a result, three development phases were identified and analysed in relation to the broader stages of tourism development. The study also highlights significant inconsistency and diversification in the classification of temporary accommodation units. The main contribution of this research is the introduction of a new typological classification system for temporary tourist accommodations, based on their architectural and structural characteristics.

Introduction

Tourism has the potential to threaten its own resources – such as natural environments, spaces, and social fabric – leading international agreements on sustainable development to emphasize the importance of promoting sustainable tourism (United Nations, 2015). In uncertain economic, ecological, and social contexts, flexible temporary architecture within the tourism industry can support sustainable practices (Lucivero, 2012). Temporary architecture covers a broad range of structures and objects, generally defined as systems of varying sizes and functions, including buildings and smaller elements, that emphasize impermanence through the choice of materials, limited lifespan, mobility, and lack of permanent attachment to a specific location (Al-Musawi, Ali, 2025). Closely related is the concept of portable architecture, which refers to structures designed for ease of transport and assembly in distant or different locations from where they were originally created (Kronenburg, 2003: 1). Temporary architecture has more meanings in different circumstances but in the context of this research, temporary architecture for tourist accommodation is defined as the architecture of portable small units for tourist accommodation that are easy to set up and are not permanently connected to the ground. This type of architecture is sometimes installed more permanently, but the term temporary is used because its concept is based on mobility, changeability and a flexible (Lucivero, 2012; Martín et al., 2020), non-invasive approach to nature (Trisno, et al., 2025) as it is easily installed, removed and leaves a minimal footprint, allowing for easy reversibility of the landscape (Tost, 2015; Berizzi, et al., 2021). It is widespread in the form of tents or, more recently, prefabricated solid units of lightweight materials (huts, mobile homes, etc.).[1]

The research area encompasses literature in the fields of camping, temporary architecture, and tourism, although a lack of scientific sources was noted (Garst, et al., 2009; Vreš, Demšar Vreš, 2016). *The Book of Camping and Woodcraft* (Kephart, 1906) is a key manual on camping and camping gear, including tents, representing an important reference from the early pioneering days of camping, *The Art of Camping* (De Abaitua, 2011) and *Heading Out: A History of American Camping* (Young, 2017) interpret the development of camping, with references to the development of camping architecture. The issue of (temporary) integration of camps into the landscape is discussed in the article *Architecture for Informal Tourism – Mild Occupation of Landscape through Campsites* (Tost, 2015) and the relationship between camping and nature in the USA throughout history is analysed in the article *A Short History of the Campsite* (Hogue, 2011). The conference report *Camping and Open-Air Tourism: An Opportunity for Sustainable Tourism in Coastal Areas* (Lucivero, 2012) discusses the benefits of flexible, mobile architecture and its origins. On the other hand, the book *Houses in Motion, the Genesis, History and Development of the Portable Building* (Kronenburg, 1995) deals with the development of portable architecture and systematizes the types according to the construction method. It concludes that portable architecture is not limited to a single use and emphasizes its benefits compared to permanent structures, especially because of its prefabricated design and portability. The core focus of the research is on the evolution of temporary accommodation architecture in tourism, beginning with an overview of the broader history of tourism itself for contextual understanding. The article *Prospects in tourism history: Evolution, state of play and future developments* (Walton, 2009) observes development of tourism and gives a critical review of research on the history of tourism. An overview of theories on the history of tourism in the book *Turizam, Ekonomske osnove i organizacijski sustav* (Čavlek, et al., 2011) points to different approaches to understanding the history of tourism. Newer phenomena in camping tourism, which are also reflected in

architecture, are described in articles *Garden Village Bled glamping as an innovative revitalization of degraded landscape* (Vreš & Demšar Vreš, 2016), *Glamping – New Outdoor Accommodation* (Vrtodušić Hrgović, et al., 2018) and *Trends in Camping and Outdoor Hospitality – An International Review* (Brooker & Joppe, 2013).

The temporary architecture for accommodation in tourism is viewed as a secondary topic in the literature on camping or temporary architecture, so its architectural-constructive characteristics have not been sufficiently researched. The article aims to contribute to the research of this growing type of architecture for tourism by analysing the development of its architectural-constructive characteristics.

The research has two goals:

– To determine the periods of the development of temporary architecture of accommodation in tourism and to place them in relation to the periods of tourism development by comparing whether the same or similar events triggered developmental leaps in temporary tourist accommodation as well as in tourism in general.

– To determine the types (typologically classify) of temporary accommodation architecture in tourism according to architectural-constructional characteristics, and in relation to particular periods.

Periods of Tourism and Development of Temporary Architecture for Tourist Accommodation

There are various divisions of the historical periods of tourism depending on how tourism theorists recognize them. Some associate the beginning of tourism with antiquity (Goeldner, Ritchie, Mcintosh, 2000; Gartner, 1996 cited in Čavlek, et al., 2011: 41), others with industrial civilization (Enzenberger, Freyer, 1998 cited in Čavlek, et al., 2011: 41). The third group identifies two key periods in the history of tourism: the era of the privileged classes – such as antiquity's spa tourism and medieval pilgrimages – and the era of modern tourism (Marković, Marković, 1970, cited in Čavlek et al., 2011: 41). Most scholars regard the Grand Tour, spanning from the 16th to the mid-19th century, as a precursor to modern tourism (Walton, 2009). The emergence of tourism was facilitated by the development of all relevant factors – initiative, reception, and intermediaries – during the mid-19th century (Cicvarić, 1984, cited in Čavlek et al., 2011: 42), when broader segments of society began participating in travel, marking what is considered its true inception. Burkat and Medlik talk about tourism in terms of technological development and means of travel, identifying the periods before the Industrial Revolution until 1840, followed by the period until 1914 characterized by railways and steamships, and then the development of travel by car and airplane (Burkat, Medlik, 1974, cited in Čavlek, et al., 2011: 43). Freyer observes the stages of development according to the development of means of transport, the motive of travel and the number of participants. He does not consider the pre-stage (up to 1850) as real tourism and divides the stages as follows: the initial stage (1850-1914, train, steamboat), the development stage (1914-1945, train, car, bus, plane) and the high stage from 1945 (car, plane) (Freyer, 1998, cited in Čavlek, et al., 2011: 43). In theories of systematization of tourism, the last phase, after World War II, could be further divided (Čavlek, et al., 2011, p. 43). The book *Naselja, gradovi, prostori* contributes to this approach where Marinović-Uzelac divides the history of tourism into antetourism from antiquity till the *Grand Tour*, paleotourism from 19th century till the end of World War II, a period of enhancement of transport, neotourism, the time of the strengthening of the middle class and the emergence of mass tourism, and from the 1990s metatourism, a further increase but also the development of specialized and sustainable tourism as a reaction to mass tourism (Marinović-Uzelac, 1986, cited in Mrđa, 2015).

Every development implies certain changes, so certain events determine periods of tourism (Čavlek, et al., 2011, p. 43), which can also be applied to periods of development of temporary architecture for accommodation in tourism. This research determined the periods of development of temporary architecture for tourist accommodation, focusing particularly on the USA and Great Britain, where tourist camping was invented, and the development was most significant. Its progression was explored through relevant literature, which highlighted changes in temporary architecture for tourist accommodation by examining the architectural and structural features of the individual units.[2] The main sources of research are the literature specialized in the research topic, the analysis of applied

1 Specific types of touristic accommodation similar to temporary architecture are travel trailers (campers, caravans), recreational vehicles (RVs), boats and houseboats (floating homes), but in this research they are considered vehicles or floating structures, not temporary architecture.

2 Architectural-constructive characteristics of the unit refer to the shape and size, spatial concept and facilities, materials, construction and installation method.

Table I Chronological display of the production of units partially or completely made of solid materials

Units			Start of production	Manufacturer
Units made of canvas materials	Units partially made of solid materials	Units completely made of solid materials		
		lodge, pod	1960s	*Pathfinder homes*
tent			1970s	Bushtec Adventure
	yurt		1978	Pacific Yurts
		camping pod	1989	*Wigwamholidays*
tipi, tent	yurt		1990s	Secret Creek
		tent	1990s	Tentickle
		pod, cabin	2002	Camping Cabins
		pod, cabin	2001	Logcabins.lv
	safari tent		2009	Outstanding
	safari tent		2009	*Under Canvas*[3]

Table II Periods of historical development of temporary architecture of tourist accommodation

Periods of temporary architecture for tourist accommodation development	Beginning of Historical period	Changes that prompted the development
Development period	1840s	Beginning of tourist trips to nature; improvement of camping gear, roads and transportation
Modern period	1960s	Introduction of modern materials (metal, nylon) instead of traditional ones (wood, cotton); appearance of dome tents
Postmodern period	1990s	The rise in popularity of solid and partially solid units; the emergence of glamping

units in camps through relevant camping associations and specialized tourist portals, and the study of the development of units by major manufacturers, primarily in the USA and Great Britain. Secondary research sources are literature on temporary architecture and tourism.

Determination of Periods of Historical Development of Temporary Architecture for Tourist Accommodation

The previously mentioned theorists generally regard the mid-19th century as the point when modern tourism truly began. Before the 19th century, tourism was rare and primarily focused on visiting specific destinations such as spas or religious sanctuaries, rather than experiencing nature. As a result, the earlier development of temporary architecture for tourist accommodation was minimal and mainly consisted of improvised shelters or simple tents used for overnight stays along travel routes. Consequently, the history of temporary architecture for tourist accommodation is typically considered to have started in the 19th century, mainly in the USA and Great Britain, when nature began to be viewed not only as an economic resource but also as a space for leisure and recreation[4]. Traveling to nature in the USA started before the 1840s, particularly to Adirondacks Mountains. After the American Civil War, camping grew in popularity.[5]

The improvement of camping gear, roads and transportation made camping more accessible[6] and at the turn of the century the number of campers grew rapidly (Young, 2017, p. 75). They camped freely, unorganized and without infrastructure anywhere in nature (Hogue, 2011) and began to devastate the environment, especially with cars. Endangering nature raised awareness of nature protection[7], so camping began to be regulated, and the first organized camps were established.[8] The demand for temporary architecture for tourist accommodation increased, so different types of tents were developed. Further development followed with the rise in standards and leisure time of the middle class after World War II[9], when the period of greatest growth of camping tourism began.[10] This period of early development of camping itself and various types of tents with wooden construction can be called the **development period**.

The 1960s mark the period of the greatest progress in tent development and can be called the **modern period**. The wooden construction of the tent was replaced by a light metal construction and the cotton canvas by lighter and more practical nylon materials. The emergence of rounded structures in the design of tents was a turning point in the approach and soon many variations of tent shapes appeared. These improvements sig-

3 (Dusek, 2017)

4 Art critic John Ruskin was one of the most influential promotors of nature-loving. His book *Modern Painters* of 1843 praised nature and prompted English tourists to visit France, Italy, and Switzerland (Young, 2017, p. 5).

5 A decisive influence on the popularization of camping was the book *Adventures in the Wilderness; or Camp-Life in the Adirondacks* by Boston pastor William H.H. Murray from 1869. After the book's release, the Adirondack region was transformed by many visitors. This stampede was called the *Murray Rush* (Young, 2017, p. 27).

6 The invention of modern bicycle in 1885 improved the accessibility of the countryside (De Abaitua, 2011, p. 34). The British Thomas Hiram Holding was a pioneer of cycle camping and is considered the founder of modern camping. The appearance of cars, especially the affordable Ford-T models in 1908 and then in 1916, gave further momentum to the development of camping (Young, 2017, p. 94).

7 In the 1920's the botanist Emilio P. Meinecke analysed the tourist devastation of nature and prepared the first environmental protection programs. These included a ban on camping outside the campgrounds and the control of pedestrian and car traffic within nature parks, which led to a reduction in devastation. Many campgrounds in the US and abroad have been designed according to his recommendations (Young, 2017, pp. 158, 168).

nificantly facilitated the transport and construction of accommodation units.

In the last quarter of the 20th century new types of temporary accommodation units emerged, partially or completely made of solid elements (Table I). These types were also used in previous periods, but research on the history of production from bigger manufacturers (mainly in Great Britain and the USA) showed that wider use began in the 1990s and increased towards the end of the century.

The use of solid elements significantly changed tourism and design, so it can be considered that **postmodern period** began in the 1990s and continues to this day, developing in the 21st century in several directions. The mainstream of temporary architecture accommodation units in tourism becomes more widespread, providing increasing levels of comfort (Brooker & Joppe, 2013; Vrtodušić Hrgović, et al., 2018) in highly dense and more urbanised camps with a growing share of solid units.[11] Due to mass camping saturation, new trends of camping tourism emerge: c*lassic* or *cool camping*, return to simple camping, oriented towards minimalism in simple tents (Sladoljev & Pilar, 2019, p. 119) and *glamping,* a type of tourism in mainly luxury and unusual accommodation in natural environment (Vreš & Demšar Vreš, 2016; Vrtodušić Hrgović, et al., 2018) which become more popular. The term *glamping* (blend of glamour or glamorous and camping (Merriam-Webster, n.d.) begun to be widely spread in the United Kingdom and Ireland in 2004 (Vrtodušić Hrgović, et al., 2018), although such type of tourism is not new.[12] It can be concluded (Table II) that the history of temporary accommodation architecture in tourism began in the development period with modest improvised tents and shelters and innovative types of tents. The modern period introduced new materials and forms that improved this type of accommodation. In the postmodern period, a pluralism of types, forms, materials and directions of development emerged, and its beginning was the appearance of a wider use of partially or completely solid accommodation units.

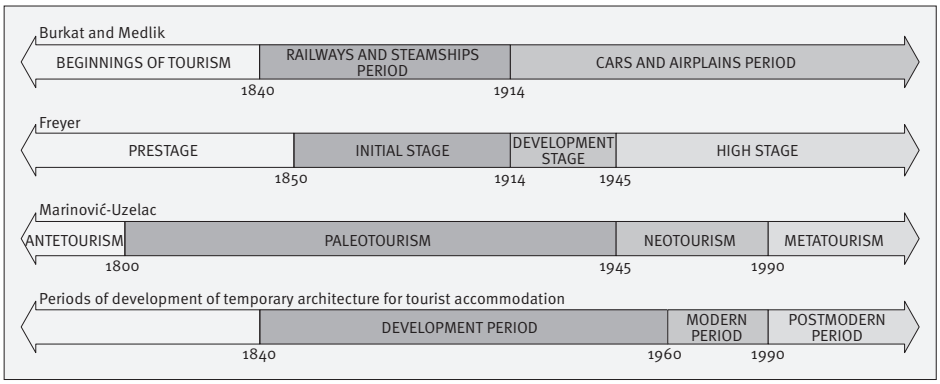


Fig. 2 Comparison of the timelines of tourism development and temporary architecture for tourism accommodation

By comparing the evolution of temporary accommodation architecture in tourism with the mentioned theoretical divisions that place the emergence of true tourism in the 19th century, certain similarities can be noted. The divisions of tourism development partly coincide with the periods of development of temporary accommodation architecture in tourism, and the points of change in both are mainly related to technological progress (transport, construction and materials) and socio-economic changes (wars, economic development; Fig. 2).

Architectural-Constructive Characteristics of Temporary Architecture in Development Period

First temporary architecture for tourist accommodation was often home-made tents, fixed with ropes attached to pegs in the ground or improvised wooden shelters of branches and wooden stakes driven into the ground. Towards the end of 19th century, manufacturers began to develop improved versions of tents and equipment (Young, 2017, p. 77). Many types of traditional tents had been developed before throughout history all over the world, but Horace Kephart, an American travel writer identified seven categories of tents in 1906 (wall, lean-to, A, miner's, Sibley, teepee and canoeist's). A *wall tent*, also known as *safari tent*, has four

8 The first organized campgrounds in the USA were clearings marked for camping (Hogue, 2011). In order to protect the environment, in the 1920s experts started to plan and design campgrounds. Among the first were landscape architects Arthur Carhart and Frank H. Culley (Young, 2017, p. 136).

9 The surplus of military equipment on the market after the war contributed to the popularity of camping.

10 Camping was also developing in other parts of the world. For example, in Europe, by the end of the 1950s, laws on camping were passed in Italy, Belgium, Luxembourg, Portugal, France and Croatia (Bjazić Klarin & Kranjčević, 2023).

11 According to *The 2023 North American Camping & Outdoor Hospitality Report* sponsored by *Kampgrounds of America, Inc.*, in 2018 there were 38,808,000 camping households in the U.S. and Canada, of which 16.1% in cabins (solid units), 59.6% in tents (canvas units) and 24.3% in RVs. In 2022, the number of camping households grew to 57,885,300, of which 21.2% in cabins, 52.5% in tents and 26.3% in RVs. The above data shows a significant absolute increase in camping households, but also an increase in the relative share of solid units in the total number of camping households (Cairn Consulting, 2023).

12 African safaris with luxury tents of the 1920s were a predecessor of today's glamping (Vrtodušic Hrgović, et al., 2018). This type of tourism has been present in France since the 1990s, but is becoming recognized in the 2000s (Brooker & Joppe, 2013).

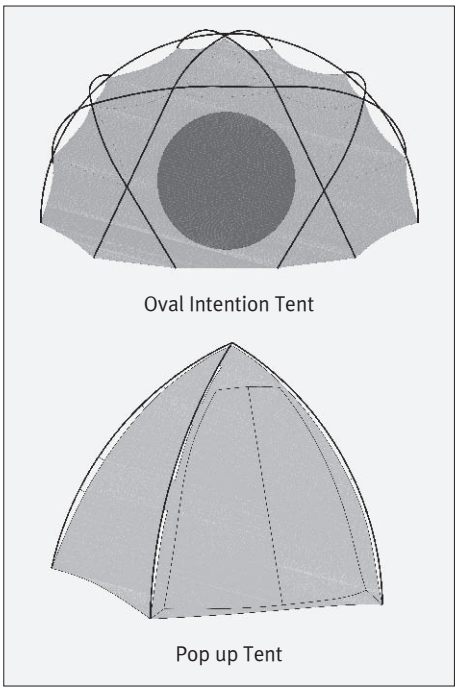


Fig. 3 Characteristic new types of tents in Modern period

vertical walls and a gable canvas roof. Frame construction may be internal or external. It provides more room and is suitable as an all-season tent and can accommodate a stove. It is preferred for a fixed camp, but on travel, often a more portable shelter is required. *A lean-to tent* was favoured by guides, and others who live in the woods. It has a sloping back side, two side vertical sides and a fourth side open to the campfire. Heat from the fire reflects off the tent roof onto the ground, keeping it warm. For easy portability and easy set-up for summer travel, Kephart recommends an *A tent* with two sloping roof surfaces and two triangular vertical walls at the back and front. In this case, no poles are used, but the tent is stretched between two trees using a strap. A *teepee* is originally a cone-shaped Native American tent with a hole in the roof, making it the only tent that can be heated by an open fire inside. Teepee (also called *tipi*) is the most comfortable, storm proof, portable home for all regions and weather conditions (Kephart, 1906, p. 44). The base of a tepee structure usually consists of a conical frame of 3 or 4 poles to which 20 to 30 lighter poles are added, inclined towards a central point and connected near the top. The adjustable smoke flap was left open at the top, and the flap at the bottom was a door opening (Britannica, n.d.). Pyramidal *miner's* and conical *Sibley* tents have only a pole in the middle and a steep slope that drains rain well, so they can be made of thinner canvas (Kephart, 1906, p. 44). A miner's tent covers a square ground and provides more space than a conical tent. The Sibley tent was developed in 1855 by American army officer Henry Hopkins Sibley, based on the teepee, but using canvas instead of buffalo hide and a pole in the centre. The *bell* tent[13], similar to the Sibley tent, but with side walls and guy lines, was also often in use (Bell Tent UK, n.d.). A very functional form of tent for all-round service is octagonal *Canoeist's* tent[14] invented by J.E.G. Yalden (Fig. 1).

Tents were the predominant type of temporary architecture for accommodation, however, other types were also developed. In 1919, John W. Gregg developed one of the first campground designs for Marysville, California, where he incorporated innovation – individualized camping sites with little wooden houses (Young, 2017, p. 133). In Great Britain, one of the pioneers of temporary solid units is Sir William Butlin, who opened the first Holiday Camp in Skegness in 1936. In the camp, there were one-room huts with timber frame, asbestos panels and gable roof with overhanging eave (Historic England, n.d.).

Architectural-Constructive Characteristics of Temporary Architecture in Modern Period

Common modern tents can be divided by design into single-pole tent with one pole, ridge tent with at least two poles, frame tent with steep walls, shallow roofs and self-standing frame, dome tent in the form of a hemisphere, pyramid tent, hoop tent where one pole at least is a hoop, single-hoop tent with a single pole in the form of a loop, tunnel tent with parallel hoops, geodesic tent with at least three flexible poles which cross over to form triangles and inflatable tent made of inflatable tubes (Ayakta & HZ, 2018).

Some of these types were used before the Modern period, but the dome tent was a shift from the tent design which remained unchanged since the American Civil War.[15] Mankind has long exploited the aerodynamic superiority of rounded structures: the teepee is an asymmetrical cone, and the *Mongolian yurt* is a round tent with a conical roof. The use of a dome shape optimizes the maximum amount of space with the minimum amount of material, an advantage for the tent as it results in more volume for less weight. Bill Moss and Henry Stribley patented the dome-shaped *Pop-up tent* (Fig. 3) in 1955 (also known as *The Pop tent*) two years before Buckminster Fuller's *Geodesic tent* was patented. Both structures are domed, but very different. *Geodesic tent* was a spherical tent suspended within a geodesic frame by numerous conical supports. It is the strongest type of dome, in which the load is distributed in all directions throughout the entire structure. On the other hand, the *Pop tent* consisted of flexible, lightweight, fiberglass poles that locked into a central hub at the apex of the tent. The advantage of the *Pop-up tent* is that it was quick and easy to set up (De Abaitua, 2011, pp. 239 – 245). Soon, a number of tents of different shapes and materials appeared on the market. In 1960, the American company Eureka!'s developed a quick-set

13 The Bell Tent design was first started to be used by European militaries in 9th Century, and the design was in regular service with the British Army by the Crimean War (1853-1856) (Bell Tent UK, n.d.). In general, throughout history, armies in Europe and around the world have widely used tents in military campaigns.

14 In his book *Canoe Cruising and Camping*, canoeist Perry D. Fraizer singles it out as his favourite tent (Kephart, 1906, p. 45).

15 However, dome tents were known before. English officer Godfrey Rhodes in the Crimean War in 1854 designed it based on the model of circular Ottoman military tents. At the beginning of the 20th century, explorer Frank Herman Gotsche, inspired by the igloo, designed the *VXL tent* for polar expeditions, and in 1914, explorers Ernest Shackelton and George Marston designed a dome tent for Antarctica (De Abaitua, 2011, p. 248).

Draw-Tite® tent, with a practical free-standing external frame, and Jack Stephenson and his company *Warmlite* in 1961 produced *Elliptical Arc*, an extremely strong, lightweight tunnel tent. In 1972, Skip Yowell designed the *Trail Dome*, a tent with an outside aluminium construction and polyester walls. Mark Erickson and Bob Gillis of the *North Face* in 1975 introduced the *Oval Intention tent* (Fig. 3), a geodesic dome with an outside construction (De Abaitua, 2011, p. 256).

Except for the mentioned examples from Marysville and Skegness in early 20th century, no data was found about the wider use of solid units for temporary architecture for tourist accommodation before the last quarter of the century.[16]

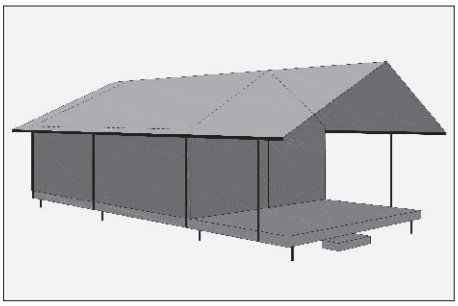
Architectural-Constructive Characteristics of Temporary Architecture in Postmodern Period

Since the late 20th century, tents have been made from even lighter, stronger and more elastic materials (Trisno, et al., 2025), albeit without any significant changes after the modern period, but the use of partially solid and solid units increased. New types were assembled at the campsite or as fully equipped ready-made units brought from the factory and placed on the campsite. Partially solid units resemble tents because of the canvas envelope but contain solid surfaces. The most common partially solid units are bell tent, safari tent, yurt or geodesic dome with a wooden floor platform supported on short wooden or metal poles driven into the ground or small concrete foundations, sometimes with solid inner walls (Fig. 4).

Solid units are made entirely of solid materials of various shapes and can be found in various materials (wood, steel, plastic etc.) and forms (huts, pods, containers, tree houses etc.; Fig. 5).

In this period, the term glamping units is also used, which are usually partially solid or solid units.[17] Such types often offer luxury that includes kitchens and bathrooms, so staying in them is often more like staying in house than camping. The use of bathrooms and kitchens in temporary units, which was a rarity before 21st century, results in the construction of a more complex infrastructure in camps (Garst, et al., 2009). Due to their more complicated set-up, sometimes including infrastructure, the units are not suitable for owning and setting up personally but are rented by the guest in the camp as previously set up (Brooker & Joppe, 2013). The basic principle of assembling such units is like previous ordinary tents, but technologies and materials are developing.[18] In some units, the share of solid elements increases, primarily for inner walls where bathrooms, kitchen elements and installations are placed. Floors and walls are made of a light wooden and metal structure covered with prefabricated wooden, plastic, composite or similar panels. Direct contact with nature becomes a growing trend in camping (Garst, et al., 2009), so units are sometimes placed in unusual ways on the ground, water or trees, which may require innovative constructions. An important element of a glamping unit is the terrace as an extension of the unit's floor platform. The units are usually carefully placed in the environment to preserve the natural ambience, so the platforms are made of light prefabricated structures. It is also common to use cables and special ways of non-invasively supporting the platform on the ground (thin steel rods stuck in the ground) which are easy to remove and thus return the campsite to original state. However, the term glamping is not clearly defined and for marketing reasons is used very widely and indiscriminately – from mobile homes densely arranged in rows in classic camps to exclusive and unique forms of accommodation in the wilderness. Units with a roof made of tensile fabric modelled on a bedouin tent supported by poles and tightened with ropes are also being developed. Underneath the tensioned canvas can be a partially solid or solid unit (Fig. 6).

Mobile home also known as a house trailer, park home, trailer or trailer home is a subtype of solid units. Mobile homes are generally larger than other solid units but still adapted to road transport since they are completely manufactured in factory, and brought or towed fully equipped, placed on the ground and connected to the infrastructure. With its equipment and appearance, they are similar to permanent houses and have more rooms, a kitchen, a bathroom, etc. It is usually an insulated metal construction clad in steel panels, PVC, timber or composite materials. This form of solid units goes back to the early years of cars and motorized



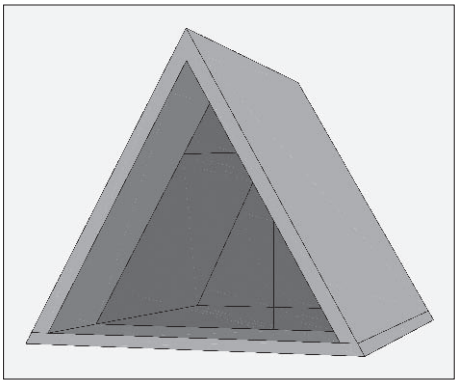


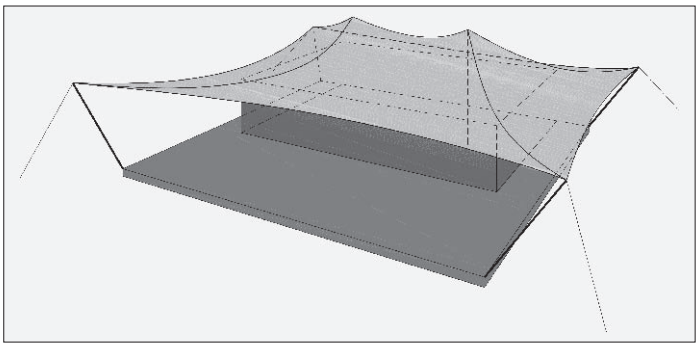
Fig. 4 Safari tent with canvas envelope, solid platform and solid inner walls

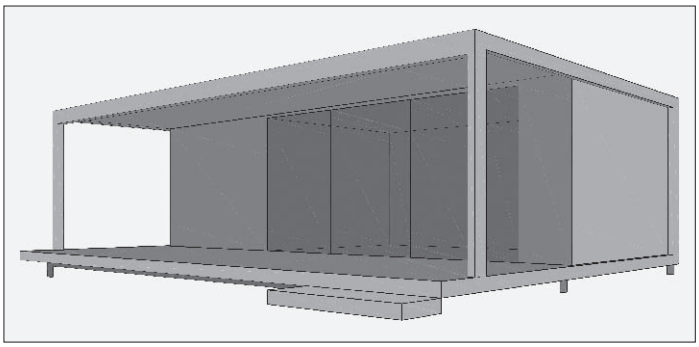
Fig. 5 Solid unit

16 However, this type of architecture is being considered. In 1935, in France, L'Architecture d'Aujourd'hui announced a competition to design a lightweight, portable housing unit, inexpensive and made of recyclable parts, that could accommodate a family and be placed in any location (Lucivero, 2012).

17 Glamping is often oriented towards luxury, so the units can also have hot tubs and saunas.

18 Some modern safari tents come to the campsite as a box on a truck. The box is placed in the planned position on small foundations, and the sides of the box are unfolded into a horizontal surface and become a solid floor with fully equipped sanitary facilities in the middle with solid inner walls. The tent canvas with substructure is mounted over the entire assembly.





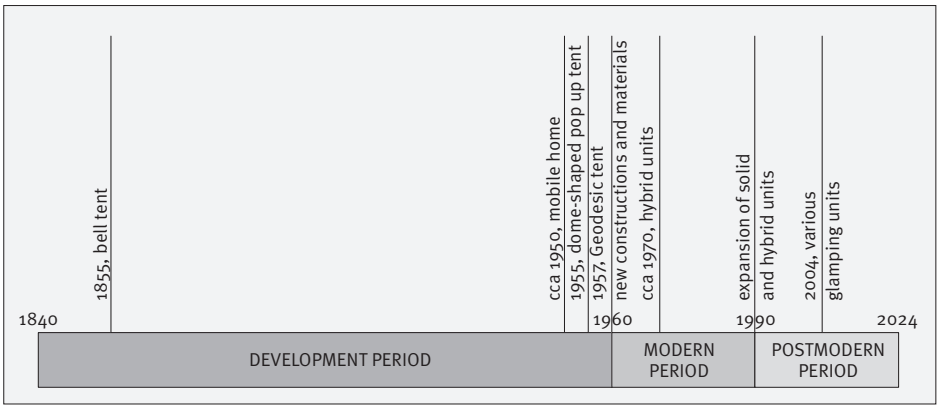


Fig. 6 Unit with tensile fabric roof

Fig. 7 Mobile home solid unit

Fig. 8 Timeline of the development of temporary architecture for tourist accommodation

highway travel. It was derived from the travel trailer, a small unit with wheels often used for camping, which first appeared in England by 1906, and soon in the USA (Young, 2017, p. 212). In the USA, mobile home units were marketed to people whose lifestyle required mobility. However, in the 1950s, they were marketed primarily as an inexpensive form of housing, designed to be set up and left in a location for long periods (Trabattoni, 2024, p. 9), but over time they began to be used for tourism, especially in Great Britain (Fig. 7).

Tents were used for various purposes before tourism (military campaigns, nomadic, trade and research trips, fairs, hunting). Thanks to this heritage and the simplicity of construction, from the beginning of camping tourism, tents were the dominant type of accommodation, and the increase in the use of solid units occurred at the end of the 20th century with changing trends, increasing luxury and attracting more diverse types of tourists. Figure 8 shows the sequence of development of accommodation units and the emergence of certain types of units.

Typological Classification of Temporary Accommodation Architecture in Tourism

There are different typological classifications of temporary architecture for tourist accommodation found in literature (Kronenburg, 1995; Twose & Perkins, 2015). By observing numerous types of units, diversity and overlap in type classifications have been identified. Research from different sources used for this paper shows that the units differ in a variety of characteristics (shape, construction, material, installation method, size, etc.), but that according to architectural-constructive characteristics, a typological systematization can be established derived from architectural factors (type of unit envelope) and constructive factors (construction) into **canvas units, hybrid units and solid units**.

A canvas unit is a type of temporary tourist accommodation architecture predominantly made of canvas, most often with a substructure of linear or curved elements (rods, sticks, arches). Hybrid unit has canvas envelope, but also contains solid flat elements (floor platform, inner walls). Solid unit is predominantly made of solid elements (horizontal, vertical, inclined, curved) with or without substructure.

According to the established typological classification, canvas units are various types of tents, tensile units, pneumatic units, yurts (Mongolian circular tent), teepees (Indian tent) etc. Hybrid units can be tents, yurts, geodesic domes etc. with solid floors and sometimes with a bathroom with solid walls inside the tent. Solid units can be cabins, pods, huts, lodges, mobile houses etc. (Table III).

Conclusion

The development of the observed type of tourism is accompanied by the development of temporary architecture of tourist accommodation, driven by innovations and the emergence of new types of units, which is expected since architecture follows the needs of society.

The development of the units was observed through their architectural and constructive characteristics during the defined periods. No significant change in the size of the units has

Table III Typological classifications of units from different sources systemized into 3 basic types: canvas units, hybrid units and solid units

Source from literature	Canvas units	Hybrid units	Solid units
Houses in Motion: The Genesis, History and Development of the Portable Building[19]	Tensile unit Pneumatic unit	Flat pack unit	Combined system Module
On the Edge Glamping: Design investigations in the New Zealand Landscape[20]	Tent (luxury / safari / tepee / yurt)		Pods (domes/eco pods) Nature space (tree house / igloo / cave / on water)
Croatian Camping Association	Tent	Glamping tent	Mobile house Glamping house
worldofglamping.com[21]	Tree houses (tent / other) Wild stays without ensuite bathroom (tipi / bell tent / pod / other glamping)	Tent structure with ensuite bathroom (luxury and boutique / safari / yurt / domes, bubbles)	Lodges and villas (safari lodge / tented villa / cottages villas in nature / overwater villas and bungalows / luxury huts
glamping.com	Tent	Tent Yurt	Cabin Hut and cottage Treehouse Unique and unusual
Rulebook on the classification and categorization of catering establishments from the group of camps[22]	Tent	Glamping equipment	Glamping house Mobile house
Tourist Camping Law, Croatia 1955[23]	Tent		Other temporary facilities
Camping and Open-Air Tourism: An Opportunity for Sustainable Tourism in Coastal Areas[24]	Tent		Mobile home

Table IV Predominant types of units according to periods of development

	Development Period 1840-1960	Modern Period 1960-1990	Postmodern Period 1990-
Types	canvas units (home-made and various manufactured tents) / *in situ* made shelters	canvas units (various manufactured tents, dome tents) / solid units (mobile home)	canvas units (various manufactured tents, dome tents) / hybrid units (glamping tents, Geodesic domes etc.) / solid units (various types, mobile home)

been noticed, except for the appearance of the mobile home, which is a specific subtype of solid unit originally intended for permanent housing. Regarding the spatial concept, facilities and equipment, canvas units of modern period retain the characteristics of their ancient predecessors, and their development is manifested in improvement of materials, construction and installation method. It can be concluded that the main difference from the first modest units of the development period to the modern luxury units of the postmodern period is wider application of hybrid and solid units, often with kitchens and sanitary facilities, which changed the direction of development by attracting tourists unaccustomed to ascetic camping (Table IV).

In the postmodern period these types have significant growth in absolute numbers and relative proportions compared to canvas units. The new direction changed the paradigm of camping, which arose from attraction to nature and escape from city life in the development period, to imitation of the city life in the postmodern period. Mass camping in the modern period and the need for an increasingly extensive infrastructure of camps and the units in the postmodern period has led to the question of what kind of nature tourism awaits in the future.

This research defined the temporary architecture of accommodation in tourism, periods of its development and typological classification according to architectural-constructive characteristics. In the following research, the development of the relationship between the units of temporary architecture of accommodation in tourism and landscape should be explored. This architecture is marked by its reversibility and harmony with natural surroundings; thus, future research should examine the connection between temporary tourist accommodation units and their landscapes, along with the criteria for their placement. It is likely that this type of tourism will increasingly prioritize higher comfort levels, resulting in greater popularity. However, as mass and urbanized camping reach saturation, new trends are emerging that emphasize a closer relationship with nature. Therefore, the sustainable development of this tourism form should emphasize careful construction and the conservation of natural landscapes.

19 (Kronenburg, 1995, p. 8)

20 (Twose & Perkins, 2015, pp. 18-19)

21 The World of Glamping platform rebranded as Authentic Luxury in 2023.

22 (Republic of Croatia, Ministry of Tourism, 54/2016; 68/2019; 120/2019)

23 (Bjažić Klarin & Kranjčević, 2023)

24 (Lucivero, 2012)

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Illustration source

Figs. 1-8 Authors

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Fig. 1 Split's ring road with urban subcenters and architectural developments for the VIII Mediterranean Games: 1. The City Stadium (home stadium of 'HNK Hajduk Split' from 1979), and 2. the Swimming-pools in Poljud, 3. 'RNK Split' Stadium in the SKOJ Park (reconstruction and extension, remained unfinished), 4. Socialist Youth Center (remained unfinished) and RTV Center in Bol, 5. Sports Center 'Gripe' (reconstruction and extension with the Main Sports Hall), and Shopping Center 'Koteks' in Gripe (completed immediately after MIS), 6. Tennis Center in Firule-Zenta (reconstruction and extension), 7. Hotel 'Marjan' (extension), 8. Croatian National Theater (reconstruction and extension), 9. Maritime Passenger Terminal (reconstruction). The solid black line represents the ring road with Marjan tunnel as the dashed line.

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Split's Ring Road

Realizing Infrastructures for the VIII Mediterranean Games in 1979

ring road
Split, Croatia
urban infrastructure
urban planning
VIII Mediterranean Games

The VIII Mediterranean Games held in Split (Croatia, then Yugoslavia) in 1979 presented a transformative moment, catalyzing the implementation of long-envisioned urban plans through the completion of Split's ring road. Within three years, this infrastructural backbone's final development reshaped the city by connecting emerging subcenters of sports and other public programs with existing ones while linking Split's southeastern and southwestern coastlines into a continuous system. The ring road facilitated the polycentric development conceptualized since the 1950s, integrating protective green zones with the subcenters, while addressing critical traffic challenges. This article examines the institutional framework that enabled this ambitious project, led by the Urban Planning Institute of Dalmatia – Split, and analyzes how the implementation bridged multiple scales from architectural to infrastructural vision. The ring road represents a uniquely contextual implementation of post-WWII urban plans, responding to Split's particular topography and landscape while demonstrating how a mega-event provided momentum to realize comprehensive urban transformation with lasting impact on the city's spatial organization.

Introduction

The VIII Mediterranean Games[1] held in Split in 1979 (*Mediteranske igre Split*, MIS) were a transformative event for the city, marking a period of significant architectural and infrastructural development and a pivotal moment in its modern history. The preparation for MIS evolved into an unprecedented urban renewal campaign that fundamentally reshaped Split's infrastructure, cityscape, and identity, accelerating implementation of planning concepts developed over three decades of post-WWII modernization. At the heart of this transformation was the completion of Split's ring road – a carefully conceived urban armature that served as much more than a mere traffic solution. This infrastructural backbone became the critical link that redefined the city's spatial and functional layout, interconnecting previously separated parts of the city into a cohesive urban system. By linking Split's coastlines and threading together emerging and existing urban areas, the ring road facilitated urban connectivity that had been envisioned, yet unrealized, in Split's urban planning documents since 1951.

The ring road's significance extends beyond its functional role in traffic management. It catalysed Split's evolution from a centralized urban model toward a network of interconnected activity nodes. By weaving together newly developed sports and recreational zones with the existing urban fabric, the ring road created continuity between previously disparate areas of the city. It connected both upgraded existing facilities and new public programs built specifically for MIS – including sports stadiums, swimming-pools, cultural centres and shopping centres – while integrating these developments with established city districts (Fig. 1). Completing this system within the remarkably compressed timeframe of less than three years, as part of a cohesive urban vision, represents a distinctive achievement in late socialist[2] Yugoslavia's architectural and urban planning history. Unlike many urban planning initiatives of the era that remained theoretical or were only partially realized, the urgency and prestige of the Mediterranean Games created the political will and financial resources necessary to fully execute this comprehensive vision. The Urban Planning Institute of Dalmatia – Split (*Urbanistički zavod Dalmacije – Split*, URBS)[3], as the key planning institution, marshalled technical expertise and coordinated multiple scales of intervention – from infrastructural systems to architectural details – resulting in a successful integration of transportation infrastructure with the surrounding urban context.

What makes the ring road especially notable is its ability to go beyond the usual infrastructural projects of its era. Rather than imposing standardized solutions, it responds sensitively to Split's unique topography, existing urban patterns, and cultural context. The road's implementation reflects a sophisticated understanding of how infrastructure can serve multiple functions: facilitating mobility, defining public spaces, structuring urban growth, and creating new civic identity. Today, driving along the ring road offers an experiential journey through Split's modernist architectural achievements – a living exhibition of the city's architectural identity that continues to influence how residents and visitors alike experience the city. This article examines the planning, realization, and impact of Split's ring road within its specific historical, social, and urban context. While existing scholarship has documented individual aspects of Split's development during this period – from Tušek's (1996) catalogue of architectural competitions to Markovina's (2018) historical contextualization – this study offers the first structured analysis of the ring road as an integrated urban system. The research methodology combines archival investigation of original planning documents, morphological analysis of urban transformations, examination of institutional frameworks, and assessment of the infrastructure's relationship to both designed facilities and existing urban fabric. Rather than attempting a comprehensive reconstruction of

each developmental phase, which would extend beyond available archival resources, this article focuses on the ring road's project methodology and its lasting impact on Split's spatial organization and identity, illuminating how a mega-event opportunity was leveraged to realize a more ambitious vision of urban modernization.

Split's Urban Transformation and Modernization through MIS

After World War II, Split underwent significant change in its urban landscape, influenced by socialist principles and modernization.[4] Urban planning during this period emphasized industrial growth, housing for rapidly growing cities, and infrastructure development. The urban development of Split at that time was regulated through several major documents and plans, which then became the basis for a number of detailed plans. The major regulative base was laid out by the Directive Regulatory Plan of Split (*Direktivna regulaciona osnova grada Splita*) from 1951, Studies for the General Urban Plan of Split (*Studije generalnog urbanističkog plana Splita*) developed between 1957-1961, Decision replacing Split's urban plan and its coastal area (*Odluka koja zamjenjuje urbanistički plan Splita i obalnog područja*) from 1968, Project Split Peninsula – a program proposal for the executive urban plan (*Projekt splitski poluotok – prijedlog programa za provedbeni urbanistički plan*) from 1975, and the General Urban Plan of Split (*Generalni urbanistički plan Splita*, GUP) from 1978 (Grgić, 2011). The primary problem the city faced were housing shortages due to widespread wartime destruction. Throughout the late 1940s and 1950s, industrialization and internal migration to Split intensified, and while industrial plants were developing, housing construction lagged behind (Klempić, 2004). By 1957, the crisis peaked: with around 81,000 residents and only 16,000 apartments (8.8 m^2 per person), Split needed at least 6,000 more units (Muljačić, 1969). Urban authorities responded by forming Split Management Bureau (*Zavod za gospodarenje gradom Splitom*), later evolving into Split Development Enterprise (*Poduzeće za izgradnju Splita*, PIS), a municipal housing company. Most new flats were purchased by state enterprises for their employees or reserved for Yugoslav Army members. Efforts focused on building "economical apartments" like the E-57 model – small, low-cost units. Between 1958 and 1962, hundreds were built using URBS standardized designs (Klempić, 2004). A major shift occurred with the development of concentric construction sites – areas where identical buildings were mass-produced. Between 1956 and 1967, new housing districts (e.g., Spinut, Bol, Skalice, Plokite, Škrape, Lokve) emerged on the city's outskirts, surrounding the existing urban fabric, developed as solitary neighborhoods (Grgić, 2011). Their interconnection though, as well as satisfactory social and other infrastructure, were slower to develop. By the early 1970s, the innovative Split 3 project[5] was already transforming the eastern part of the city with its pedestrian-oriented urban design, representing a significant evolution in Split's urban planning approaches that paralleled the broader rethinking of the city's polycentric structure occurring in the lead-up to MIS.

The city's Mediterranean climate and coastal position made outdoor activities central to urban life, leading to systematic development of sports facilities that established sporting culture and organizational capacity. Key venues emerged along the coastline through the 1950s and 1960s – open-air entertainment and cinemas in Bačvice, swimming-pools in Zvončac, Spinut and Zenta, tennis courts in Firule, as well as swimming, water polo, rowing and sailing clubs – establishing a pattern of sports and recreation

1 The Mediterranean Games are an international multi-sport event held every four years among countries in the Mediterranean sea region. Established by Muhammed Taher Pasha during the 1948 Olympics in London, they are defined as "a regional sporting competition held in accordance with the rules of the Olympic Games" (Šviderski, 1989, cited in Zekić, 2016). From Alexandria (1951) to Split (1979), they were held in Barcelona, Beirut, Naples, Tunisia, Izmir, and Algeria, under the International Olympic Committee (IOC) and the Greek Olympic Committee in Athens (Markovina, 2014).

2 Late socialism (1974-1990) in Yugoslavia was characterized by political decentralization following the 1974 Constitution, economic stagnation and increasing foreign debt, gradual market liberalization and openness to Western influences, evolution of self-management toward a more technocratic approach, and an increased focus on regional development.

3 URBS, acronym retained from the previous name *Urbanistički biro – Split* which operated from 1957 to 1967.

4 Split experienced remarkable demographic growth between 1945-1991, one of the highest in socialist Croatia. The population increased from 48,248 (peninsula limits) in 1948 to 189,388 in 1991. The Municipality area (including today's towns Kaštela and Solin) grew from 97,146 in 1948 to 266,835 by 1991, with growth particularly pronounced between 1961-1971 (Vidak, 2002a).

5 The construction of Split 3 was the largest and most ambitious socialist housing development in the city, which marked the apex of central planning. Envisioned in the late 1960s and built through the 1970s-80s, it covered over 350 hectares, for 37,000 residents, and embodying the socialist self-contained urban neighbourhood (Tušek, 1996). Though it included schools and shopping centres, many planned amenities were never realized, including the envisioned secondary city centre and coastal tourist infrastructure.

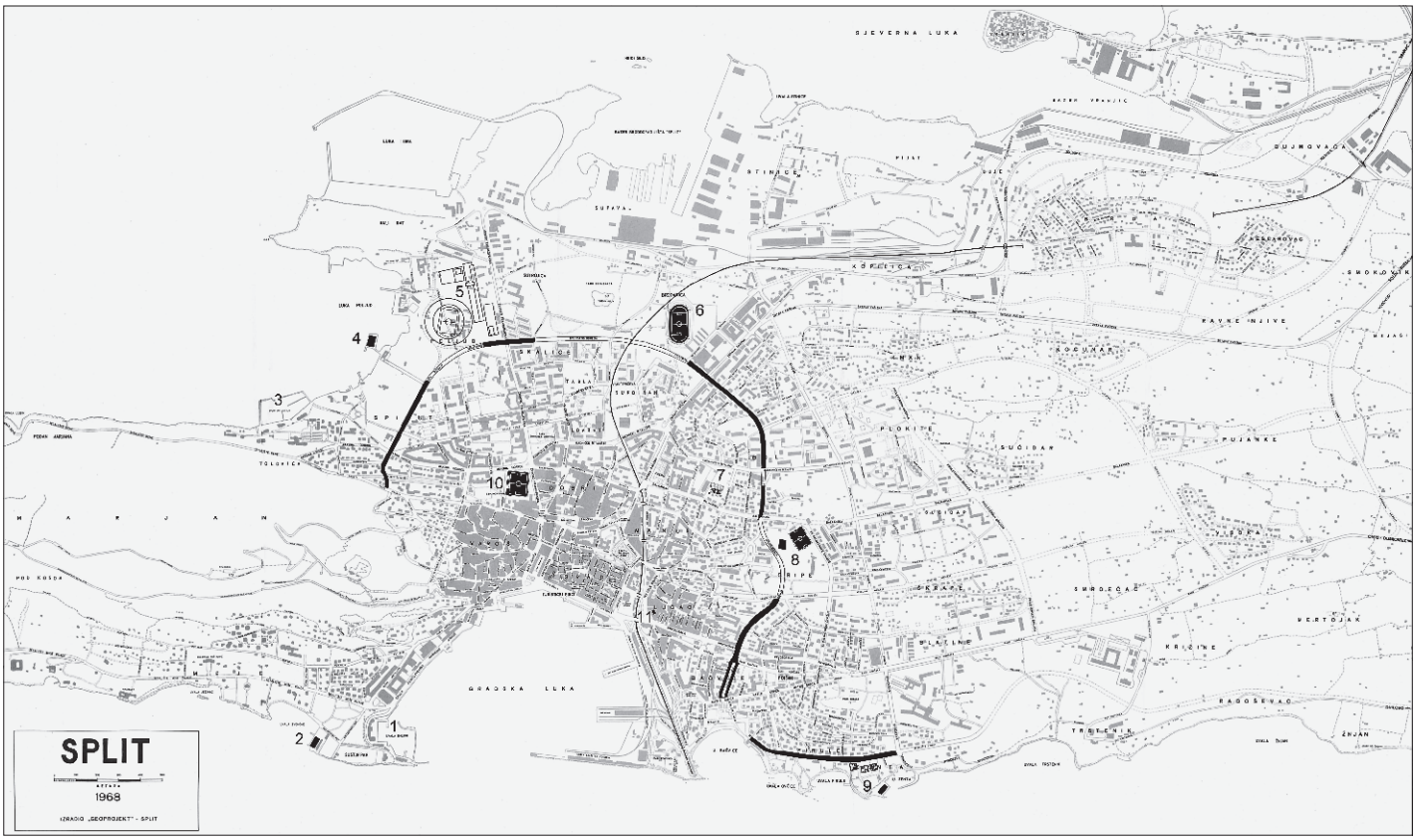


FIG. 2 SPLIT IN 1968 – REALIZED AND PLANNED SECTIONS OF THE RING ROAD (BOLD LINE INDICATES COMPLETED SEGMENTS), AT-GRADE RAILWAY, AND SPORTS INFRASTRUCTURE (CROATIAN SPORTS CLUB ABBREVIATIONS RETAINED IN ORIGINAL FORM): 1. 'JK LABUD' AND 'JK MORNAR' SPORTS MARINA IN BALUNI BAY, 2. 'PK' AND 'VK JADRAN' OUTDOOR SWIMMING-POOL (1936) IN ZVONĆAC, 3. 'JK SPLIT' SPORTS MARINA, 4. 'PK' AND 'VK MORNAR' OUTDOOR SWIMMING-POOL (1955), WITH 'VK GUSAR' AND 'VK MORNAR' ROWING CLUBS IN SPINUT-POLJUD, 5. SPORTS COMPLEX IN POLJUD (AS PLANNED BY THE ARCHITECTS FRANO GOTOVAC AND VLADIMIR JAMAN IN 1967-68), 6. 'RNK SPLIT' STADIUM FOR FOOTBALL AND ATHLETICS IN THE SKOJ PARK (1950S, REMAINED UNFINISHED), 7. 'RK SPLIT' HANDBALL COURT (1968), 8. 'KK JUGOPLASTIKA' BASKETBALL HALL (1968) AND 'NADA' FOOTBALL AND HANDBALL FIELD IN GRIPE, 9. 'TK SPLIT' TENNIS COURTS (1950) AND 'POŠK' OUTDOOR SWIMMING-POOL (1957) IN FIRULE-ZENTA, 10. 'STARI PLAC' FOOTBALL STADIUM (HOME OF 'HNK HAJDUK SPLIT' FROM 1911 TO 1979), 11. 'PK' AND 'VK JADRAN' INDOOR SWIMMING-POOL (1952).

zones (Figs. 2 and 3). The incremental development proved to be substantial – by the 1980s, the city had cultivated 155 sports organizations across 32 different sports branches, with approximately 500 active sports recreation societies, while Split athletes competed in ten Olympic Games, winning 178 medals across Olympic, World, European, and Mediterranean competitions (Petrić, 1986). This foundation provided the basis for the more comprehensive sports infrastructure vision that would be realized through the MIS projects. The post-war period also saw significant interventions in the historic core and its surroundings, with restoration work in Diocletian's Palace and the development of hospitality infrastructure creating a dual identity for the city as both a heritage site and a modern tourist destination. Urban greenery became an important element of the modernization strategy, with several parks and green corridors planned throughout the city, such as the Emanuel Vidović Park (*Park Emanuela Vidovića*), a grove near the SKOJ *Park (Park SKOJevaca)*[6], and new trees in the then-thinned Marjan park-forest. Tourism rapidly developed in the 1960s and 1970s, and became an important segment in establishing the broader cultural strategy tied to the Non-Aligned Movement's politics and the country's internationalization efforts. Facilitated by the growth of mass media and popular culture, tourism was crucial in shaping a desirable lifestyle both domestically and internationally. Sport culture was likewise strongly supported and organised at strategic state levels. In the initial post-WWII years, Yugoslavia undertook a comprehensive analysis of conditions for sports participation, formulated plans for institutions, created legal frameworks, enacted laws, and set goals for constructing gyms and educating professionals (Petrov, 2019). The convergence of tourism growth, state-supported sports culture, and Split's proven international competitive record positioned the city as a compelling candidate to host the Mediterranean Games, transforming decades of post-war sports development into the strategic foundation for international sporting diplomacy.

Split's mayor Jakša Miličić's bold vision to bring the Mediterranean Games to the city, first pursued in 1971 in Izmir, was ultimately realized when mayor Vjekoslav Viđak's second candidacy succeeded in 1975. The city won the vote against Casablanca by 16:9 and was therefore chosen to host the following Games. Though one of the most sports-minded towns in Yugoslavia, at the time when it

was entrusted with organizing the Mediterranean Games, Split did not have a single sports facility meeting the needs of such a large-scale athletic contest, let alone the overall municipal, traffic, technological and cultural infrastructure of the city (Miličić, 2009). The city's sporting excellence thus coexisted alongside infrastructural limitations, generating the urgent need for transformative urban development with new facilities and improved circulation to integrate them citywide. A sports program existed, along with the desired list of sports facilities without project documentation, but with no financial model in sight (Viđak, 2002b). The much-needed big investments were enabled by the signing of the Social Compact on the Organization and Financing of MIS in 1976 when the Split Municipal Assembly (*Skupština Općine Split*)[7], together with the Socialist Republic of Croatia and all the other Yugoslav republics and regions (Socialist Federal Republic of Yugoslavia) assumed responsibility for organizing the Games in three equal parts.[8] This financing principle became the cornerstone of the whole organizational procedure in preparing the event, formalized before Josip Broz Tito's approval to be the official patron of MIS in 1977 (Pezo, 1983).

Institutional Framework and the Planning Process

The implementation of Split's ring road and the broader urban transformation catalysed by MIS emerged through a robust institutional framework characteristic of late socialist Yugoslavia. This framework enabled the coordination of complex planning processes and the realization of ambitious infrastructure within an exceptionally compressed timeline.

By the late 1970s, Yugoslavia had developed a distinctive planning system that combined elements of socialist state coordination with decentralized decision-making. Unlike other socialist states that imposed rigid centralized planning, Yugoslavia's system operated through multiple levels of governance – federal, republican, communal (municipal) – each with specific planning responsibilities. A defining characteristic of Yugoslav planning was the integration of spatial planning within the broader system of 'societal planning'.[9] Through progressive legislation, urban planning in Yugoslavia established a comprehensive hierarchy of planning documents, from republic-level spatial plans to detailed implementation plans for specific urban areas. The MIS preparations coincided with what Tandarić, Watkins and Ives, in their work 'Urban planning in socialist Croatia' (2019), identify as the fourth evolutionary phase of socialist planning in Croatia (1973-1980), characterized by increased environmental awareness, more substantial public participation through local communities, and planning aimed at supporting long-term socioeconomic development. The 1973 legislation introduced a system of physical plans divided into development (long-term) and implementation (short-term) plans, with urban plans covering the settlement level and implementation plans projected for specific development areas (Tandarić et al., 2019).

The institutional structure for urban planning in Split followed a carefully designed system of checks and balances (Fig. 4). The Municipal Assembly held ultimate authority to adopt urban plans and other normative acts. Supporting this body was the Urban Planning Council (*Savjet za urbanizam*), which monitored planning processes, reviewed urban plans, and approved projects before submission to the Assembly. URBS served as the primary planning and technical body, and coordinated with PIS, a specialized municipal institution for urban development implementation. Together, these institutions played a crucial role in the spatial management of the city, mediating between planning concepts and their physical realization.

When Split's application to host the VIII Mediterranean Games was accepted in 1975, alongside physical infrastructure development, an organizational framework was established to coordinate the multifaceted event preparation (Fig. 5). The 'soft infrastructure'[10] was hierarchically structured with

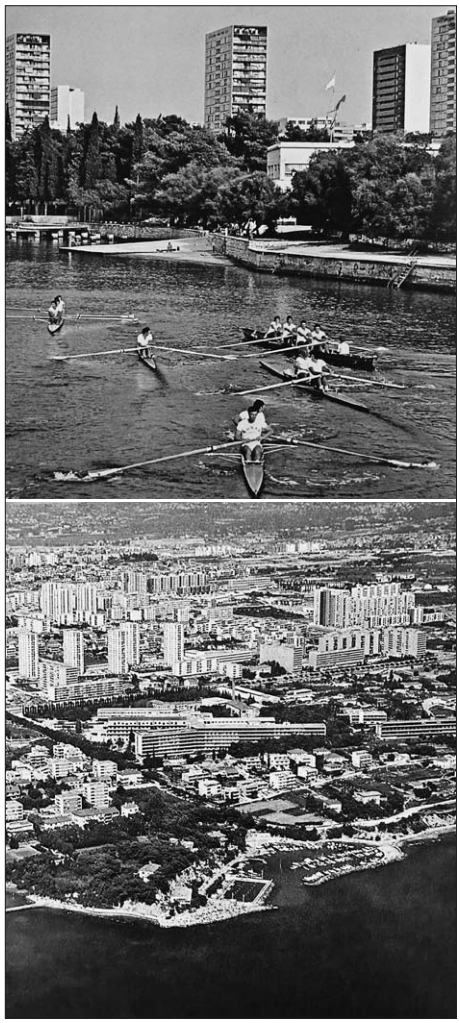


Fig. 3 Split's urban context in the 1970s - integrating sports facilities within the modern city fabric. Rowers of 'VK Gusar' training in Poljud Bay, with high-rise apartment buildings (designed by the architect Ivo Radić in 1968) of the newly developed Spinut neighborhood in the background (up); Aerial view of the marina and recreational facilities in Zenta Bay, with Firule Hospital (designed by the architect Zoja Dumengjic in 1969) and housing development of Split 2 and Split 3 districts visible in the background (down).

6 SKOJ, Cro. *Savez komunističke omladine Jugoslavije* – The League of Communist Youth of Yugoslavia. The Park is also known as the Turkish Tower Park (*Park Turska kula*).

7 The city was governed by the Split Municipal Assembly also referred to as the Split Commune Assembly in official translations. As a socio-territorial unit, the Municipal Assembly was divided into municipalities (*opcine*), which were subdivided into local communities (*mjesne zajednice*), representing the smallest socio-political units of self-governance within the socialist system. For specific information regarding Split's complex administrative structure in the late socialist period, consult the Split State Archives, fond HR-DAST-270 (*Skupština općine Split*).

8 In the end, Split participated with 42,33%, the Socialist Republic of Croatia participated with 32,32%, while the rest of the Federation participated with 14,20%, with 11,15% from other contributors (Viđak, 2002b).

9 In Yugoslavia, societal planning (*društveno planiranje*) differed from social planning. While the latter typically involves guiding community development, societal planning focused primarily on directing economic development (Piha, 1973, cited in Tandarić et al., 2019).

10 Infrastructures are defined as "the systems that enable circulation of goods, knowledge, meaning, people and power" (Lockrem & Lugo, 2012, cited in Salazar et al., 2017), mostly associated with immobility and, as event structures, treated as temporary.

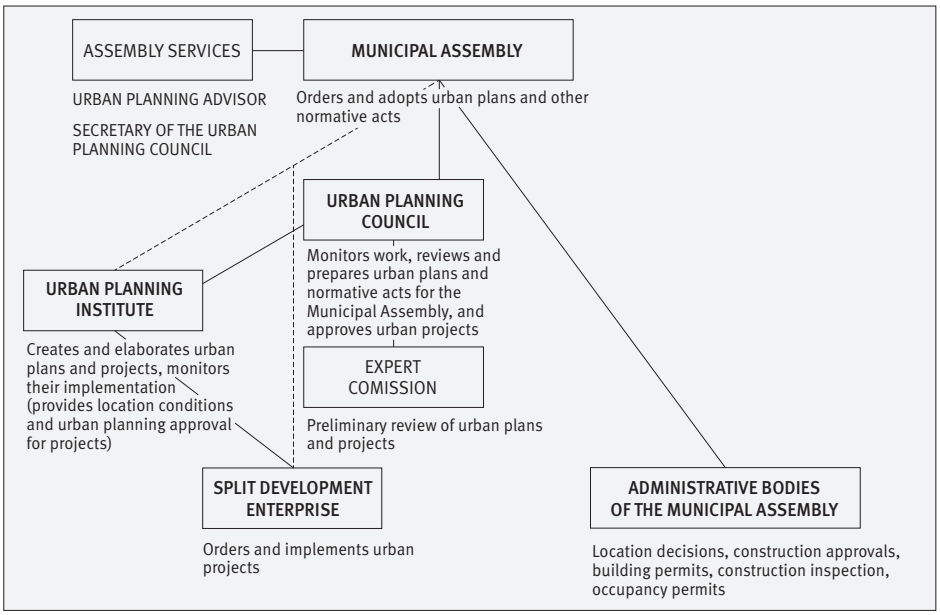
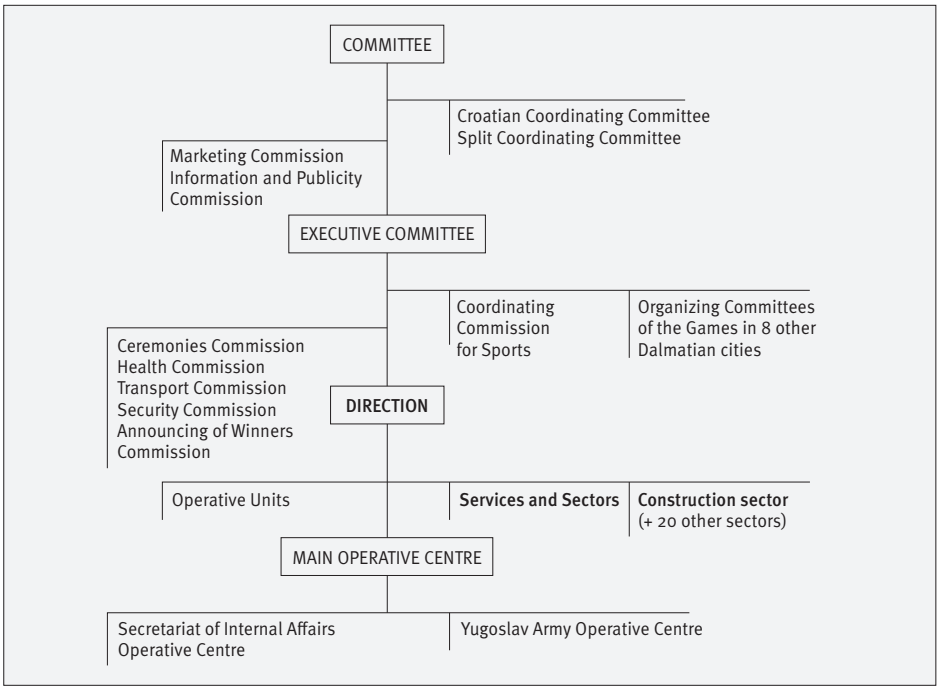


Fig. 4 Organogram of Bodies in the Split Municipality Engaged in the Development and Implementation of the Urban Plan

the Games Committee (*Komitet*) at the apex, consisting of delegates from administrative bodies, sporting organizations, and industry, overseeing all preparation and management. The Executive Committee (*Izvršni komitet*) was appointed from prominent officials to implement decisions, while the Directorate (*Direkcija*), established by the Municipal Assembly in 1977, handled technical organization and management across multiple cities in the Dalmatian region, establishing operational units at each venue (Pezo, 1983). Crucially, the organizational structure included a dedicated Construction Sector (*Sektor za izgradnju objekata*), which operated alongside twenty other sectors and services, highlighting the priority given to physical infrastructure in the preparation of MIS (Pezo, 1983). For the MIS projects, the client role was typically assumed jointly by the Municipal Assembly together with the Games Directorate, creating a direct institutional link between the city's long-term development interests and the Mediterranean Games' immediate requirements.

Fig. 5 Organogram of the VIII Mediterranean Games



URBS emerged in 1947 as The Urban Planning Centre – Split (*Urbanistički centar – Split*), "the first and most significant urban planning and research institution in Split and Dalmatia, one of the oldest and largest such institutions in our country, unique in its organizational structure, the breadth of its professional activities, and its multidisciplinary staff composition" (Matošić, 2003). With its headquarters in Split, it was established in conditions when the city's economic and demographic growth could no longer be accommodated by pre-WWII planning frameworks. Due to a shortage of experts, the centre focused its work on the preparations for the 1951 Directive Regulatory Plan (Pervan, 1966). By the 1970s, URBS had developed into a sophisticated multidisciplinary institution with extensive experience in regional planning, architectural design, and infrastructure development. For MIS, the Institute adapted its structure with specialized departments – Department for Urban Planning (*Odjel za urbanističko planiranje*), Department for Urban Design (*Odjel za urbanističko projektiranje*), Department for Architectural Design (*Odjel za arhitektonsko projektiranje*) and Department for Infrastructure (*Odjel za infrastrukturu*) – with the latter established specifically during preparations for MIS due to the increased workload and complexity of tasks (Šimunović, 2019). Crucially, this multidisciplinary structure enabled the conceptualization of the ring road not as an isolated infrastructure project but as an integrated urban system.

Split's ring road represented the culmination of planning efforts that extended back to the immediate post-war period. The 1951 Directive Regulatory Plan of Split, developed by architects Milorad Družeić and Budimir Pervan, established the foundation for Split's modern urban development (Fig. 6). The most significant direct precursor to the MIS projects was the 1978 GUP, led by architect Berislav Kalogjera who was also instrumental in developing the Regional Plan of Split (*Regionalni plan Splita*) from 1970. The infrastructure aspects of the ring road also benefited from the expertise of civil engineer Slo-

bodan Tedeschi, founder of the URBS's Department of Infrastructure, and later civil engineer Željko Maroević, who developed solutions for the road system based on their work on Split's traffic planning (Bajić-Žarko and Marasović, 2012). What distinguished URBS's approach was effective coordination across disciplines and scales, ensuring technical solutions aligned with broader urban objectives, allowing the Institute to transform long-standing planning visions into reality within a remarkably compressed timeline demanded by the Mediterranean Games.[11]

The Ring Road: Planning and Development

While the robust institutional framework provided the mechanism for implementation and enabled its execution, it was the sophisticated urban planning principles underlying Split's ring road that transformed it from mere infrastructure into a defining element of the city's urban structure and identity. The Mediterranean Games created a pivotal moment that translated decades of theoretical planning concepts into physical reality, bringing to fruition a long-standing planning vision that had, until then, remained largely unrealized.

The 1951 Directive Regulatory Plan, influenced by CIAM[12] zoning principles, already envisioned the ring road's potential, noting "a ring road approximately circumscribes the area of the present city" (*** 1951), and proposed a coastal strip for sports and recreation from Poljud to Sustipan and from Katalinić Hill to Stobreč, alongside three planned centres: in Meje, Spinut-Poljud, and Trstenik.[13] Meje and Spinut-Poljud were already partially functioning with such purposes, although the implementation of planned facilities progressed too slowly and through minor, partial interventions (Matošić, 1967). The 1951 Directive Regulatory Plan's sound concept of separating industrial zones in the north from residential areas in the south with a continuous green protective belt stretched alongside the ring road, established an ecological framework for the city's development, though its complete implementation was unfortunately compromised by illegal residential construction (Matošić, 1967). These concepts can be traced in subsequent plans, which further developed the city's foundational programmatic principles, established the boundaries of the urban conglomeration, and achieved greater alignment with existing legislation, as exemplified by the Decision replacing Split's urban plan from 1968. The Project Split Peninsula from 1975 (Fig. 7) advanced these ideas, emphasizing that "the implementation of the ring road would enable a more efficient connection between the city centre, coastal recreational zones, and residential areas, thus facilitating better distribution of urban functions" (*** 1975). Also, it provided critical analysis of the existing green spaces and sports infrastructure in Split, documenting how "green areas in the city were usually not an integral part of a functional recreational system, but their role was rather reduced to a formal effect" (*** 1975). This assessment revealed the spatial imbalance of green areas and the poor condition of concentrated sports facilities. By mapping sports facilities – from the northwest to the eastern coastal belt the project articulated a comprehensive vision where the ring road would not merely facilitate traffic but integrate these dispersed recreational assets into a coherent system that balanced high-performance sports facilities with spaces for 'mass recreation' accessible to all. Building upon these foundations, the 1978 GUP (Fig. 8) formalized the already implemented prin-

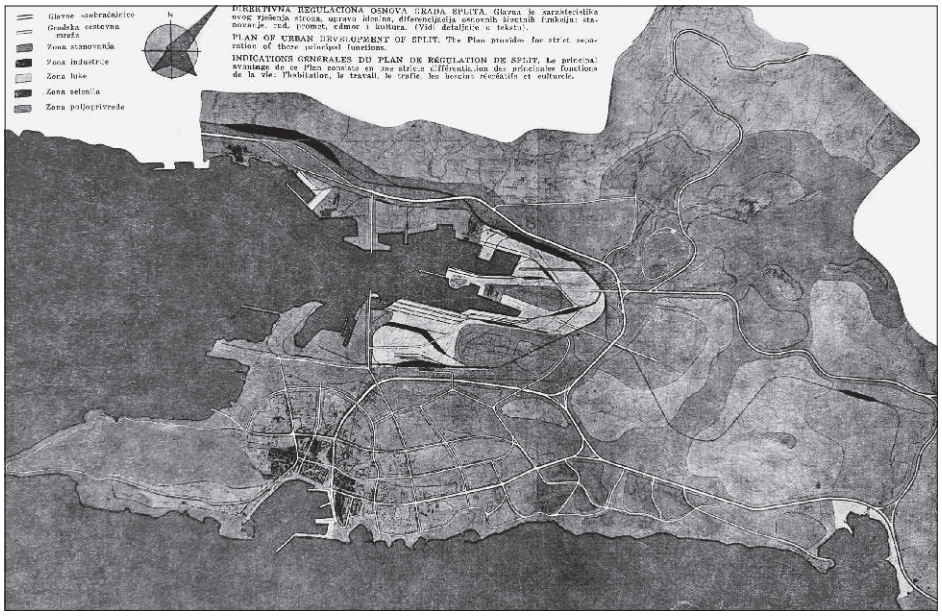


Fig. 6 Directive Regulatory Plan of Split (*Direktivna regulaciona osnova grada Splita*), 1951. The legend includes: Main Transportation Roads (*Glavne saobraćajnice*), Urban Road Network (*Gradska cestovna mreža*), Residential Zone (*Zona stanovanja*), Industrial Zone (*Zona industrije*), Port Zone (*Zona luke*), Green Zone (*Zona zelenila*), Agricultural Zone (*Zona poljoprivrede*).

11 The Institute's significant contribution to the Mediterranean Games was officially recognized when the Split Municipal Assembly awarded URBS with a special commendation for its contribution to the preparation of MIS (Bajić-Žarko and Marasović, 2012).

12 CIAM, Fr. *Congrès Internationaux d'Architecture Moderne* – The International Congress of Modern Architecture (1928-1959), was an international organization promoting modern architecture and urbanism principles, viewing them as economic and political tools for solving global issues, housing crisis and problems of modern cities.

13 When the positioning of the Military Hospital prevented the realization of the main city stadium in Trstenik, as envisioned in the 1951 Directive Regulatory Plan, the Spinut-Poljud regulation (1962-1963) expanded the sports and recreation zone to accommodate it (Matošić, 1967).

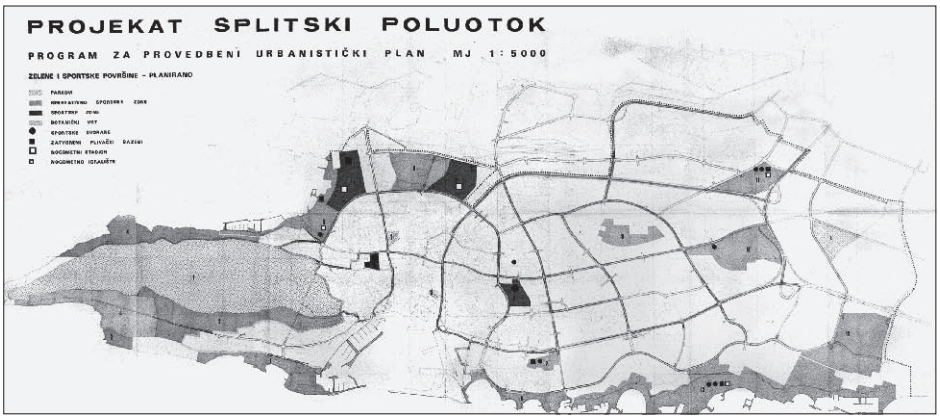
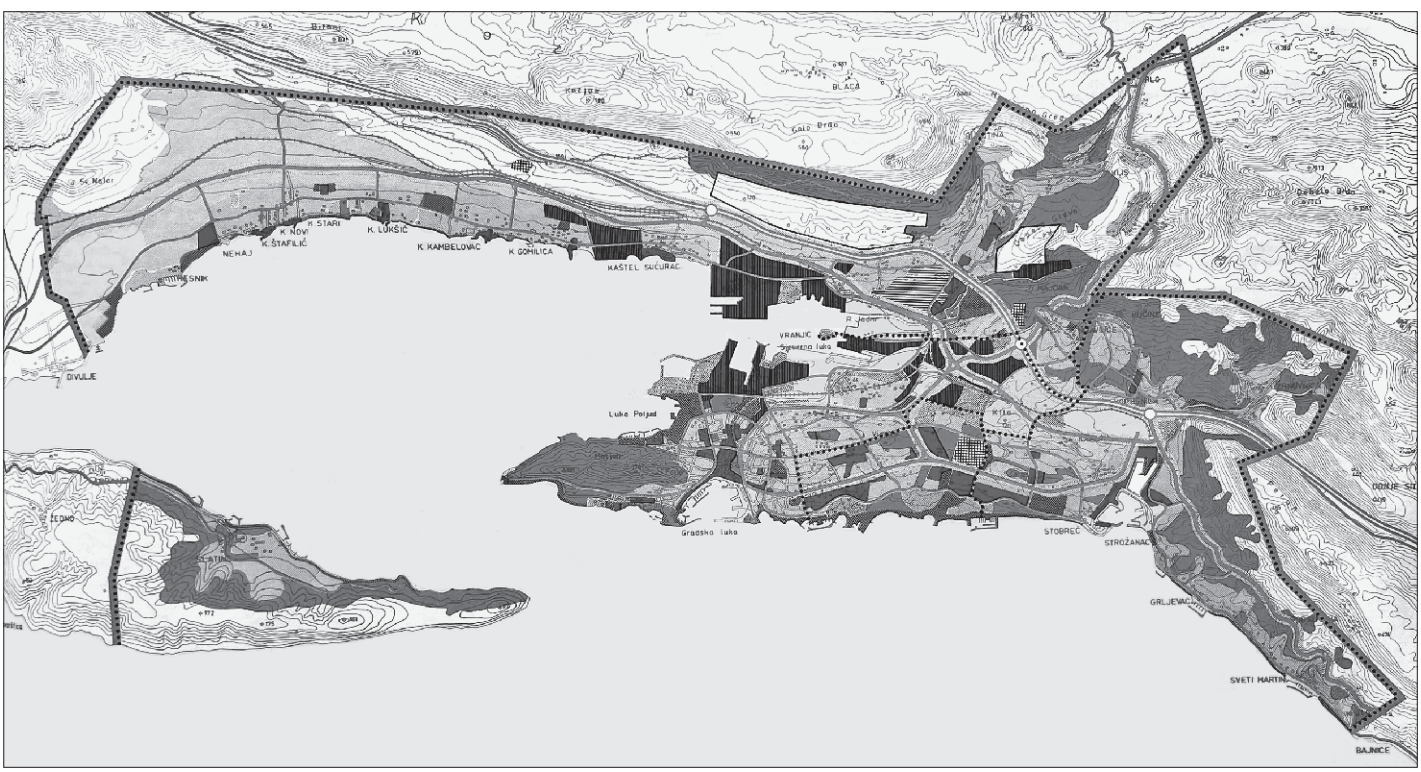


FIG. 7 PROJECT SPLIT PENINSULA – A PROGRAM PROPOSAL FOR THE EXECUTIVE URBAN PLAN (*PROJEKT SPLITSKI POLUOTOK – PRIJEDLOG PROGRAMA ZA PROVEDBENI URBANISTIČKI PLAN*): PLANNED GREEN AND SPORTS AREAS (*ZELENE I SPORTSKE POVRŠINE – PLANIRANO*), 1975. THE LEGEND INCLUDES: PARKS (*PARKOVI*), RECREATIONAL AND SPORTS ZONES (*REKREATIVNO-SPORTSKE ZONE*), SPORTS ZONES (*SPORTSKE ZONE*), BOTANICAL GARDEN (*BOTANIČKI VRT*), SPORTS FACILITIES (*SPORTSKE DVORANE*), INDOOR SWIMMING POOLS (*ZATVORENI PLIVAČKI BAZENI*), FOOTBALL STADIUM (*NOGOMETNI STADION*), AND FOOTBALL FIELD (*NOGOMETNO IGRALIŠTE*).

ciples of the polycentric model of city development, effectively codifying the spatial organization that would guide Split's development in the coming decades. Its spatial organization followed a hierarchical network of functional focal points that divided urban activities while providing orientation (Grgić, 2011). The planned ring road reflected an understanding of functional connectivity, linking residential zones, recreational areas, and public facilities. The plan addressed traffic congestion while facilitating an uninterrupted pedestrian network that enhanced urban livability. The ring road was conceived not merely as a traffic solution but as the structural element that would physically manifest this polycentric vision by connecting emerging subcentres as the new focal points. Surprisingly, despite 1978 GUP being adopted when preparations for MIS were already in their final phase, the document makes no explicit reference to the event.

Preparations for MIS provided an urgency, as well as an opportunity to synthesize these previously unrealized concepts into a cohesive implementation strategy.[14] Realization of the ring road followed a route that had been consistently envisioned in development plans since 1951 (Fig. 9). Starting on the city's southwest coast in Meje area along Ognjen Prica St.[15], continuing via the Marjan tunnel to the sports and recreation Spinut-Poljud zone (Josip Poduje St.), then winding through the SKOJ Park (Split Partisan Detachment St.), and further down to the Socialist Youth Centre and Sports Centre 'Gripe' via the Liberation St., its continuation leads to the tennis courts in Firule and the southeast (May 1st promenade), with a planned section towards Shooting Sports Centre in Stobreč. This strategic alignment not only facilitated efficient logistics during MIS by connecting all competition venues via the ring road, but also established an enduring infrastructure for public programs that would benefit the city long after the event's conclusion. Beyond sports facilities, the MIS Integral Plan (*Integralni plan MIS-a*) – a special operative plan for the construction and adaptation of the facilities

FIG. 8 GENERAL URBAN PLAN OF SPLIT (*GENERALNI URBANISTIČKI PLAN SPLITA*, GUP), 1978



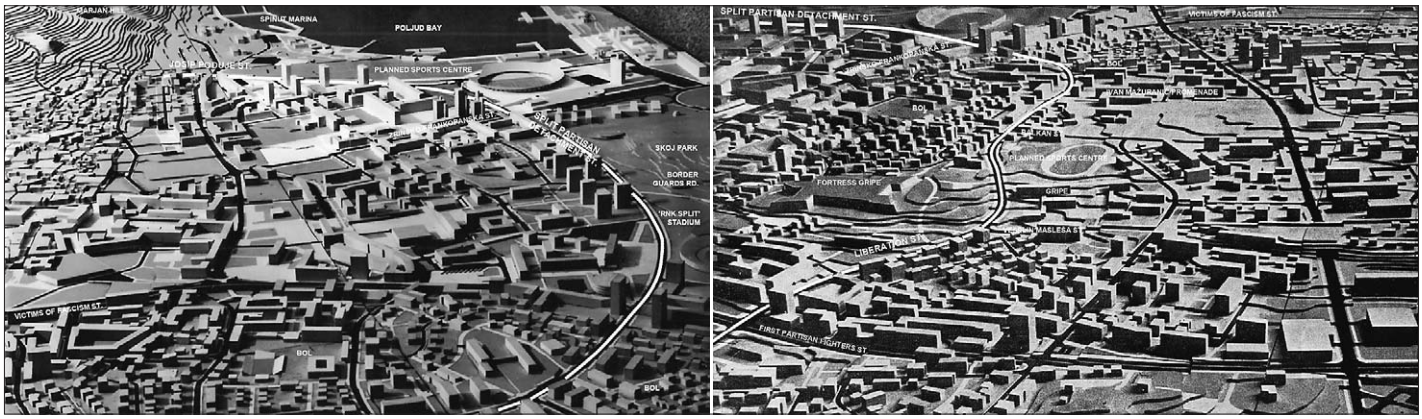


Fig. 9 The ring road shown in an urban model of Split: from Marjan Hill and Poljud Bay to Bol area (left), and from the 'RNK Split' Stadium in the SKOJ Park to Gripe area (right), 1967-68

other than those used for the competitions – was adopted in 1978 as a priority component of Split's Municipality Development Plan (*Srednjoročni plan razvoja Općine Split*) for 1976-1980, addressing comprehensive infrastructure needs including accommodation facilities, public utilities, and transportation infrastructure essential to the event's success while serving the city's long-term development goals (Pezo, 1983). According to the MIS Integral Plan, the ring road's implementation required sensitive integration with both Split' existing urban fabric – residential areas, parkways, and existing streets – and its broader infrastructure systems. Designed as the city's primary artery "the ring road encompassed multiple segments including Josip Poduje St. from the northern exit of the Marjan tunnel to Zrinsko-Frankopanska St., and Split Partisan Detachment St. to Balkan St. and the Main Sports Hall 'Gripe'" (*** 1978). Implementation involved significant infrastructure upgrades, including the widening of Josip Poduje St. alongside the stadium and construction of an underpass beneath Split Partisan Detachment St. at its intersection with Border Guards Rd. The development faced technical challenges[16] that required careful coordination with other construction projects in Gripe and SKOJ Park, resulting in some delays from the planned timeline (*** 1978). Particularly notable was the construction of the 870-meter-long Marjan tunnel[17], which along with the reconstruction of a large number of city roads, intersections, and thoroughfares, significantly enhanced Split's overall transportation network while allowing the ring road to navigate the city's challenging topography.

The ring road transcended its functional role as mere infrastructure to become a defining component of Split's urban identity, weaving together landscapes, recreational spaces, and architectural landmarks into a new experiential framework. This transformative quality distinguishes the ring road from conventional infrastructure projects, highlighting its contextual implementation of post-war urban planning principles and its enduring legacy in fundamentally reshaping Split's urban structure and identity. By facilitating the shift from a monocentric to a polycentric city model, the ring road established a framework for balanced development that continues to influence Split's evolution. The project remains a powerful example of how short-term catalysts like sporting events can be leveraged to achieve long-term urban planning objectives while remaining sensitive to local context and needs.

Conclusion

Split's' ring road represents a contextual and enduring implementation of post-WWII urban plans, prompted by the preparation for the VIII Mediterranean Games in 1979. The project became one of the significant transformative endeavours that were brought about by MIS, accelerating decades of urban planning ambitions under the pressure of a major international event. Exceeding just a pragmatic traffic solution, the ring road redefined the city's spatial logic by linking emerging urban subcentres and integrating them into a coherent, polycentric structure envisioned in Split's 1970s planning documents. It responded sensitively to Split's specific topography, bridging hills, coastline, and historical fabric, creating a network that complemented rather than disrupted the existing urban identity.

14 Meanwhile, the Municipal Assembly announced a republic-wide survey competition for the urban regulation for part of Split's centre, entrusting the program development to URBS (Bjelajac, 2009). Although the competition was actually the third post-war attempt to establish a city axis of a pedestrian corridor from the old core northward toward the SKOJ Park (Tušek, 1996), despite the favourable MIS moment, it failed to be realized.

15 For reference to all streets mentioned, see the List of Street Names in the appendix, which includes both socialist-era names (1945-1990) and current names.

Fig. 10 Sports and Shopping Center in Gripe (designed by the architects Slaven Rožić of URBS, and Živorad Janković; up); Sports complex in Poljud (The City Stadium designed by the architect Boris Magaš with the civil engineer Boženko Jelić as the construction designer, and the Swimming-pools designed by the architect Ivan Antić; down)

MIS provided a powerful impetus for implementation, institutional focus, funding, and public attention toward a project that reshaped both infrastructure and identity of the city, with a legacy that lingers half a century later. Through the workings of the Urban Institute of Dalmatia – Split, the MIS initiative demonstrated an extraordinary synthesis of urban planning, architecture, landscape and urban design (Fig. 10). The coordinated realization of parks, green belts, sports and public facilities established infrastructural integration catering to local daily life, while the road's experiential qualities reinforced Split's modern image as both a Mediterranean city and a regional urban centre. With both sports and tourist facilities, public spaces and urban infrastructures, MIS came to be a landmark moment in the city's evolution, providing a model for event-driven development which transcends short-term spectacle to produce lasting urban transformation.

The political background and institutional organization which enabled such a systematic and comprehensive development on various scales should be viewed in a broader context of post-war modernization which brought about a wider urban and architectural transformation. Several cities experienced a comparable accelerated development brought about by sporting events fiercely supported by the state: beside the Mediterranean Games in Split in 1979, the Sarajevo Winter Olympics in 1984 and the Universiade[18] in Zagreb in 1987 epitomized the efforts the former country invested in positioning itself internationally through tourism and sports. The lasting impact of a new identity which, in the case of Split, was legible through large-scale infrastructures as much as through comprehensive visual identity development influenced the city of Split for decades to come.

16 Implementation faced several technical challenges: drainage along Victims of Fascism St. and Border Guards Rd. required coordination with railway cutting construction; the Mažuranić promenade – Balkan St. segment was only partially completed, while the Balkan St. – Masleša St. segment of the Liberation St. remained unfinished by the time of MIS due to property rights issues and insufficient funding. Construction was carried out by 'Cestar' company, with 'Elektrodalmacija' responsible for lighting installation (*** 1978). The May 1st Promenade section from Gubec St. to Hektorović St. remained unrealized to this day.

17 The Marjan tunnel concept can be traced back to the Implementing Urban Plan for the Marjan peninsula (*Provedbeni urbanistički plan marjanskog poluotoka*) from 1973 (Bjelajac, 2009), and earlier to the Detailed Urban Plan for the Marjan peninsula (*Detaljni urbanistički plan Marjana*) from 1971 (*** 1973).

18 The Universiade (now called the FISU World University Games) is an international multi-sport competition for university athletes organized by the International University Sports Federation.

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Illustration sources

Fig. 1 Authors, 2025 (according to Pezo, 1983)
Fig. 2 Authors' intervention, 2025 (*** 1969)
Fig. 3 Facebook group 'Split kroz povijest'
Fig. 4 Authors, 2025 (according to Kalogjera et al., 1966)
Fig. 5 Authors, 2025 (according to Pezo, 1983)
Fig. 6 *** 1951
Fig. 7 DAS
Fig. 8 AFZG
Fig. 9 Authors' intervention, 2025 [DAST-URBS] (left); Kalogjera, 1967 (right)
Fig. 10 CCN

List of street names

1. Balkan Street (*Balkanska ulica*) / Vukovarska Street (*Vukovarska ulica*)
2. Border Guards Road (*Put graničara*) / Glavičine Road, Ante Starčevic Street, and Croatian Fraternal Community Square (*Put Glavičina, Ulica Ante Starčevića i Trg Hrvatske bratske zajednice*)
3. First Partisan Fighters Street (*Ulica Prvoboraca*) / King Zvonimir Street (*Ulica kralja Zvonimira*)
4. Ivan Mažuranić Promenade (*Šetalište Ivana Mažuranića*) / street name remained unchanged
5. Josip Poduje Street (*Ulica Josipa Poduje)* / Seven Kaštela Street (*Ulica Sedam Kaštela*)
6. Liberation Street (*Ulica Oslobođenja*) / Freedom Street (*Ulica Slobode*)
7. Matija Gubec Street (*Ulica Matije Gupca*) / street name remained unchanged
8. May 1st Promenade (*Šetalište I. Maja*) / Bačvice Promenade, Josip Hatze Park, Petar Preradović Promenade, Firule Road, and Ivan pl. Zajc Street (*Šetalište Bačvice, Perivoj Josipa Hatzea, Šetalište Petra Preradovića, Put Firula i Ulica Ivana pl. Zajca*)
9. Ognjen Prica Street (*Ulica Ognjena Price)* / Stjepan Gunjaća Street (*Ulica Stjepana Gunjaće*)
10. Petar Hektorović Street (*Ulica Petra Hektorovića*) / street name remained unchanged
11. Split Partisan Detachment Street (*Ulica Splitskog odreda*) / Croatian Navy Street (*Ulica Hrvatske mornarice*)
12. Veselin Masleša Street (*Ulica Veselina Maslešе*) / Matice hrvatske Street (*Ulica matice hrvatske*)
13. Victims of Fascism Street (*Ulica Žrtava fašizma*) / Croatian War of Independence Street (*Ulica Domovinskog rata*)
14. Zrinsko-Frankopanska Street (*Ulica Zrinsko-Frankopanska*) / street name remained unchanged

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Conceptualization: A.Č., M.R.Č. and L.S.; methodology: A.Č., M.R.Č. and L.S.; formal analysis: A.Č.; investigation: A.Č.; writing – original draft preparation: A.Č. and M.R.Č.; writing – review and editing: A.Č., M.R.Č. and L.S.; visualization: A.Č.; supervision: M.R.Č. and L.S. All authors have read and agreed to the published version of the manuscript.

Fig. 1 Hotel Visoko, Visoko

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Spaces of Synthesis: Universal Values and Regional Identity in Zlatko Ugljen's Architecture

architecture of respect
critical regionalism
phenomenology of space
Ugljen, Zlatko
universality

Zlatko Ugljen's architecture represents a profound engagement with the interplay between regional identity and universal architectural values. Through an analysis of his most significant works, this paper examines how Ugljen synthesizes traditional construction principles with modernist architectural expression, ensuring the continuity of spatial and cultural meaning. Particular attention is given to the concept of the *architecture of respect,* analyzed within the theoretical frameworks of critical regionalism and the phenomenology of space. Furthermore, the paper investigates the impact of socio-political contexts – ranging from socialist Yugoslavia to the post-conflict reconstruction of Bosnia and Herzegovina – on Ugljen's architectural practice. Employing a methodological framework that integrates a comparative analysis, case studies, and a phenomenological approach, the paper explores the materiality, spatial organization, and symbolic dimensions of his architectural solutions. The findings suggest that Ugljen's work serves as a paradigm for contemporary architectural practice, demonstrating how regional identity can be reaffirmed while simultaneously establishing universal spatial values capable of addressing the challenges posed by globalization and cultural fragmentation.

INTRODUCTION

Zlatko Ugljen is a Bosnian Herzegovinian architect, born in Mostar in 1929. His works embody a synthesis of regional traditions and universal architectural principles, integrating the spirit of place *(genius loci)* with modernist design. Rather than existing in isolation, his architecture engages in an ongoing dialogue with tradition, space, and temporal context. Ugljen's phenomenological approach facilitates the reinterpretation of traditional building techniques within a contemporary framework, resulting in architecture that both preserves historical continuity and addresses the challenges of modernity.

His work can be analyzed through the lens of critical regionalism (Frampton, 1983), which advocates for an architecture that is deeply rooted in local traditions while remaining contemporary in both expression and technology. Additionally, it aligns with the phenomenology of space (Norberg-Schulz, 1980), a theoretical framework that explores how architecture shapes spatial experience and fosters an emotional connection between users and their environment. These two theoretical perspectives provide a foundation for understanding Ugljen's architecture as neither a strict adherence to modernism nor a mere replication of tradition, but rather a synthesis of the local and the global.

This raises the question: How does Zlatko Ugljen's architecture achieve universal values through a dialogue with regional identity?

Ugljen's architectural expression can be contextualized within the work of architects such as Frank Lloyd Wright and Le Corbusier, whose spatial design concepts have profoundly influenced contemporary architecture. Wright's philosophy of organic architecture (Perović, 2009), which emphasizes harmony between architecture and the natural environment, is evident in Ugljen's projects, where buildings do not dominate their surroundings but instead integrate into the landscape. Conversely, Le Corbusier's modernist principles and his emphasis on abstract forms are reflected in Ugljen's minimalist approach to volume, light, and materiality. Ugljen masterfully synthesizes these two approaches, reinterpreting traditional architectural elements through modernist forms and materials in order to create works that transcend local boundaries and embody universal values. His architecture is not only functional but also symbolic and transcendent, making it particularly significant in contemporary discourse on the architecture of respect.

Ugljen has created and continues to create across two key socio-political periods: the era of socialist Yugoslavia (SFRY, 1945-1991) and the post-Yugoslav context following the dissolution of the SFRY. During the socialist period, architecture was predominantly shaped by modernist principles, supported by a strong institutional framework that fostered the development of public, residential, and infrastructure projects. Within this context, Ugljen's work reflected a commitment to functionality, rationality, and collective values, while his approach remained focused on the harmonious integration of modernist architectural language with local cultural traditions.

Following the breakup of Yugoslavia, economic, political, and cultural circumstances underwent significant transformations. The transition from socialism to capitalism had a profound impact on architectural production – whereas architecture was previously planned within the framework of state investments, the post-Yugoslav period saw market-driven principles and privatization take precedence. In this shifting landscape, Ugljen's work testifies to the continuity of his philosophy of the architecture of respect. While some of his earlier projects were neglected or even destroyed, his later works sought to reaffirm universal spatial values within increasingly complex political conditions. Across both periods, his architecture remains deeply connected to the spirit of place *(genius loci)*. Regardless of socio-political changes, his projects consistently adhere to the principles of contextuality, respect for space, and an inclusive architectural expression.

Zlatko Ugljen's Architectural Work: Tradition, Modernity, and Continuity

A historical analysis of the architectural heritage of Bosnia and Herzegovina reveals a clear symbiosis of tradition and modernity in the works of Zlatko Ugljen. His architecture can be understood as part of an ongoing exploration of regional identity, whereby architectural expression is not conceived as an isolated act but rather as an extension of cultural and spatial heritage. This approach aligns with the theory of critical regionalism (Frampton, 1983), which advocates for the reinterpretation of local architectural elements through contemporary methods, thereby producing architecture that is both contextually rooted and universally resonant.

A significant impact on Ugljen's work came from architect Juraj Neidhardt (Fig. 2), a pivotal figure in the architectural history of Bosnia and Herzegovina, who communicated Le Corbusier's modernist principles and tailored them to fit the local context. Ugljen was his student and collaborator, and his early works reflect the synergy of modernist reduction of form and traditional constructive solutions, as confirmed by his statement: "In architecture, continuity is not only desirable – it is necessary. Architecture does not start from nothing, but from the understanding and reinterpretation of what exists." (Ugljen, archive)

Continuity and Regional Identity in Architecture

One of the key concepts evident in Ugljen's work is the development and reinterpretation of the "Bosnian style"[1], first introduced into the architectural discourse of Bosnia and Herzegovina by Josip Pospišil. This concept, later expanded through the work of Juraj Neidhardt, integrates traditional elements of the Bosnian house, as well as oriental and Mediterranean architectural typologies, with contemporary technological advancements. Neidhardt's contribution to this discourse is particularly evident in his book *Arhitektura Bosne i put u suvremenno* (*The Architecture of Bosnia and the Path to the Modern Age*; Neidhardt and Gabrijan, 1957), where he establishes the foundations of critical regionalism within the framework of Yugoslav modernism.

Ugljen's work continues this line of research, but with a more pronounced transcendence of material space, which brings him closer to a phenomenological approach to architecture (Norberg-Schulz, 1980). His projects, such as the *White Mosque* in Visoko and the *Hotel Ruža* in Mostar, are not only interpretations of local architectural traditions, but also spatial manifestations of universal principles of architectural creation.

Ugljen's architecture does not imitate the past, but redefines it through contemporary architectural languages, maintaining the key values of space – harmony with the environment, material authenticity and the sensory experience of the user. This methodology can be compared to the work of Alvar Aalto, whose projects combine local materials with modernist formal principles, creating architecture that not only responds to functional needs, but also communicates with human perception of space.

Ugljen's works are often described as sculptural forms that blend harmoniously into the landscape, not dominating the space but becoming an integral part of it. This approach can be analyzed through the lens of Wright's organic architecture, where architecture emerges from the natural environment, as well as through Le Corbusier's modernist rationalism, which emphasizes purified geometric forms and technologically innovative solutions.

As Sadudin Musabegović[2] observes, Ugljen's architecture represents a synthesis of modernist and postmodernist tendencies:

'He has one foot in modernism, as he does not renounce the structure, but entrusts it to civil engineering, and the other in postmodernism, as he reintroduces the decorative, regional, and national alongside the past – elements that, if not entirely excluded, were at least largely neglected in modernism.'

This duality in Ugljen's architecture is particularly evident in his sacred architecture, where he employs pure materiality and minimalism while embedding profound symbolic meaning.

Ugljen's work can be understood through the concept of the architecture of respect, which signifies a harmonious relationship between space, user, and architectural expression. This principle extends beyond its regional context and aligns with global tendencies in critical regionalism and phenomenological architecture. His architecture transcends lo-

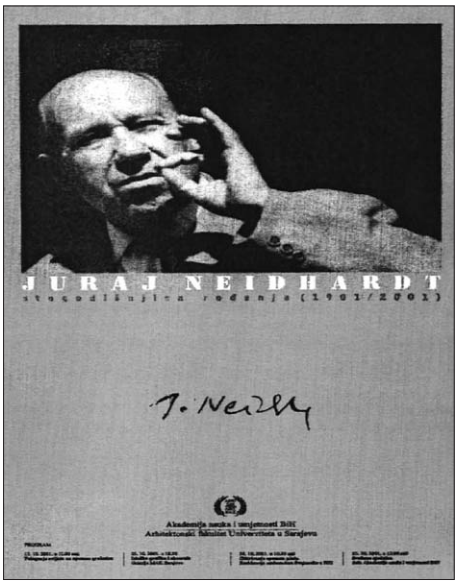

Fig. 2 Poster as part of the centennial celebration of the birth of architect, professor, and academician Juraj Neidhardt, Sarajevo, October 2001

1 A wave initiated by intensive construction and the emergence of critical architectural thought in Bosnia and Herzegovina at the turn of the 19th and 20th centuries spurred a movement among architects and engineers to establish a Bosnian architectural style. One of its founders was architect Josip Pospišil in 1910. (Krzović, 2004)

2 Sadudin Musabegović was one of the most significant art theorists and modern thinkers in Bosnia and Herzegovina after World War II. He also engaged in film directing, producing the short film *Soba* for Sarajevo's Sutjeska Film in 1972. He served as chief editor of the journal *Opredjeljenja*, the magazine *Odjek*, and as responsible editor of *Dijalog*. (ALU Sarajevo)

cal cultural specificities by communicating universal spatial values – light, proportion, materiality, and rhythm. Works such as *Šerefudin's White Mosque* in Visoko and the *Church of Our Lady of the Angels* in Zabilje exemplify how architecture can translate spiritual and cultural narratives into spatial forms, and rather than conforming to conventional religious typologies, embody the essential universality of sacred space.

While Ugljen's architecture is widely recognized for its sensitivity to context, some of his projects exhibit a distinct architectural autonomy, where spatial expression is guided more by internal conceptual logic than by direct adaptation to the surrounding environment. A notable example is the *Kalin Hotel* in Bugojno, which, unlike his sacred and public buildings, prioritizes formal independence over contextual integration.

Ugljen maintained meticulous control over every phase of his projects, with his distinct authorial signature evident not only in spatial composition but also in materialization, detailing, and the way users engage with his architecture. His approach resonates with Wright's philosophy of integrating architecture with daily life, particularly in how his designs emphasize carefully orchestrated proportions, rhythm, materiality, and light to enhance human experience. However, whereas Wright's organic architecture seeks harmony with the natural landscape, Ugljen's work often negotiates between contextual sensitivity and formal autonomy, allowing his architecture to assert its presence while remaining attuned to spatial and cultural narratives. This human-centered design philosophy aligns with the phenomenology of space (Norberg-Schulz, 1980), where architecture is understood not as a static object but as an experiential and sensory phenomenon. Through this lens, Ugljen's architecture fosters a deeper emotional and perceptual engagement, reinforcing the notion that built space is not merely inhabited but actively lived and felt.

Ugljen's engagement with tradition is so intrinsic to his work that all his projects are defined by an ongoing dialogue between the past and the present. His architecture is not a nostalgic reconstruction of history but rather a reinterpretation of architectural elements through contemporary materials, forms, and construction methods. Such approach aligns with the principles of critical regionalism (Frampton, 1983), where local architectural identity is not viewed as static but as an evolving construct within a contemporary context.

Across his projects – whether sacred, public, or private – Ugljen consistently achieves a harmonious relationship between space, user, and the natural environment. This sensibility closely parallels the philosophies of Alvar Aalto and Frank Lloyd Wright, both of whom sought to bridge humanistic values and modernist principles through architectural practice.

Ugljen's architecture is frequently described as poetic, not only for its artistic expression but also for its ability to shape atmospheric experiences both inside and outside its spaces, resonating with a phenomenological approach to architecture, where materiality, light, sound, and spatial relationships shape an experiential understanding of space that extends beyond its purely functional dimension. This concept is particularly relevant in contemporary research on affective architecture, which explores how space communicates not only visually but also through sensory perception and the emotional responses it elicits from users (Pallasmaa, 2005).

Although such metaphors are rarely employed as analytical tools in academic discourse, the concept of spatial atmosphere and affective experience (Zumthor, 2006) offers a theoretical foundation for understanding this relationship. Ugljen's spaces, through lighting effects, material textures, and interaction with nature, cultivate spatial experiences that extend beyond rational perception, fostering a profound emotional connection between the user and the architecture.

RESPECT FOR CONTEXT AND ARCHITECTURAL UNIVERSALITY

Towards the late 1970s, some of the most significant projects in Zlatko Ugljen's oeuvre were realized, with *Hotel Visoko* in Visoko (1974), *Hotel Ruža* in Mostar (1974), and *Hotel Bregava* in Stolac (1975) standing out as key works that illustrate the continuity and evolution of his architectural expression. These hotels are not only exemplars of modernist design but also landmark achievements of Yugoslav architecture, demonstrating a synthesis of functional requirements, spatial sensitivity, and local identity.

3 The author recognizes bioclimatic design principles, creating a comfortable and authentic space through form and structure, natural ventilation, water integration in the form of channels, and the planting of local vegetation.

4 Several prominent individuals have called for a halt to the ongoing permanent erasure: "Speaking about the 'restoration' of *Hotel Ruža,* he noted that it was 'first vandalized and then, again in an act of vandalism, rebuilt without restraint or scruple – but as something

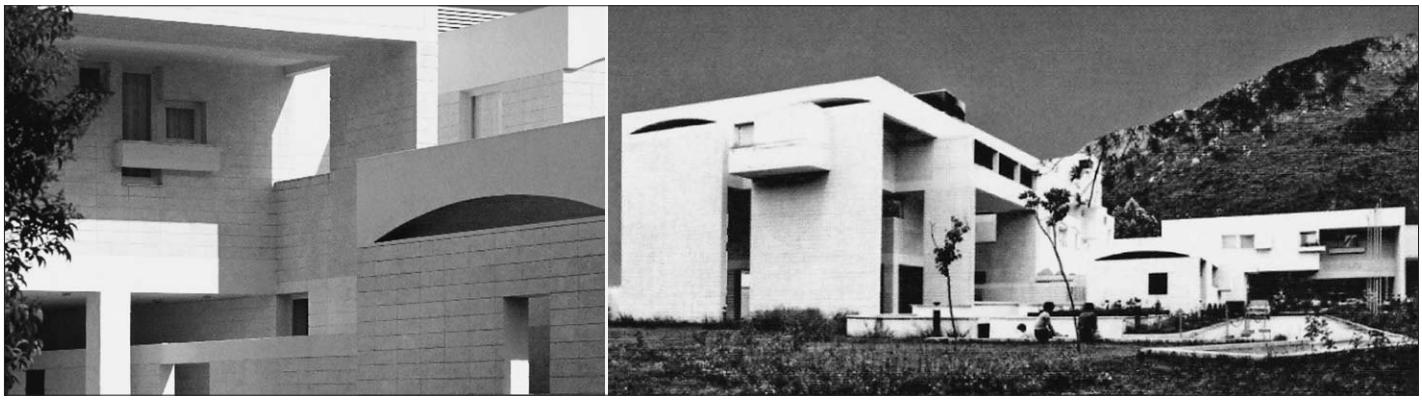

Fig. 3 Hotel Ruža, Mostar

Over the course of 50 years, the key aspects of Ugljen's architectural approach become apparent.

His projects are shaped by three fundamental principles:

1. A universal approach to functional design – Architecture is guided by rational spatial principles while maintaining a deep sensitivity to user experience.

2. Respect for natural and cultural context – Ugljen's projects do not replicate the past but reinterpret regional elements through a contemporary architectural language.

3. Plasticity of space and light – Ugljen employs light and shadow as integral design tools, shaping dynamic visual narratives within the spatial composition.

Hotel Ruža: Dialogue with Context and Destruction of Architectural Heritage

Hotel Ruža in Mostar (Fig. 3) is situated within a complex urban fabric, embodying a synergy of modern and postmodern architecture. The project integrates traditional design elements with rational spatial organization, where the dimensions of openings, the rhythm of the façade, and materiality harmonize with the historical character of Mostar.

Hotel Ruža was one of the most significant examples of critical regionalism in Yugoslav architecture, where architectural form is not imposed on the space but shaped in accordance with the microclimate and contextual specificities. Ugljen creates a space that protects the individual, offering shelter, much like Wright's long, white-painted eaves on his villas. The influence is also evident in the horizontal playfulness of the masses at ground level.

The interplay of light and shadow, a defining element in all Ugljen's works and a key design tool for generating endlessly shifting images of plasticity, is particularly pronounced in this project. Ugljen expresses elements of tradition using arches, as well as the careful dimensioning and positioning of openings. The interior of the hotel, conceived as a space of interpenetration, integrates water, greenery, and spatial organization to create an authentic Herzegovinian ambiance. Although energy efficiency was not a dominant concern at the time, Ugljen's approach to volumetric composition and the natural protection of façades demonstrates a deep sensitivity to the microclimate[3], orientation, and solar exposure.

The destruction of *Hotel Ruža* during the war in Bosnia and Herzegovina[4] (1992-1995) can be viewed within the broader context of the systematic devastation of cultural heritage in conflict zones (Riedlmayer, 2002). As UNESCO emphasizes, the deliberate destruction of architectural heritage in wartime represents not only a material loss but also a symbolic one, where architecture becomes a target of ideological and cultural conflict.

In recent years, a new building has been constructed on the same site, with architectural and urban planning solutions that significantly diverge from the original principles of contextual integration. This shift reflects a broader change in architectural paradigms in the post-socialist period, where the principles of planned and culturally conscious design have been supplanted by market-driven investments and neoliberal urbanization (Jansen, 2005).

entirely different, degrading and humiliating the artistic and cultural dignity of architecture itself for profit... under the logic of an unfettered economy.'" (Essayist and professor Dr. Sadudin Musabegović)

"Ugljen's misfortune is that the architectural masterpieces he built have, within his lifetime, met the fate of Heraclitean pebbles, played with by the cruel child of time." ; "When the storm and frost come – roses are the first to perish." (Poet Mile Stojić, 2010)

FIG. 4 HOTEL BREGAVA, STOLAC

HOTEL BREGAVA: THE INTEGRATION OF ARCHITECTURE AND LANDSCAPE

The town of Stolac, located in eastern Herzegovina, is one of the most significant sites of cultural stratification in Bosnia and Herzegovina, where elements of ancient, Ottoman, and Austro-Hungarian architectural heritage coexist. Ugljen's *Hotel Bregava* (1975; Fig. 4) demonstrates a high level of architectural sensitivity to its surroundings, with the roof forms, façade proportions, and the dimensioning of openings carefully aligned with the traditional typology of the Herzegovinian house.

Its integration with the landscape can be linked to Frank Lloyd Wright's organicism, where architectural form adapts to the natural terrain rather than subordinating it. The use of stone, wooden details, and traditional motifs in a modern interpretation highlights the strength of Ugljen's architectural language.

He describes the *architecture of respect* as culturally attuned, emphasizing that architecture should grow into its environment rather than merely be placed within it. Inspired by the beauty of the Herzegovinian landscape – characterized by the serene architecture of residential complexes, stone roofs emerging behind courtyard walls, the olive-green hues of the landscape, and the clear waters of the Bregava River adorned with the red tones of roses and pomegranate fruit – Ugljen created a composition of sloping roofs with pronounced elements such as chimneys, overlapping roof planes, and extended eaves that protect the space.

The influence of the *Begovina*[5] residential complex is particularly evident. Situated upstream along the Bregava River, *Begovina* composition uniquely complements Ugljen's architecture, as its elements are both adopted and reinterpreted within his design.[6]

Like *Hotel Ruža*, *Hotel Bregava* was also demolished. The destruction of this building represents yet another example of the loss of architectural memory during the transitional period. As Bernik (2002) points out, the process of post-socialist urbanization often neglects principles of spatial integration, leading to architectural interventions that lose their connection to local identity.

HOTEL IN VISOKO: ARCHITECTURE AS SCULPTURE

The town of Visoko gained its first hotel in 1974. Although Ugljen began designing *Šerefudin's White Mosque* in 1969, he considered the hotel to be his first true work, as it was completed before the mosque.[7] The Hotel in Visoko (1974; Fig. 1), though now neglected and left to decay, remains one of the city's key symbols, occupying a dominant urban position along the Bosna River. Its expressionist architectural elements reflect the medieval character of Visoko, where the building's vertical relationships connect with the historic walls and the morphology of the urban landscape. As Bernik (2002) notes: "Ugljen, as a creative seeker, did not start

5 A residential complex of approximately 2,000 square meters was built during the Ottoman occupation of Bosnia and Herzegovina under the leadership of Ali Pasha Rizvanbegovic on the left bank of the Bregava River.

6 Krzovic describes *Hotel Bregava* as an outstanding example of regionalism, successfully merging modern architecture with Herzegovinian tradition. Ugljen emphasized authenticity by using local materials and integrating ambient characteristics, making *Hotel Bregava* a model of architecture that reflects regional identity rather than adhering to universal modernist styles. (Krzovic, 1984)

Fig. 5 Project – Conceptual Design Phase, Bijela Tabija, Sarajevo

from zero; rather, he built upon the existing architectural expressiveness recognized by the profession before him." This project, together with *Šerefudin's White Mosque*, serves as an architectural manifestation of Ugljen's vision of a building as a spatial sculpture.

Ugljen's architecture is not a static reconstruction of the past but a synthesis of contemporary methodologies and traditional principles of spatial design. His projects, including *Hotel Ruža, Hotel Bregava*, and *Hotel Visoko*, represent the highest achievements of Yugoslav architecture in the 1970s, where the key element is a profound respect for both the environment and the human experience.

Recent Spatial Interventions in Zlatko Ugljen's Oeuvre

In the early 2000s, Zlatko Ugljen designed two significant projects for the city of Sarajevo, reaffirming his consistency in spatial sensitivity and critical interpretation of context. Situated on the southern slopes of Sarajevo's hills, both projects reflect Ugljen's vision of architecture as a dialogue between past and present, where contextual integration and sensitivity to place play a crucial role.

The *Bijela Tabija* project (2007; Fig. 5), which has never been realized due to unresolved property and legal issues, represents Ugljen's architectural vision for the reinterpretation of a historic site. This location holds exceptional urban and symbolic significance, as it is situated on the Vratnik Plateau, one of Sarajevo's historical foundations. Ugljen describes this space with the following words: "The plateau emerges as one of the origins of the city of Sarajevo, which makes it unique and undoubtedly gives it an epic character." (Ugljen, archive)

In his concept, Ugljen rejects literal reconstruction *(facsimile)* in favor of a layered reading of the past through architectural interpretation. His goal was not to replicate history but to create a space that evokes the spirit of place (*genius loci*; Norberg-Schulz, 1980). This methodology is reflected in his approach to:

– Combine different spatial layers – from the Roman to the Ottoman period, creating a historical narrative through architectural form.
– Integrate social and educational functions – through an open-air *lapidarium*, envisioned as a space for collective memory and the interpretation of cultural heritage.
– Design the Sarajevo Museum of Architecture – conceived as an exhibition space for architectural models of Sarajevo's most significant buildings, from the Emperor's Mosque to modernist architecture.

This approach can be analyzed through the theory of architectural semiotics[8] (Eco, 1986), where space is not merely a material entity but a carrier of cultural meanings and historical layers. In this context, Ugljen's architecture functions as an active interpreter of history rather than a passive reproducer of past forms.

On the lower plateau in the Sarajevo neighborhood of Kovači, Ugljen designed the *Administrative Building of the Riyasat of the Islamic Community in Bosnia and Herzegovina* (Fig. 6), a project that stands as one of his most significant contemporary contributions to sacred and civic architecture.

Completed in 2007, this project is characterized by three key aspects:

7 The local community, meaning most residents, initially resisted the "new" interpretation of an Islamic religious structure due to their different understanding of architectural form. However, Ugljen's departure from conventional construction and the universality of his message were eventually accepted, and the building was completed after ten years.

8 Eco explains that buildings function not only as physical structures but also as signs that convey meaning within a cultural context. He explores the concept of "functionality as communication," where architecture not only serves practical purposes but also conveys specific ideas, values, and ideologies through form, materials, and context.

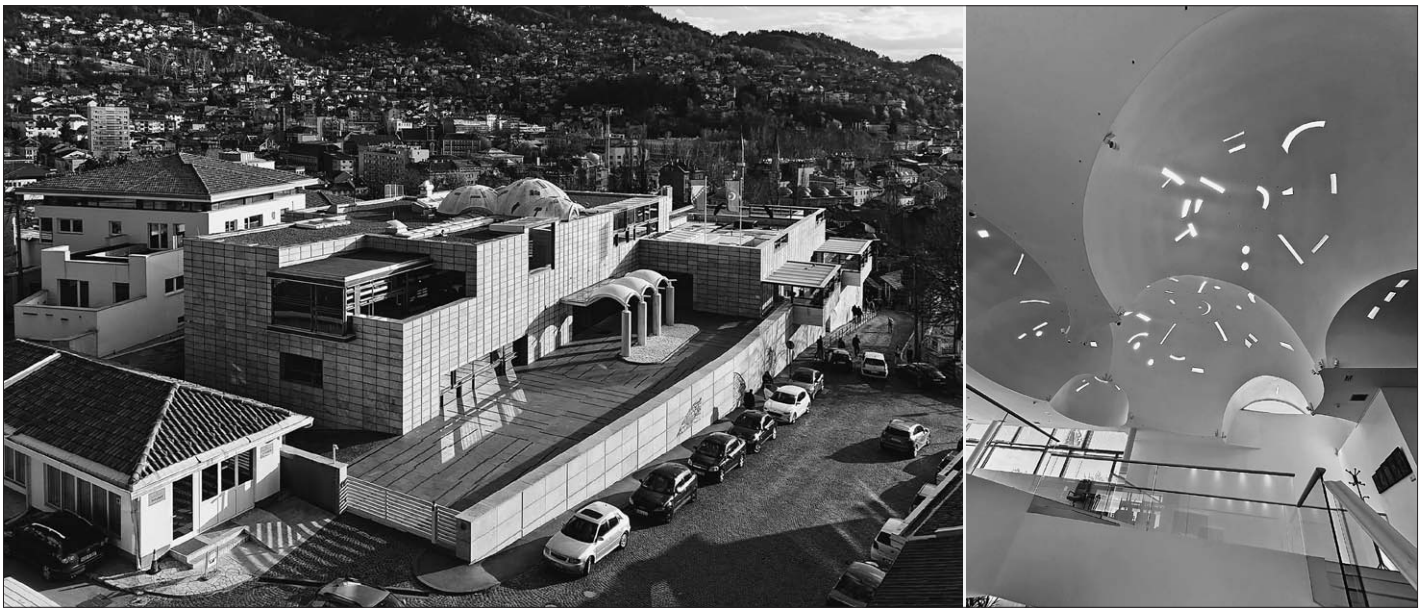

FIG. 6 ADMINISTRATIVE BUILDING OF THE RIYASAT OF THE ISLAMIC COMMUNITY IN BOSNIA AND HERZEGOVINA, SARAJEVO

– Connection to historical context – Situated near *Bijela Tabija*[9], *Žuta Tabija*[10], and *Jajce Kasarna*[11], which belong to the medieval, Ottoman, and Austro-Hungarian architectural heritage, the location enabled Ugljen to interpret architectural history through a contemporary design language.

– Symbolic and functional structure – The building's base is designed as a strong stone-clad wall, whose textured surface creates a dynamic interplay of light and shadow, evoking traditional Bosnian construction techniques. This aligns with Zumthor's theory of atmospheric architecture (Zumthor, 2006), where materiality and light shape the sensory perception of space.

– Typology of the domed space – Seven interwoven domes create the impression of a celestial vault, while light filtering through perforated star- and crescent-shaped openings symbolizes the spiritual dimension of Islamic architecture. This spatial concept resonates with the phenomenological approach to sacred architecture, whereby space becomes a site of introspection and transcendental experience.

As Ugljen states: "With its position, historical and topological characteristics, the Kovači plateau, along with the specific function of the proposed building, provides the necessary sublimation that will define the character of the structure. Encouraged by such constants, we create an architectural scene that must pulsate with a distinct identity." (Ugljen, archive, 2007).

This approach reaffirms Ugljen's ability to interpret traditional elements through a contemporary architectural language, thereby linking local identity with universal spatial values (Frampton, 1983).

Although the *Bijela Tabija* and the *Administrative Building of the Riyasat of the Islamic Community* projects differ in function and contextual specificity, both embody Ugljen's fundamental architectural message:

– Architecture as a dialogue with context – Ugljen does not imitate the past but reinterprets spatial principles through a contemporary design language.

– Materiality and light as key elements of architectural expression – Stone, light, and shadow shape the sensory perception of space. This concept relates to the transformation of the urban identity of this part of the city, deeply rooted in traditional elements[12], as reflected in form, character, and material use.

9 The White Fortress *(Bijela tabija)* is located along the Dariva-Mošćanica road, on the eastern elevation of the Sarajevo valley. Built on the site of a medieval fortress around 1550, its upper section, composed of large stone blocks, was added during the Austro-Hungarian period. The fortress played a crucial defensive role during the attacks by Austrian Prince Eugene of Savoy in the 17th century and the Austro-Hungarian military campaign of 1878.

10 The Yellow Fortress *(Žuta tabija)*, situated on the Jekovac cliff – hence also known as *Jekovačka tabija* – was one of the fortifications forming the defensive walls around the historic town of Vratnik.

11 The Jajce Barracks *(Jajce kasarna)*, located in the historical district of Vratnik, occupy a dominant position overlooking Sarajevo and are visible from nearly every point in the city. This military complex was constructed in phases, from the Austro-Hungarian period until 1948.

12 *"With its position, historical and topological characteristics, the Kovači plateau, along with the specific function of the proposed structure, provides the nec-*

Fig. 7 Interior, Šerefudin White Mosque, Visoko

Fig. 8 Interior, Church in Zabilje, Vitez

– Contextual sensitivity as a universal value
– Both projects reaffirm the continuity of Ugljen's methodology, where space serves as a medium for articulating cultural and identity narratives.

Universal Messages of Space

Universality in architecture involves the creation of spaces that transcend specific local boundaries, connecting people through shared spatial and sensory experiences. Historically, great architectural achievements such as the Parthenon in Athens, Gothic cathedrals, or Le Corbusier's Chapel of Notre Dame du Haut in Ronchamp share certain universal characteristics – the ability to simultaneously articulate aesthetics, functionality, and spirituality, creating spaces that communicate with people regardless of their cultural or religious identity.

In this context, Zlatko Ugljen conveys a universal message of space through the distinct design of sacred and public places. His works, including *Šerefudin's White Mosque* in Visoko (1970s; Fig. 7), *Our Lady of the Angels Church* in Zabilje (2009; Fig. 8), the conceptual design for the *Roman Catholic Church* in Mostar (1972), and *Kalvarija Chapel* in Vitez (2015), represent an architectural reinterpretation of sacred space. These projects are not merely responses to local needs but exemplify how architecture can serve as a bridge between different cultures and eras, articulating universal values through a distinct architectural expression.

The concept of the universality of sacred space can be analyzed through the phenomenological theory of architecture (Norberg-Schulz, 1980), which posits that sacred spaces are not merely buildings but places of heightened spatial awareness and spiritual introspection.

As Sergio Massironi notes (Thema, 2023), the universality of an architectural message does not stem solely from spatial form but also from architecture's ability to communicate universal values within a specific socio-political context. In this sense, Ugljen's architecture can be interpreted both as a critique and as an alternative to the prevailing narratives of architectural and social separatism.

The design of *Šerefudin's White Mosque* in Visoko[13] from the early 1970s represents a radical departure from the stereotypical perception of sacred space. While traditional

essary synthesis to emphasize the building's character. Inspired by such constants, we create an architectural setting that must pulsate with a personal identity. Reading the old in the spirit of creating the new is the focus of this approach. It is the foundation that guides us – a gift of heritage and a living reality that directs us to leave an architectural imprint of time, where the ever-present spirit of place is recognized." (Source: Project description, Ugljen's archive)

13 The Aga Khan Foundation Award in 1983 included a notable remark from a jury member who referred to the mosque as the *"White Flower"*: *"Full of originality and innovation (though directly indebted to Le Corbusier's chapel in Ronchamp), imbued with the architect's thought and spirit, widely shared with the community, and deeply connected to both the future and the past."* (Ugljen Ademovic, Ugljen, 2014)

Additionally, architectural critic Hugh Perman noted: *"This project stands as the only relevant example of sacred architecture from former Yugoslavia."*

The independent magazine *BH Dani* commented on the project's significance: *"Foreigners once again*

mosques structure their spatial organization along an axial alignment oriented toward the qibla, Ugljen creates a fluid, dynamic, and introspective space where light, materiality, and volumetry collectively shape the sacred atmosphere.

At the time of its construction, this project faced significant resistance, as it did not conform to the dominant modernist principles of standardization and rationality. However, with the passage of time, it can be seen as a precursor to contemporary approaches in sacred architecture, which increasingly emphasize space as an experience rather than a typological constraint.

When compared to *Our Lady of the Angels Church* in Zabilje (2009), the *Roman Catholic Church* in Mostar (1972), and *Kalvarija Chapel* in Vitez (2015), a clear continuity emerges in Ugljen's modernist expression – interwoven with regional heritage, conceptual exploration, and contemporary technology. These examples illustrate the universality of sacred space, independent of the religious affiliation of its users. Together, these projects establish architectural principles that emphasize the universality of spiritual experience – the encounter with the divine through space, light, and materiality.

Architectural form in Ugljen's projects does not conform to predefined typological patterns but is shaped by experiential and phenomenological qualities of sacred space. Materiality and light function as mediators between the physical and the spiritual, continuing the tradition of universal sacred architecture found in the works of Mies van der Rohe *(Barcelona Pavilion),* Alvar Aalto *(total design),* and Le Corbusier (*Chapel of Notre Dame du Haut* in Ronchamp).

Ugljen adopts these principles not as empty references but as reinterpretations shaped by the context, creating architecture that is not only locally grounded but also universally comprehensible.

Although his architecture transcends temporal and spatial boundaries, its universal message has not always been fully understood. Massironi (2023) highlights that the sociopolitical climate of the past thirty years has fostered an image of division rather than dialogue. Sacred architecture, in this context, could have served as a warning of what unfolded in the early 1990s – the fragmentation of social relationships and cultural identities. Sacred architecture should not be used as an instrument of separatism but as a space of universal values – harmony, respect, and continuity among different traditions, beliefs, and perceptions of the sacred.

PHYSICAL AND METAPHYSICAL EXPERIENCE

Zlatko Ugljen's architecture demonstrates an exceptional ability to shape spaces that transcend their material dimension, guiding users toward an expanded, spiritual, and human-centered experience of space.[14] This aspect is particularly evident in the designs of the *Behram-Beg Madrasa Mosque* in Tuzla (Fig. 9) and *Kalvarija Chapel* (Fig. 10), where modernist rationality intertwines with a sense of the sacred and the transcendental.

According to Christian Norberg-Schulz[15] (1980), the phenomenology of space encompasses not only the material characteristics of architecture but also the ways in which space influences human perception, experience, and emotional engagement. In this context, Ugljen employs light not merely as a functional element but as a fundamental tool for shaping the metaphysical experience of space.

The spatial composition of the *Behram-Beg Madrasa Mosque* and *Kalvarija Chapel* is carefully designed with a deliberate interplay of light, shadow, and materiality, creating a sense of spirituality that transcends the physical dimensions of architecture.

As Krzović (2005) highlights, Ugljen's technique of separating the dome from the wall through horizontal glass openings introduces the concept of transparency, allowing the interior space to open toward light. In the *Kalvarija Chapel* project, Ugljen masterfully utilizes open and closed surfaces on the façades and roof, creating a pyramidal roof structure with dynamic struts, beams, and glass elements.

The entrance to the space is not constrained by the conventional concept of a doorway – the interior remains open and freely accessible, redefining the architectural perception of entry and aligning it with a metaphysical understanding of transition from the physical to the spiritual realm. This principle can be compared to Le Corbusier's approach in *Notre*

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recognize what our own eyes remain blind to. The Šerefudin White Mosque in Visoko, the masterpiece of Bosnian architect Zlatko Ugljen, won the Aga Khan Award upon completion. A quarter of a century later, Hungarian architects declared it one of the three best-designed sacred spaces built in modern style and spirit." (*** 2007)

In Germany, Rudolf Stegers' *Atlas of Modern Architecture, Sakralbau* recognized Ugljen among the world's most significant architects of sacred structures.

14 *"This concerns the sanctity of space – if we may secularize this phrase from contemporary philosophy, which already holds different meanings for different individuals. It is about space, at the core of which is the*

Fig. 9 Mosque of the Behram-Beg Madrasa, Tuzla

Fig. 10 Kalvarija Chapel, Mošunj

Dame du Haut in Ronchamp[16], where free-form shapes and unconventional lighting effects render the sacred space fluid and intuitive (Jencks, 1984).

As Massironi (2007) emphasizes, Ugljen's architecture employs spatial symbolism not only through formal elements but also through the capacity of space to engage the senses, making the metaphysical experience an integral part of architectural form.

As Ugljen himself states: "With light and the magic of shadow, space can be shaped by synthesizing the physical and the metaphysical, constructing transcendence from the emphasis on the numinous." (Ugljen Archive). This statement clearly demonstrates that his architectural approach is not merely technical or formal but is also philosophically grounded, with the interplay of light, materiality, and spatial organization being used to evoke a sense of transcendence.

Ugljen does not treat architecture solely as a material structure but as an experiential medium, whereby space becomes a conduit for connecting users to deeper layers of perception and emotion. In this context, his sacred spaces not only reflect functional and formal innovation but also serve as places of introspection, universal experience, and spiritual connection.

Conclusion

Zlatko Ugljen's architectural work represents a synthesis of the universal and the regional, achieved through a unique dialogue between spatial context, materiality, and the interaction of users, space, and the environment. His architecture is not a result of a mere replication of tradition but rather a reinterpretation of heritage through contemporary construction methods and innovative design approaches. In doing so, he not only honors cultural and natural heritage but also creates architecture that remains relevant over time.

Ugljen's architecture is rooted in a humanistic approach, where the user is at the center of design, with a deep respect for context and environmental integration, technological innovation, and engineering solutions, as well as a subtle interpretation of the spirit of place *(genius loci)*. His projects carefully balance tradition and modern technological advancements, creating spaces that reflect both place and identity while enabling a continuous dialogue between past and present.

His architecture is not static but rather a process of interpreting and reshaping cultural memory through spatial forms. His ability to create spaces that are both universally recognizable and locally specific is a result of his

human being, for whom it is essential to create an existential environment worthy of life." (Ugljen's archive)

15 According to his ideas, the "sanctity of space" or *genius loci* arises from qualities such as light, ambiance, and the symbolic and cultural connections that space establishes with its surroundings. Norberg-Schulz argues that architecture is not merely a physical structure but a way of shaping space to foster a deeper connection with emotional and spiritual dimensions through the experience of light, texture, and symbolism. (Norberg-Schulz, 1980)

16 Jencks, in his book on postmodern architecture, discusses the Ronchamp Chapel as an example of Le Corbusier's innovation in architectural form, light, and expressive freedom. (Jencks, 1984)

profound understanding of *genius loci* – a concept that permeates all his projects. Rather than replicating traditional motifs, he embeds them within contemporary architectural languages, ensuring that each project becomes a space of dialogue between past, present, and future.

In an era where globalization often erases local specificities, Ugljen's architecture stands as proof that a balance can be achieved between contemporary architectural principles and a profound respect for cultural heritage. His projects are not isolated from international architectural currents, yet they remain deeply rooted in the cultural and natural context of their surroundings. His work serves as a guide for future generations of architects striving for sustainable, contextually sensitive architecture – one that embraces innovation while maintaining its connection to place and identity. Architecture has the power to shape not only physical space but also collective consciousness and a sense of belonging to a community.

Unfortunately, we are witnessing a time in which many of his works are disappearing, being forgotten, or neglected. In a socio-political context that often disregards the continuity of architectural heritage, Ugljen's contributions might have been more widely recognized under different circumstances. Nevertheless, his work remains a lasting reminder that architecture is not merely a physical entity but a medium of communication, dialogue, and connection. As Mile Stojic poignantly wrote in *Ruža u oluji* (A Rose in the Storm): "A sorrow too great, for beauty was created for those for whom it was never destined."

Considering Ugljen's architecture through the lens of contemporary spatial theories, sacred architecture, and critical regionalism, it becomes evident that his work belongs to a broader architectural discourse that seeks a renewed balance between modernity and tradition. In this context, it is fitting to recall Frank Lloyd Wright's thoughts from his essay *Cardboard House* (1931), in which he emphasized: "*A house is, we are inclined to believe, a noble companion to man and trees; therefore, it should possess a tranquility and texture that will quiet it as a whole and bring it into an elegant harmony with its natural surroundings. Every building intended for human needs should be elemental, a delicate feature of the terrain, complementing its natural environment and maintaining a close relationship with the ground.*"

Throughout his entire body of work, Ugljen remained committed to this very philosophy – that architecture should not be imposed but should permeate space, its spirit, and its history, creating environments where man, architecture, and nature exist in harmonious dialogue and balance.

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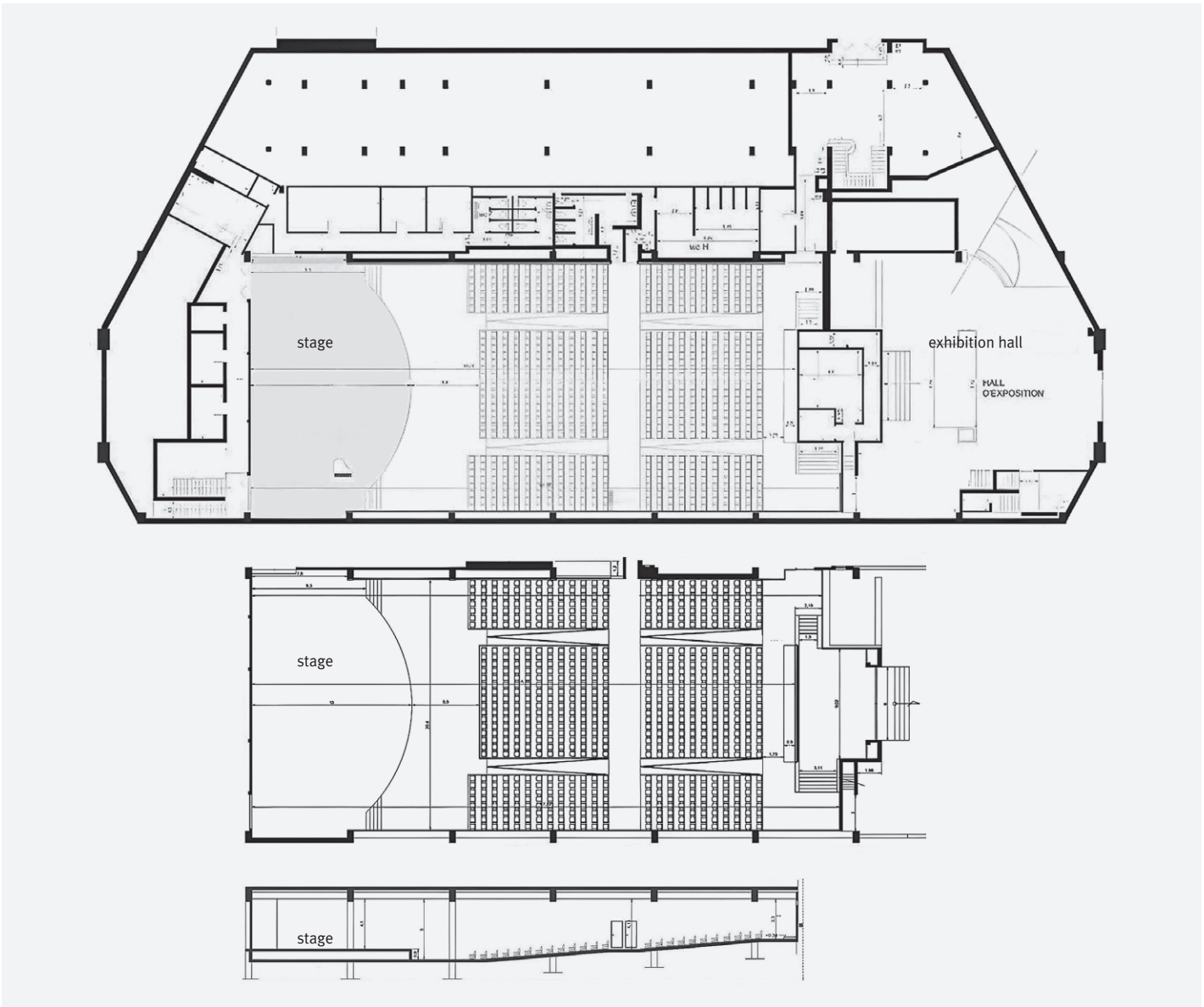

Fig. 1 Floor plans and longitudinal section of El Khalifa Cultural Center

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Reflectors Impact on Acoustic Correction of the Conference Hall at the El Khalifa Cultural Center in Constantine

acoustic quality
auditory comfort
conference rooms
El Khalifa Cultural Centre, Constantine, Algeria
plywood reflectors
sound diffusers

In Algeria, the field of acoustics has garnered limited attention from researchers, predominantly focusing on physical acoustics. Architectural acoustics, which deals with controlling auditory comfort and listening criteria within buildings, remains largely underexplored. The acoustic quality of spaces is a significant concern for physicists, architects, and researchers alike. The application of architectural acoustics in public spaces, such as conference rooms, greatly enhances the exchange of oral information and supports learning processes that require intensive verbal communication. This research aims to improve the acoustic quality of the existing conference room at the El Khalifa Cultural Centre in Constantine, Algeria. It has been noted that the centre experienced a reduction in reverberation time and sound diffusion due to an acoustic rehabilitation that introduced wall coverings of mixed panels composed of heavily perforated MDF and a layer of foam (8 cm thick). However, this rehabilitation resulted in the conference room becoming overly "deaf", diminishing its acoustic quality. In order to address this issue, we proposed the installation of a network of six plywood reflectors, each 12 mm thick, placed on the ceiling of the room in the xy plane, with dimensions of 3×2.67 m² each. Subsequently, the acoustic characteristics of the plywood reflectors were incorporated into the material database of the Olive Tree Lab Suite software to evaluate their impact on the room's acoustic performance and the quality of sound diffusion. The results for reverberation time (TR60), clarity (C80), strength (G), definition (D50), and speech transmission index (STI) were highly satisfactory and aligned perfectly with the recommended values. Therefore, the acoustic correction significantly improved the listening conditions.

Introduction

The acoustics of conference rooms is a very specific discipline that has not always integrated optimized acoustic principles, despite being in the focus of standard and relatively general studies (Farid et al., 2021). In particular, older designs and even some modern designs of these rooms do not take into account essential principles aimed at optimizing intelligibility and achieving an adequate reverberation time (Barron, 2010; Economou and Charalampous, 2016).

The reflection of surfaces in a room is crucial for the acoustic quality of space. To address this scientifically, it is necessary to define concepts that characterize diffusion and to perform corresponding measurements on sound-reflective materials. In recent years, several coefficients have been developed to measure the degree of diffusion of a surface, catering to the needs of diffuser manufacturers, room designers, and geometric acoustic modelers.

These coefficients provide a frequency-dependent measure analogous to the absorption coefficient, with two of them set to be included in international standards. However, there is a lack of publications directly comparing these coefficients, making it challenging to assess their relative merits.

Recent Research

Rindel (2001) emphasized that, alongside acoustic absorption, the diffusion of sound from surfaces plays a vital role in all aspects of room acoustics, such as in concert halls, sound studios, industrial halls, and reverberation rooms. Over a century ago, Wallace Sabine[1] intuitively recognized the importance of sound diffusion while contributing to the design of the Boston Symphony Hall. Sound diffusion can be achieved through isolated elements like columns or statues, surfaces with coarse structures such as diffusers, or through diffraction effects at the edges of panels.

Expanding on the role of reflective surfaces, Yan and Chen (2012) conducted research on high-precision reflective panels with a sandwich-type construction. These panels consisted of a coating plate and an aluminum support structure combined with a structural adhesive. The flexible skin-plate adapts well to the module, while the adhesive compensates for gaps between the skin-plate and the backup structure. The research utilized finite element method simulations (ANSYS) to analyze internal stresses and optimize processing parameters for manufacturing these high-precision panels.

Suspended reflectors, particularly in concert and audition halls, are critical for enhancing acoustic properties. Well-designed raised awnings on stage direct initial sound reflections towards the audience, ensuring equal spatial distribution of sound and improving communication among musicians. These awnings also address acoustic issues like parallel walls and excessively high ceilings. Hongisto et al. (2021) highlighted that an effective awning should allow sound reflections within a frequency range of 250 Hz to 4 kHz (ISO 3382). To cover a wider frequency range, larger panels are effective for lower frequencies, while smaller elements or modified panel shapes improve high-frequency reflections.

In this context, Szelag et al. (2020) proposed a design modification for reflective panels intended to extend the upper frequency limit of awnings without compromising the lower limit. By incorporating Schroeder diffusers on the edges of flat panels, the design maintains a large reflection area for low frequencies

1 Wallace Clement Sabine was an American physicist and Harvard professor who became known as a founder of the field of architectural acoustics. Around 1900 he was involved in designing the acoustics for Boston Music Hall (now Boston Symphony Hall), considered one of world's best concert halls for acoustics. (http://waywiser.fas.harvard.edu/people/3338/wallace-c-sabine)

while enhancing high-frequency performance through diffusion. The effectiveness of this modified design was validated through numerical simulations, mathematical modeling, and measurements. Comparative analysis demonstrated that the proposed design outperformed traditional flat or curved-edge panels.

Jo & Jeon (2022) further explored the optimization of sound diffusion in concert halls through scale-model measurements and simulations. Their study analyzed the effects of reflectors (canopies and clouds) and diffusers on both stage and auditorium acoustics. Key parameters such as stage support (STEarly and STLate), reverberation time (RT), early decay time (EDT), clarity (C80), and center time (TS) were evaluated. The results indicated that canopies reduced reverberation and increased stage support, while diffusers decreased some acoustic parameters but reduced seat-to-seat deviations. The research underscores the importance of considering both auditorium and stage acoustics and suggests placing diffusers near the sound source to optimize early reflections and achieve uniform sound distribution.

Shtrepi et al. (2017) examined the impact of distance from diffusive surfaces on acoustic parameters and sound perception in a small simulated variable-acoustics hall. Using numeric simulation software, the study evaluated two modeling approaches for diffusive surfaces to assess their influence on acoustic predictions. Parameters such as early decay time (EDT), reverberation time (T30), clarity (C80), definition (D50) (Farid Ibrir and Debache Benzagouta, 2017), and interaural cross-correlation (IACC) were analyzed. Calibration involved aligning simulation results with in-field measurements by adjusting surface absorption and scattering coefficients. The study found that diffusive surfaces significantly altered acoustic parameters, increasing EDT and T30 while reducing clarity and definition. Subjective tests showed that listeners could detect differences between reflective and diffusive conditions at distances greater than 7.5 meters. This research highlights the importance of accurate diffusion modeling in simulations to optimize both objective acoustic performance and listener experience.

Continuing this line of investigation, Shtrepi, Di Blasio and Astolfi (2020) studied the effect of diffusive surface location in performance spaces on acoustic parameters and sound perception. Conducted in a real shoebox concert hall, the study explored six configurations by varying the location of diffusive surfaces on lateral walls while keeping other surfaces absorptive or reflective. Conventional ISO 3382 acoustic parameters were measured, and results indicated minimal variation with surface location. However, subjective tests revealed that some listeners noticed differences in reverberance, coloration, and spaciousness, providing valuable insights for the strategic placement of diffusive surfaces in concert halls.

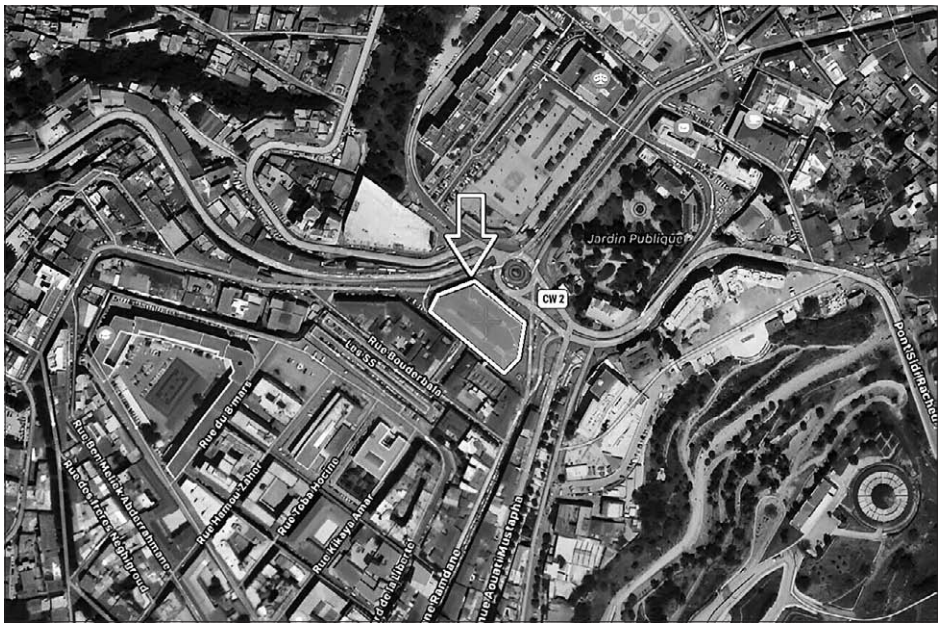


Fig. 2 Location plan of El Khalifa Cultural Center

Finally, Labia, Shtrepi and Astolfi (2020) focused on improving the acoustic quality of medium-sized meeting rooms by optimizing the configuration of sound-absorptive and sound-diffusive panels. Their study combined in-field acoustic measurements with numeric simulations to evaluate various acoustic treatment configurations. The findings showed that placing absorptive materials on the ceiling or around its perimeter, as well as on the upper parts of one lateral wall, yielded the best acoustic results. Interestingly, diffusive panels did not significantly improve conditions compared to absorptive panels alone. This research offers a practical design workflow for optimizing acoustic material placement in meeting rooms, balancing sound quality improvement with cost efficiency.

Applied Methodology

In this study, an acoustic analysis of the conference room of the El Khalifa Cultural Center was conducted using the Olive Tree Lab SUITE software (Farid, 2021). This investigation aimed to assess acoustic performance before and after rehabilitation, focusing on key parameters such as reverberation time (TR60) and intelligibility indices (C80, G, D50 and STI). The results obtained were com-

Table I Architectural and Geometric Data of the Conference Room at El Khalifa Cultural Center

1 - Surface and perimeter

Stage	Alone	Balcony	Total (floor + balcony	Surface clean audience		perimeter	Sh_f [a]
				Balcony Floor			m^{-1}
223.3	661.4		661.4	595.26		129	0.15
2 - Volumes [b] in m^3				capacity of pers.		D_{MAX} [d] (m)	
Stage	Whole room	Total	F_f [c]	Ground	Balcony	Ground	Balcony
781.55	2314.9	3096.45	3.50	704	0	23	
Geometric data							
Surface area/ person m^2				Volume / person m^3			
Net		Raw					
Ground	Balcony	Ground	Balcony	Ground	Under the balcony	Balcony	$T_{OPT-500}$ s
0.85		0.94		3.29			**0.74**

a – Shape factor (mainly the perimeter-to-area ratio).
b – Under the suspended ceiling.
c – For the considered room, the height of the room is taken as the average height, calculated as follows: total volume of the room / net area = 7.82 m.
d – The distance between the sound source (located in the middle of the stage) and the farthest listener.
e – Calculation (gross area / person × average height of the room, under the balcony or the balcony).

– **Architectural description** – The conference room at El Khalifa Cultural Center is rectangular in shape (Fig. 1). It consists of two parts: the stage and the seating area. The total area is 884.7 m^2. The total volume of the room is approximately 3096.45 m^3. The total capacity of the room is 704 spectators. Table I presents the most important architectural and geometric data of the room.

Acoustic Rehabilitation

The conference room at the El Khalifa Cultural Center underwent a specific rehabilitation operation aimed at improving its acoustic quality as well as its general condition. The rehabilitation work involved covering all the walls of the room with perforated MDF panels combined with foam (sponge) to enhance acoustic quality without altering the shape (Fig. 3).

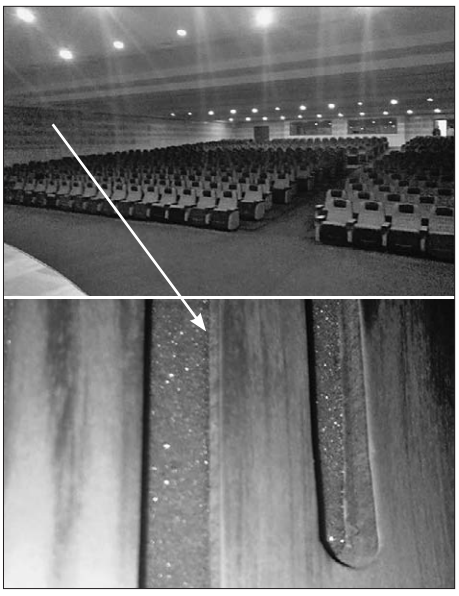
Determination of Optimal Values for Acoustic Quality Indices

Determining optimal values for acoustic quality indices in conference rooms is based on several essential criteria to ensure an optimal sound experience. Reverberation time (RT), considered the most critical acoustic criterion, ensures that speech sounds remain undistorted. According to Galbrun and Kitapci (2016), the optimal value of TR, calculated using the formula TOPT-500 = 0.3 log(V), is 0.85 seconds. Sound clarity (C80), expressed in dB, measures the ratio between the sound energy arriving in the first 80 milliseconds and that arriving thereafter, thus influencing sound perception. Likewise, the sound force (G) corresponds to the difference between the observed sound pressure level and the sound power level, also expressed in dB. The D50 index, for its part, makes it possible to assess speech clarity by analyzing the ratio between the sound energy of the first 50 milliseconds and the total impulse energy, with reference values at 500 and 1000 Hz for frequencies ranging from 63 Hz to 8,000 Hz. Finally, speech intelligibility (STI) provides an objective percentage assessment, making it possible to judge effective understanding speeches (Galbrun and Kitapci, 2016). These different indices, taken as a whole, contribute to optimal acoustics for conference spaces, validated by scientific criteria and the specialized community.

Results and Interpretation of Measurements Obtained for the Conference Room

– **Results for the TR60 Criterion** – The introduction of wall cladding with mixed panels

Fig. 3 Perforated MDF panels and foam (sponge) used for the rehabilitation of the room



pared to the optimal values prescribed by the ISO/DIS 3382-1 standards, making it possible to identify acoustic deficiencies and sound problems specific to the room. Olive Tree Lab SUITE, an advanced tool designed for acoustic simulations, provided a precise and efficient virtual environment, allowing complex acoustic scenarios to be modeled and analyzed. Suitable for professionals such as acoustics consultants, engineers and urban planners, this software helped predict noise levels, compare different configurations and ensure regulatory compliance through 3D visualizations and sound contour maps. Based on the results of the analysis, recommendations have been made to optimize the acoustic quality of the room and achieve international standards.

Architectural Analysis of the Conference Room at El Khalifa Cultural Center

El Khalifa Cultural Center is a prominent cultural venue in the heart of Constantine, located on Place du 1er Novembre 1954 (formerly La Brèche; Fig. 2). The former Citroën garage, built during the colonial period in 1933, was converted into a cultural center in 1980. Like the Malek Hadad Cultural Palace, El Khalifa Cultural Center underwent a rehabilitation operation in 2014, initiated as part of the event "Constantine, Capital of Arab Culture 2015" by the Nasri Salim design office. The building includes several offices, two conference rooms, a library, and a performance hall, as well as an honors lounge reserved for welcoming city guests (Fig. 1 up).

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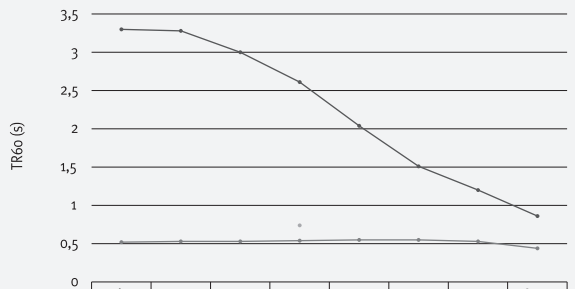
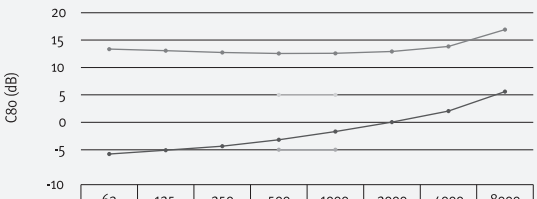


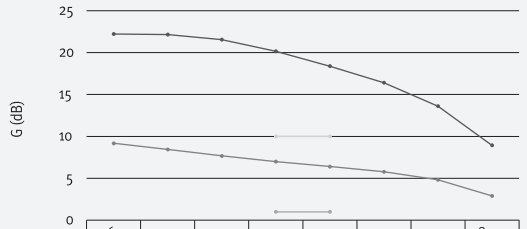
frequency (Hz)	63	125	250	500	1000	2000	4000	8000
Tr60 before rehabilitation	3,3	3,28	3	2,61	2,04	1,51	1,2	0,86
Tr60 after rehabilitation	0,52	0,53	0,53	0,54	0,55	0,55	0,53	0,44
optimal TR60				0,74				

5



frequency (Hz)	63	125	250	500	1000	2000	4000	8000
corrected C80	-5,79	-5,08	-4,36	-3,19	-1,67	0,04	2,06	5,62
current C80	13,36	13,08	12,75	12,56	12,59	12,93	13,86	16,94
Minmum C80 according to ISO/DIS 3382-1				-5	-5			

6



frequency (Hz)	63	125	250	500	1000	2000	4000	8000
G before rehabilitation	22,23	22,16	21,55	20,16	18,39	16,41	13,61	8,93
G after rehabilitation	9,18	8,45	7,68	7	6,4	5,78	4,83	2,9
Minmum G according to ISO/DIS 3382-1				1	1			
Maximum G according to ISO/DIS 3382-1				10	10			

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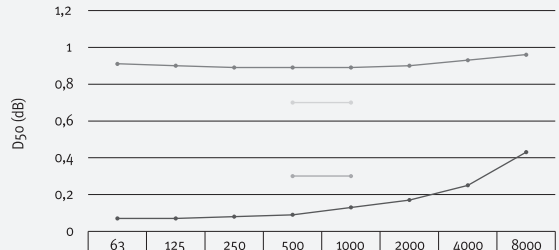


frequency (Hz)	63	125	250	500	1000	2000	4000	8000
D50 before rehabilitation	0,07	0,07	0,08	0,09	0,13	0,17	0,25	0,43
D50 after rehabilitation	0,91	0,9	0,89	0,89	0,89	0,9	0,93	0,96
Minimum D50 according ISO/DIS 3382-1				0,3	0,3			
Maximum D50 according ISO/DIS 3382-1				0,7	0,7			

composed of heavily perforated MDF and a layer of foam (thickness 8 cm) significantly reduced the reverberation time values across all frequencies. The reduction after the rehabilitation work is estimated at -84% for the 125 Hz frequency, -73% for the 1000 Hz frequency, and -44% for the 4000 Hz frequency. Comparing the reverberation time after rehabilitation with the optimal reverberation time shows that Tr60500, which was 0.54 s, decreased, compared to the optimal Tr60500 value of 0.74 s. This makes the room acoustically dead, significantly reducing its acoustic quality (Fig. 4).

– **Results for the C80 Criterion** – It can be observed from these results that the acoustic rehabilitation influenced the values of the C80 spectrum. It produced an increase in the level, ranging from 19 dB for the 63 Hz frequency to 11 dB for the 8000 Hz frequency. It is important to note that the C80 index values after rehabilitation do not fall within the optimal range (Fig. 5).

– **Results for the G Criterion** – The rehabilitation had a significant impact on the energy strength G, with an average decrease of -13 dB, which is particularly notable in acoustics. According to ISO 3382, the optimal values of the G index fall within the range of -2 to 10 dB for frequencies of 500 Hz and 1000 Hz. Comparing the G strength values after rehabilitation with these optimal values, it is evident that the rehabilitation has considerably improved the G indices (see Fig. 6). This improvement demonstrates the effectiveness of the interventions carried out, aligning the room's acoustic performance with the recommended standards.

– **Results for the D50 Criterion** – The value of D50 is 0.90 across all frequencies, indicating a significant increase of 0.84 dB after the rehabilitation work. However, it is important to note that these D50 values have exceeded the optimal range defined for this index (see Fig. 7).

– **STI Intelligibility Criterion** – The final STI intelligibility index improved from a very poor state to a good state (Table II).

Fig. 4 Comparison between TR60 before rehabilitation, TR60 after rehabilitation, and the optimal TR60

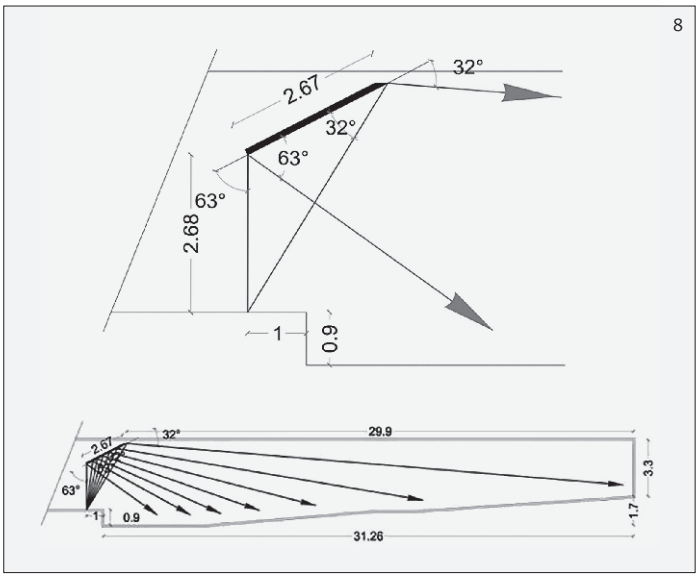
Fig. 5 Comparison between C80 before rehabilitation, C80 after rehabilitation, and the optimal C80

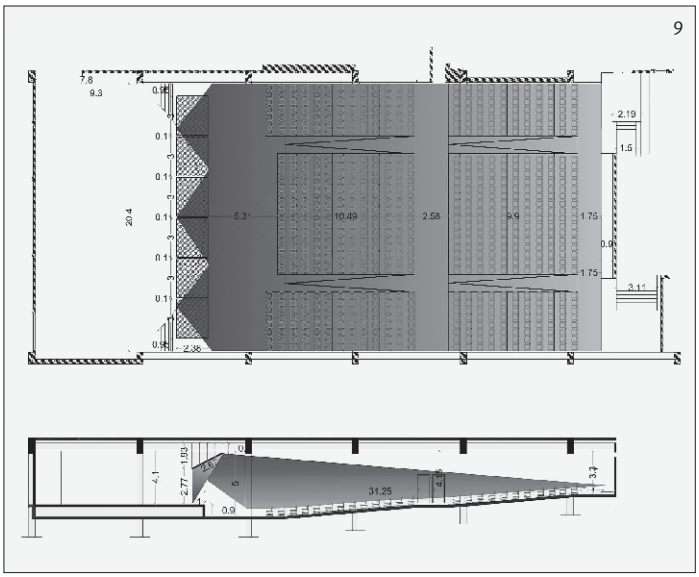
Fig. 6 Comparison between G before rehabilitation, G after rehabilitation, and the optimal G

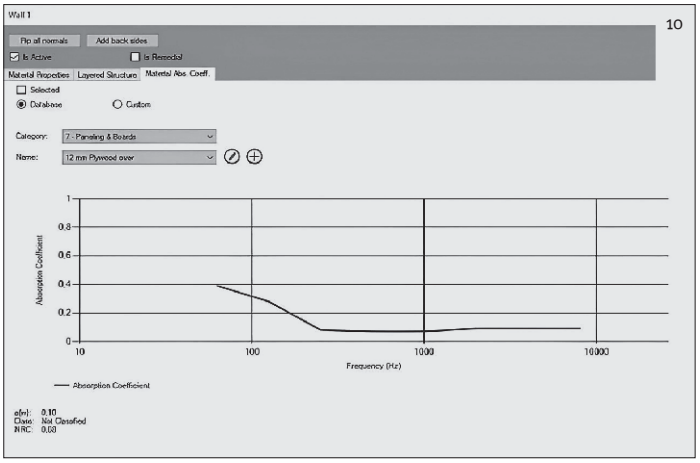
Fig. 7 Comparison between D50 before rehabilitation, D50 after rehabilitation, and the optimal D50

Table II Comparison of STI before rehabilitation, STI after rehabilitation, and optimal STI

	STI before rehabilitation	STI after rehabilitation	optimal STI according to ISO/DIS 3382-1
STI	0.38 very bad state	0.66 good condition	0 to 0.30 very bad 0.30 to 0.45 bad 0.45 to 0.60 satisfactory 0.60 to 0.75 good 0.75 to 1 very good







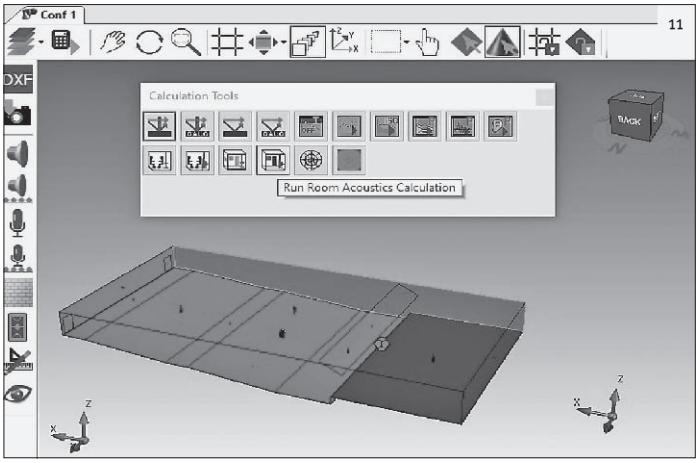


Fig. 8 Position of the reflectors on the section

Fig. 9 Direct and indirect sound field after the insertion of reflectors

Fig. 10 Introduction of the acoustic characteristics of reflectors into the software program

Fig. 11 Acoustic simulation on Olive Tree Lab

Proposed Corrections

– **Application of reflectors** – For better sound diffusion and improved acoustic quality in the conference room at El Khalifa, we opted to insert reflective plywood surfaces on the ceiling. Several calculations were made to identify the number of reflectors and their dimensions to ensure the sound reaches all the audience members. A network of six plywood reflectors, 12 mm thick, is placed on the ceiling of the room on the xy plane, each with a dimension of 3×2.67 m². The projection of the geometric reflection point on the plane is represented as shown in the section (Fig. 8).

The reflection angle for the lowest point of the reflectors is 63°, which reaches the first row of the audience. The highest point has an angle of 32°, which reaches the last row of the audience (Rindel, 2004). The direct and indirect sound fields after the insertion of reflectors are shown in the figure below (Fig. 9).

– **Modeling and simulation** – We introduced the acoustic characteristics of the plywood reflectors into the material database of the Olive Tree Lab Suite software (Fig. 10) to evaluate the impact of these reflectors on the acoustic performance of the room and the quality of sound diffusers (Fig. 11).

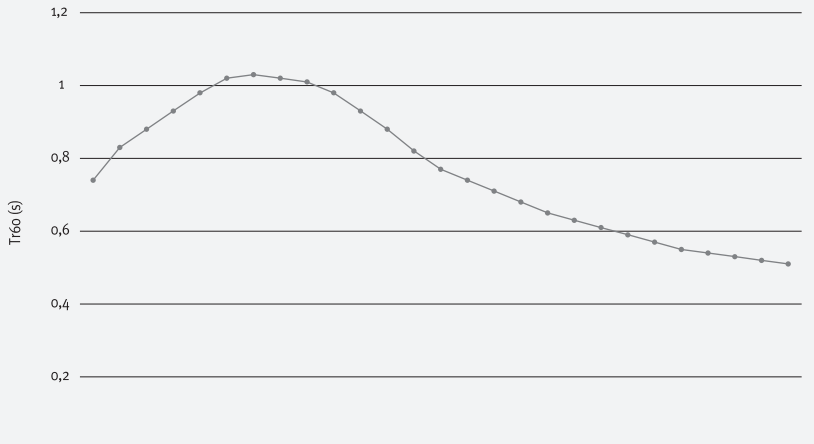
Table III The STI values after correction, compared with the current STI and the optimal STI

Indication	Current State	After Correction	Optimal Values
STI	0.67 on the STI scale – the quality is good	0.87 on the STI scale – the quality is very good	from 0 to 0.30 – very poor from 0.30 to 0.45 – poor from 0.45 to 0.60 – satisfactory from 0.60 to 0.75 – good from 0.75 to 1 – very good

Results and Interpretation

The results for the reverberation time TR60, clarity C80, strength G, D50, and speech transmission index (STI) were highly satisfac-

12



	25	31,5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
TR60 values after correction	0,74	0,83	0,88	0,93	0,98	1,02	1,03	1,02	1,01	0,98	0,93	0,88	0,82	0,77	0,74	0,71	0,68	0,65	0,63	0,61	0,59	0,57	0,55	0,54	0,53	0,52	0,51

Fig. 12 TR60 values after correction

Fig. 13 Comparison between the corrected TR60, the current TR60, and the optimal TR60

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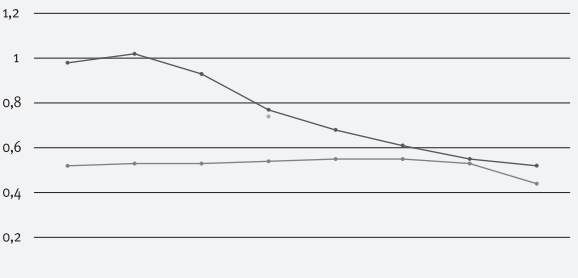
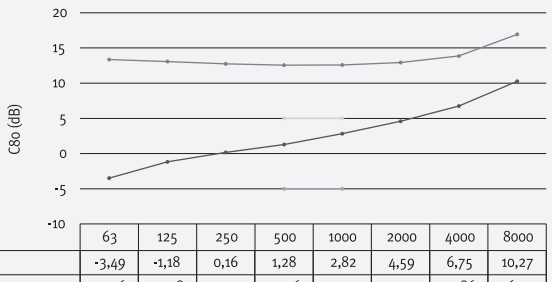


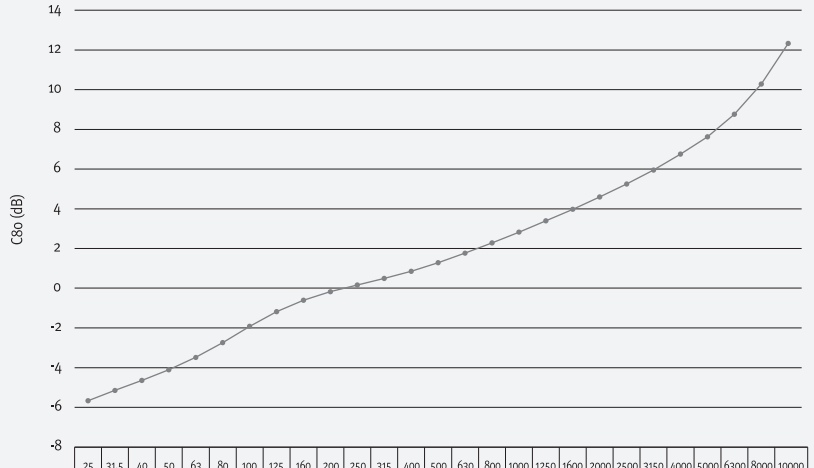
frequency (Hz)	63	125	250	500	1000	2000	4000	8000
corrected TR60	0,98	1,02	0,93	0,77	0,68	0,61	0,55	0,52
current TR60	0,52	0,53	0,53	0,54	0,55	0,55	0,53	0,44
optimal TR60				0,74				

14



frequency (Hz)	63	125	250	500	1000	2000	4000	8000
corrected C80	-3,49	-1,18	0,16	1,28	2,82	4,59	6,75	10,27
current C80	13,36	13,08	12,75	12,56	12,59	12,93	13,86	16,94
Minmum C80 according to ISO/DIS 3382-1				-5	-5			
Maximum C80 according to ISO/DIS 3382-1				5	5			

15



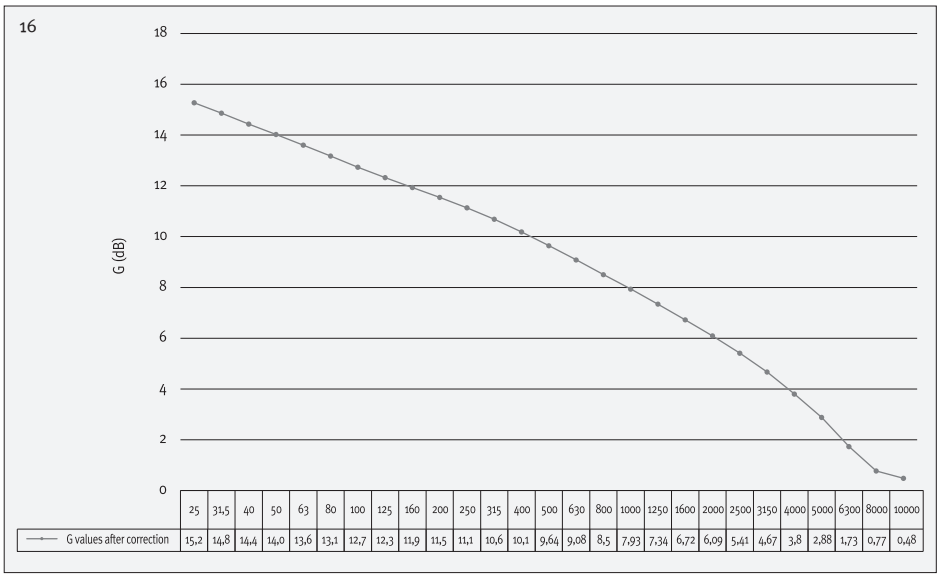
	25	31,5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
C80 values after correction	-5,6	-5,1	-4,6	-4,1	-3,4	-2,7	-1,9	-1,1	-0,6	-0,1	0,16	0,49	0,85	1,28	1,76	2,28	2,82	3,39	3,97	4,59	5,24	5,94	6,75	7,62	8,75	10,2	12,3

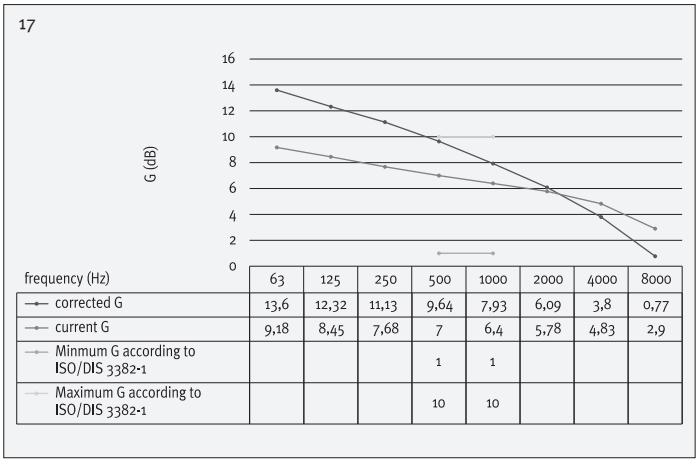
Fig. 14 Comparison between the corrected C80, the current C80, and the optimal C80

Fig. 15 C80 values after correction

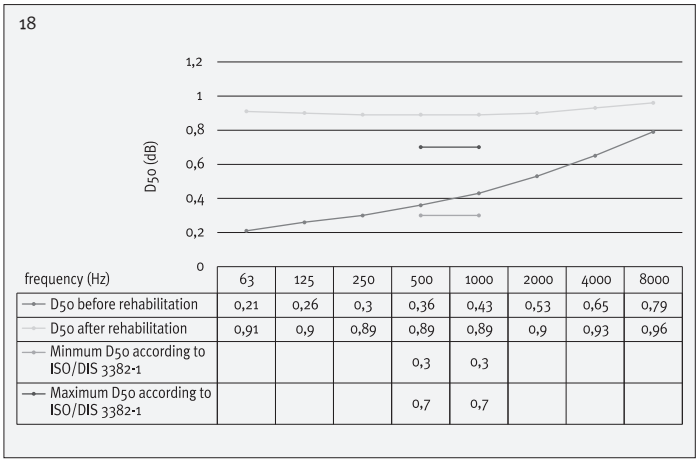
Fig. 16 G values after correction

Fig. 17 Comparison between the corrected G, the current G, and the optimal G





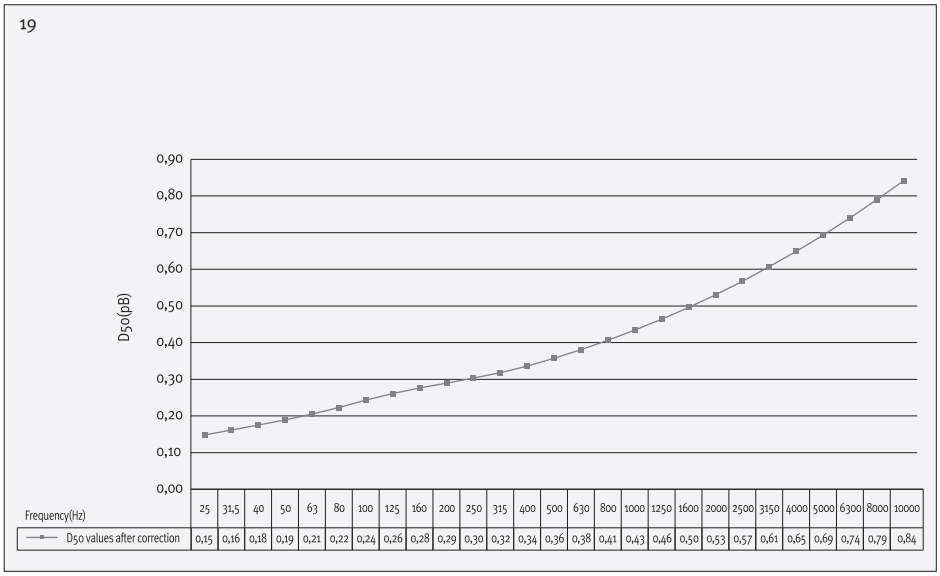
frequency (Hz)	63	125	250	500	1000	2000	4000	8000
corrected G	13,6	12,32	11,13	9,64	7,93	6,09	3,8	0,77
current G	9,18	8,45	7,68	7	6,4	5,78	4,83	2,9
Minmum G according to ISO/DIS 3382-1				1	1			
Maximum G according to ISO/DIS 3382-1				10	10			



frequency (Hz)	63	125	250	500	1000	2000	4000	8000
D50 before rehabilitation	0,21	0,26	0,3	0,36	0,43	0,53	0,65	0,79
D50 after rehabilitation	0,91	0,9	0,89	0,89	0,89	0,9	0,93	0,96
Minmum D50 according to ISO/DIS 3382-1				0,3	0,3			
Maximum D50 according to ISO/DIS 3382-1				0,7	0,7			

Fig. 18 Comparison between the corrected D50, the current D50, and the optimal D50

Fig. 19 D50 values after correction



tory. In Figures 12-19 the nominal TR60 value is 0.77 seconds, which is perfectly compatible with the recommended value of 0.74 seconds. In Fig. 14 the C80 values fall within the standard margin, and the same is true for the other indices: G (Figs. 16 and 17), D50 (Fig. 19), and STI (Table III).

Overall, the results for the various acoustic criteria are very satisfactory. We can conclude that our correction strategy yielded good results. It is noteworthy that the correction significantly improved the listening conditions.

Conclusion

The acoustic simulation conducted on various indices allowed for a detailed acoustic diagnosis of the studied conference hall. This analysis revealed that despite the improvement in acoustic conditions following the rehabilitation work, the hall still exhibits notable acoustic problems and deficiencies. The results indicated a reduction in reverberation time below the optimal threshold, which significantly reduced sound diffusion and, consequently, the acoustic quality of the hall. This reduction in reverberation time compromises the clarity and intelligibility of speeches. To remedy this problem, we introduced reflectors in strategic locations. The simulation results showed that the proposed modifications to the acoustic corrections were largely significant.

These results provide a valuable basis for guiding our methodological approach. They allow us to propose solutions aimed at improving the listening quality in the studied conference hall. Furthermore, these results will guide us in developing a comprehensive strategy to generalize the recommended solutions to all similar conference halls, in order to optimize their acoustic performance.

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Illustration sources

Fig. 1	BET Nasri Salim
Fig. 2	Google Earth, 2023
Fig. 3	Authors 2019
Figs. 4-19	Olive Tree Lab Suite software, 2019
Tables I-III	Authors, 2024

Authors' biographies and contributions

Dr. **Dalal Farid** is a senior lecturer at the Larbi Ben Mhidi University, specializes in acoustic correction with ecological materials. She holds a Ph.D. from the University Constantine 3 and is a member of the LAGED Laboratory.

Dr. **Amina Naidja** is a senior lecturer (A) at Larbi Ben Mhidi University. She focuses on bioclimatic design and building sciences. She holds a Ph.D. from the University Constantine 3 and contributes to research at the ABE Laboratory.

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Leading role: D.F.; conceptualization: D.F. and A.N.; methodology: D.F. and A.N.; software: D.F. and K.Z.; validation: A.N.; formal analysis: D.F. and A.N.; investigation: D.F.; resources management: D.F. and K.Z.; data curation: D.F., A.D. and K.Z.; writing – original draft preparation: D.F.; writing – review and editing: D.F., A.N. and Y.N.B.; visualization: D.F., A.N. and K.Z.; supervision: D.F.; project administration: D.F.; funding acquisition: D.F. and A.N. All authors have read and agreed to the published version of the manuscript.

Book reviews

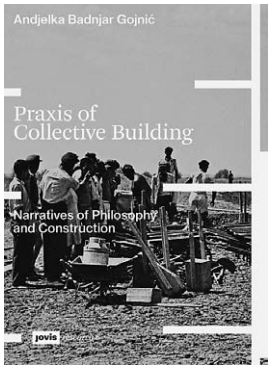
Summaries of doctoral dissertations

Tajana Jaklenec

Praxis of Collective Building – Narratives of Philosophy and Construction

Praksa kolektivnog građenja – narativi filozofije i građenja

Anđelka Badnjar Gojnić



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The book *Praxis of Collective Building: Narratives of Philosophy and Construction* marks the first application of Yugoslav praxis philosophy to the study of architectural and construction practices. It opens a new perspective connecting philosophical discourse with practical building processes and sheds light on the socio-political dimensions of post-war reconstruction and housing shortages.

New Belgrade, the main case study of the book, remains the best example of a fully functioning socialist utopia and of the interplay between city-making, state-building, and *praxis* philosophy, illustrating the relationship between theory and practice. Anđelka Badnjar Gojnić explores how the building process in New Belgrade provides a deeper understanding of social theories. Using philosophy to analyse architecture within a broader political and social context, the author offers insight into the collective nature and efforts of postwar construction.

Architectural studies still lag in active exchange with social theories, raising the question of how construction can serve as a medium for deepening our understanding of these theories within architecture. Building processes can contribute to this understanding by offering a canvas for interpreting social theories. This book, therefore, provides a platform for critically revisiting Marxist theorists – such as Gajo Petrović, Rudi Supek, Henry Lefebvre, Cornelius Castoriadis, and Ernst Bloch – as well as Jürgen Habermas, in relation to architecture. By doing so, it examines how this interdisciplinary approach functions as a methodological tool. The author Badnjar Gojić transcodes their theories into architecture, employing methods of simplification, analytics, interpretation, articulation of archival material, and finding analogies for the concepts of social eidos, fragmentary knowledge, institution, and cultural memory.

The book contends that construction is not merely a technical process but also a philosophical and collective act through which social formations are shaped. *Praxis* serves as the central concept linking all the chapters, each of which explores a specific philosophical interpretation of praxis relevant to our reflections on construction. As a methodological approach, praxis bridges theory and practical engagement, prompting the question of whether narratives can illustrate the validity of applying theoretical ideas to architectural practice. The author's micro-historical approach seeks to reconcile theoretical inquiry with *praxis* philosophy by closely examining construction microhistories. Theoretical issues of collective production are examined through various narratives, including voluntary youth labor in the construction of New Belgrade from a Marxian praxis perspective, participatory prefabrication as a response to housing shortages in Yugoslavia, and the transfer and adaptation of the Yugoslav IMS prefabrication system to Cuba via the microbrigade movement.

The book is structured around three narratives: *praxis and action*, *praxis and imagination*, and *praxis and Lebenswelt*. The case studies follow two parallel trajectories: one tracing the development of praxis philosophy in Yugoslavia and internationally during the second half of the twentieth century – particularly through the Praxis journal – and the other examining construction episodes beginning in Yugoslavia and eventually extending to the Global South.

The opening chapter outlines the connection between the Marxian view of praxis as socially engaged labour and the initiative of collective construction, which is closely tied to youth voluntary work movements. These narratives provide a conceptual framework for understanding how, in the early post-war period, extensive construction endeavours mobilized youth, thereby integrating social and political ideologies into the tangible process of building.

The second chapter, framed by Castoriadis's and Bloch's concepts of imagination, explores how material production in the country was intertwined with social imagination. Institutions such as the Institute for Materials Testing (IMS) – a place for cooperation in building and a self-governed enterprise – used New Belgrade as a testing field for innovative construction practices. The evolution of these practices led to the rise of prefabrication, which addressed housing shortages while introducing new forms of participatory architecture. Prefabrication was seen as a solution to the housing crisis, fostering a collective effort to formalize and advance construction methods. The chapter focuses on how an open system was produced and tested as a part of a collective effort.

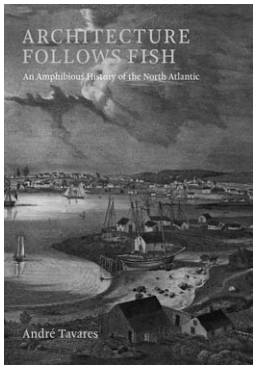
In both chapters, Badnjar Gojic argues that housing, as a part of social modernisation, was crafted in Yugoslavia through the imaginative engagement of material production. This was possible due to the historical setup: an active philosophical scene, the postwar need for reconstruction, and the shift towards a self-governed economy.

Finally, the chapter on *praxis and Lebenswelt* delves into the transfer of knowledge to Cuba, emphasising how construction sites actively engaged with and transformed the lived experience *(Lebenswelt as coined by Habermas)* of their participants. The system imported from Yugoslavia made it possible to create this *praxis* in the everyday life of the brigade due to the cultural exchange that took place. This exchange established a link between the material *praxis* that emerged in Yugoslavia to build housing and the new reality in Cuba. The prefabricated construction model served as a foundational framework for the emergence of urban agriculture, a distinctive Cuban phenomenon that gained prominence during the 1990s.

The methodological approach of this book offers valuable insights at the intersection of philosophy, social theory, and architecture, framing construction as both a material and conceptual practice. By bridging abstract theory with the concrete realities of building, it demonstrates how architecture can serve as a medium for interpreting and enacting social thought. When such research would incorporate digital tools like Obsidian or NVivo, it would further reinforce this bridge – enabling the mapping of relationships between actors, ideologies, and events in ways that expand the book's praxis-based methodology. These tools not only support theoretical inquiry but also deepen its practical application, offering a model for future interdisciplinary research.

Marija Barović

Architecture Follows Fish
An Amphibious History of the North Atlantic



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288 pages, 128 b&w illustrations
[25/17 cm, Hardcover]

ISBN 978-0-262-04910-8

André Tavares

"There is no apparent difference between brick and fish, between geological and biological elements, as if the extraordinary structure was actually built of herring." This striking comparison captures the tone of the book *Architecture Follows Fish: An Amphibious History of the North Atlantic*, in which architect and author André Tavares explores how fishing practices shaped architecture across the North Atlantic from the early modern period to the late twentieth century.

Although authored by an architect, the book does not focus on architecture as a designed object. Instead, Tavares conceptualizes architecture as the material outcome of human practices embedded in natural systems. This perspective moves beyond the professional notion of architecture as the architect's act of designing a building, shifting the research toward a methodology grounded in environmental history – one that enables the analysis of the social and ecological relationships shaping the built environment. In this, Tavares joins a growing field within architectural historiography that reconsiders the past through environmental and ecological lenses, to critically examine architecture's entanglements with environmental degradation on a planetary scale.

Although authored by an architect, the book does not focus on architecture as a designed object. Instead, Tavares conceptualizes architecture as the material outcome of human practices within the natural systems. This perspective moves beyond the professional notion of architecture as the architect's act of designing a building, shifting the research toward a methodology grounded in environmental history – one that enables the analysis of the social and ecological relationships shaping the built environment.

Fishing and fish-processing practices exemplify a form of human activity that relies on the sea while simultaneously shaping the land. On this basis, Tavares coins the term *fishing architecture*, a concept that bridges land and sea into a unified amphibious logic. This logic is mediated by marine ecologies and human extractive practices. The former is defined by the biological traits and behaviors of fish, while the latter builds on these logics to shape naval and terrestrial structures to scale the resource extraction.

Tavares examines multiple fish species to show how their biological characteristics have given rise to distinct architectural forms. Sardine canneries, herring smokehouses and cod-freezing plants all exemplify how different species drive specific technological and spatial responses.

The architectural forms that shape coastal fishing landscapes often exhibit a simple and modest character which is frequently associated with vernacular architecture. The image of the vernacular was famously articulated by Bernard Rudofsky through his notion of *non-pedigreed* architecture. While Rudofsky's photographic representation of *architecture without architects* celebrated the anonymous nature of such forms, Sigfried Giedion offered a technological reading in *Mechanization Takes Command*, where he examined the spatial logic of slaughterhouses through the relationship between animals and systems of meat production. Building on these perspectives, Tavares's analysis highlights the destructive impact of fishing structures on marine ecosystems, adding a critical ecological dimension to the understanding of the vernacular. In doing so, he cautions against romanticizing these forms, as idealized views of vernacular architecture or idealized national architectural histories can obscure the complex ecological, technological, and cultural entanglements that define them.

Tavares uses both the ocean and the fish as agents to challenge anthropocentric narratives. By bringing together diverse examples of fishing architecture from across the North Atlantic, the book constructs a *pan-Atlantic* architectural history. As marine species that do not recognize national boundaries, fish become tools for transcending the territorial logic of nation-states. On a world map where the ocean's zones are divided by geopolitical and economic interests, the fish perspective reveals hidden interactions between sea and land. By uncovering these, Tavares encourages us to see the ocean not merely as a resource but as a spatial agent that shapes everything from fishing gear to processing infrastructures and food systems.

Throughout the book's five chapters, Tavares guides us through the biological dimensions of the ocean, the technological development of fishing, the land-based fish infrastructure, the political dynamics of resource extraction and the cultural significance of dietary practices. Tackling these specific biological and technological histories across vast geographies requires moving beyond the disciplinary boundaries of architectural knowledge. Tavares does this through his research project *Fishing Architecture*, which brings together marine biologists, underwater archaeologists, historians, and architects. I encountered the productive framework of this interdisciplinary exchange firsthand as a guest presenter at the project's 2024 gathering in Portugal, where I shared my doctoral research on socio-spatial systems formed around sardine canneries in the Eastern Adriatic. The interdisciplinary character of the *Fishing Architecture* project echoes the collaborative research methodology of influential anthropologist Anna Tsing, whose work on global commodity networks of the matsutake mushroom traces the fragile and uneven entanglements between humans and nonhumans. Like Tsing, Tavares weaves fragile, fragmented, yet interconnected narratives across the vast geographic area.

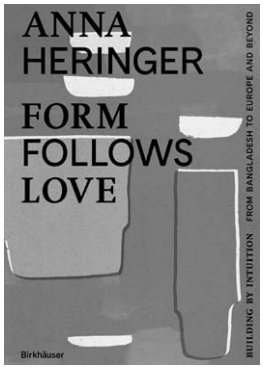
The book's global scope moves across geographies – from Norway to Newfoundland, Brittany to the Azores – but offers more than historical insight. Through the lens of the fish, Tavares interrogates architecture's role in the global environmental degradation, technological shifts and changing cultural patterns, offering a framework for reflecting on contemporary ecological crises that transcend national borders. Just as Tavares integrates diverse perspectives, his book will appeal to a wide readership. For architectural professionals and scholars, it provides a compelling case study and a methodological framework that addresses the entanglements of architecture, seeking more integrated, relational understandings of the world we build and inhabit.

Tajana Jaklenec

Form Follows Love
Building by Intuition – from Bangladesh to Europe and Beyond

Forma slijedi ljubav
Građenje intuicijom – od Bangladeša do Europe i dalje

Anna Heringer, Dominique Gauzin-Müller



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Form Follows Love is a conversation between architect Anna Heringer and critic Dominique Gauzin-Müller that explores Heringer's practice, philosophy, and experiences across the Global South and North. The book presents not only built projects but also a worldview where sustainability, community, and creativity shape design. Heringer stresses that beauty in architecture has nothing to do with money but everything with creativity and love – a perspective resonating strongly with today's values as shown by her packed talks, prestigious awards such as The Aga Khan Award (2007) and The OBEL Award (2020), as well as exhibitions at MoMA, MAM and Venice Biennale.

We first became acquainted with the work of Anna Heringer in 2007 through a series of guest lectures titled "Beyond the Focus: Architecture of Giving". These two seasons' lectures were held at the Faculty of Architecture in Zagreb, which was organised by ARHIsquad, an association of architecture students focused on socially engaged architecture. The paradigm of socially engaged architecture that Arhisquad aimed to present was particularly prominent at the beginning of the 2000s. The works of Anna Heringer and Eike Roswag, alongside Francis Kéré, Jason Coomes from Rural Studio, Emilio Caravatti, Jean-Philippe Vassal, and Peter Fattinger, were evident. They formed a group that offered a different perspective on the world and an alternative approach to architecture.

Nearly 18 years later, Heringer continues to nurture a deep sensitivity for such architecture, having expanded her practice into many realms: she produces her own *Dipdii Textiles*, has taught as guest lecturer at prestigious institutions including Harvard, and develops projects for local communities that positively impact the environment and society by valuing local potentials, materials, and knowledge. Her commitment to socially engaged architecture is influenced by her parents, who raised her with a strong awareness of environmental issues and through experiences in scout camps in the wilderness, as we find out in the first chapter on early inspirations. Her first and most significant building project was realised at the age of 19 in Bangladesh, and its success and ingenuity testify to the values instilled in her upbringing and the project itself.

The central theme of her architecture – and of this book – is how architecture can have a positive impact on the environment and society. The narrative moves through her formative experiences in Bangladesh, the transfer of that knowledge to Europe, and the expansion of her practice into other spheres such as textile design, education, participatory installations, and activism. Throughout these phases, Heringer consistently builds what can be described as an architecture of love – one not focused on profit or spectacle, but on people, the environment, and collaboration. Her work demonstrates how architecture can positively impact both the environment and society by building with local resources to maintain ecological balance. She skilfully employs and amplifies centuries-old reclaim-reuse-recycle principles and strategies that are an integral part of Bangladesh's building culture.

The second chapter focuses on Heringer's formative experience in Bangladesh. During this period, she built several key projects: the Aga Khan-awarded METI School, the DESI Centre for electricians, where modern sanitary units were built in an earth house for the first time, homemade farmhouses for farming families, where two-story mud structures were tested to preserve agricultural land for food production, and Chwitter Sustainability Training Centre, where the claystorming design process was used. Claystorming is an innovative method that she developed with Martin Rauch, a pioneer in building with earth. This method is like a three-dimensional sketch, in which you get your hands on a big chunk of clay and start to work with it in a fast and intuitive way – testing all sorts of forms and scales, constantly reshaping the clay. In all these projects, knowledge durability mattered more than material durability. Architecture for development means leaving the knowledge behind instead of waste. Just as the ability to let go. When Heringer had to replace the bamboo elements of the school, the local community accepted this intervention without resistance, informed by a Hindu cultural framework that embraces the concept of impermanence – the capacity to let go as an integral part of continuity and renewal.

The third chapter focuses on the transfer of knowledge from the Global South to Europe.

Heringer's main concern is that norms, standards, and certifications limit the sustainability she aspires to. She argues that it is precisely these regulations that prevent designing in truly sustainable ways, since there is no ethical justification for building differently in parts of the world where wealth makes any kind of resource accessible. The root of the problem, she believes, is fear – fear of impermanence, scarcity, personal limitation, mistakes, and, ultimately, fear of taking responsibility. This tension between rigid regulation and sustainable innovation is not unique to her work; architects worldwide face similar challenges. As Shigeru Ban points out, "Everywhere, people are happy when there's no clear standard for a particular type of structure, material, or construction detail. These gaps are happily exploited."

All projects presented in the book demonstrated the possibilities of building with natural materials using simple methods that continue local traditions, improve living standards, and maintain sustainability, inclusiveness, and intuitive design. Heringer does not abandon these principles in the Global North, nor does she accept the limitations imposed by regulatory systems. She does not conform to conventional boundaries of architectural practice, nor does she allow legal constraints to dictate the scope of her work.

The paradigm of socially engaged architecture has, over time, evolved into what may now be understood as an architecture of love. This practice constructs not only physical space but also cultivates human connection, community, and resilience. Projects rooted in such values are likely to shape the foundations of a future architectural era – one that prioritises sustainability, localised knowledge, environmental awareness, and participatory processes – all of which are more necessary now than ever.

Ivana Krmpotić Romić

Architectural and Urbanistic Criteria for the Integration of Temporary Urban Interventions in Public Spaces

Arhitektonsko-urbanistički kriteriji za integraciju privremenih urbanih zahvata u javni prostor

Ivana Krmpotic Romic (1991), M.Sc.Arch., teaching assistant at the Department of Architectural Design at the Faculty of Architecture, University of Zagreb. She participates in architectural competitions, and collaborates in architectural projects, exhibitions and publications.

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Date of public defence: December 16, 2024

The dissertation has 192 pages of the main text, 78 pages of research catalogue units, 96 bibl. units, 9 chapters, 2 illustrations, 33 tables, and 15 footnotes.

The doctoral thesis examines the process of integrating temporary urban interventions into public spaces in cities. This process is perceived as the interrelation between the compatibility of the status of the existing public space and the impact of the temporary urban intervention, with both elements realising their maximum potential. Nowadays, when temporary urban interventions have become a prevalent and easily accessible tool for economic, market, and institutional presentation, the research problem is manifested in the lack of guidelines in the design and selection of locations for temporary urban interventions, and in the absence of criteria for their integration within the field of professional and scientific literature.

The subject of this research is to determine the compatibility features of temporary urban interventions and public space, conditioning the integration of temporary urban interventions into public space. The results of the research are presented through 3 main research chapters.

The first part of the research resulted in the criteria that define the status of public spaces and affect their capacity to accommodate specific types of temporary urban interventions. The research was conducted trough an analysis of 25 examples of existing public spaces before and independently of the placement of temporary urban interventions in order to determine their capacity to accommodate such interventions. The chosen exaples were analysed within research Catalogue 1, which through a tabular system of 4 groups of criteria analyses selected examples of existing open public spaces of varying sizes, locations, morphologies, purposes, and levels of development. The result is a typological division of existing public spaces into four different types, distinguished by their spatial, programmatic, user, and identity status: attractive spaces, spaces of reduced attractiveness, unused spaces, and undetermined spaces of natural environment. The typological division of existing public spaces based on their status differentiates the types of public spaces according to their ability and capacity to accommodate temporary urban interventions.

The second part of the research resulted in the criteria that define the impact of temporary interventions on public space and determine the selection of their location within specific types of existing public spaces. Research was conducted trough an analysis of 25 examples of temporary urban interventions of varying sizes, purposes, programmes, and physical characteristics through a tabular system of criteria trough research Catalogue 2. The selected examples included temporary urban interventions that were placed in selected public spaces, also analysed in the research. The result is a typological division of temporary urban interventions into five different types, distinguished by the relations between their current spatial, programmatic, user, and identity impact on public spaces. The types identified include temporary artistic installations, temporary additions of urban equipment or infrastructure, temporary spatial-programmatic additions, temporary complete spatial-programmatic adaptations, and temporary generation of new space. The typological division of temporary urban interventions based on their status distinguishes types according to their impact on public space, conditioning their placement within specific types of existing public spaces.

The third part of the research resulted in the criteria for a mutual compatibility between the types of existing public spaces and temporary urban interventions, defining a successful integration of temporary urban interventions into public space. The new criteria for the integration of temporary urban interventions into public space are created based on the values from four groups of criteria for the typological classification of existing public spaces (obtained from Catalogue 1) and the typological classification of temporary urban interventions (obtained from Catalogue 2), and they study the spatial, programmatic, user and identity compatibility of temporary urban interventions and public space. The research was carried out by studying the interrelation between the current status of the existing public space, which is measured by its capacity to accept the temporary urban development (K) and the impact of the temporary urban development on the public space (U). The relations between the capacity of public space (K) and the impact of temporary intervention (U) were observed for each individual group of criteria (spatial, programmatic, user and identity) separately, and they determine the optimal value of compatibility between public space and a temporary urban intervention for each group. Fulfilment of conditions for each group is a prerequisite for successful integration. Each of the four compatibility groups results in 3 basic relations that show the optimal compatibilities, always realized between equal levels of public space capacity and the impact of temporary urban interventions. Based on the above, optimal compatibilities are achieved by the combinations of low capacity values of public space, corresponding to a low impact temporary urban intervention (K1-U1), moderate capacity values that correspond to moderate impact (K2-U2), and high capacity values of public space that correspond to a high impact temporary urban intervention (K3-U3). Apart from the optimal compatibility relation, observing each of the groups reveals the variations in compatibility, occuring in each group. These variations indicate possible relations of over-stimulation or understimulation of public space.

The conducted research and obtained results help define the importance of the conditions and capacity of a particular public space when planning temporary urban interventions in its area, as well as the danger of improper integration that does not result in the desired effects on the space. The basic research goal of establishing criteria for the integration of temporary urban interventions into public space has been fully achieved, confirming the main research hypothesis, which states that the selection of the location and integration of temporary urban interventions into public space is conditioned by a complex system of criteria of mutual spatial, programmatic, user and identity compatibility of types.

Ante Senjanović

Defining the principles of normative idiom in spatial planning

Određivanje načela prostornoplanskog normativnoga izričaja

Ante Senjanović (1980, Split) graduated in 2004 at the Faculty of Architecture University of Zagreb. He works at Ekomena d.o.o., dealing with the transformation of spatial plans.

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Date of public defence: February 13, 2025

The dissertation has 309 pages, 1225 footnotes, and 164 bibl. units (121 lit. units, 23 general legal acts, 20 urban development plans).

Spatial plans are often criticized for their lack of clarity. To obtain a building permit, the requirements for construction outlined in the plan regulations must be integrated into the project. Ambiguity can hinder those involved in the implementation from reaching a consensus on the meaning of these requirements. However, there is no research assessing the validity of this criticism, how to determine whether a plan is clear or not, or how to ensure it is written clearly.

This research approaches the spatial plan primarily as a system of messages designed to express a spatial solution through a framework of legal rules. The recipient must be able to easily understand what they may do, should do, or must refrain from doing to be authorized to build. The discipline of legal drafting encompasses certain fundamental requirements for a comprehensible normative language, which can be encapsulated in the general principles of clarity, precision, and simplicity, and can be further elaborated through specific rules and guidelines for effective writing.

This work asserts that:

- Within spatial planning, the general principles are realized through specific principles of normative language, which reflect the limitations inherent in crafting clear planning rules.
- These principles stem from the restricted ability to clearly articulate the legal relationships governed by the spatial plan.
- It is primarily these relationships, which can be defined by properties that are easily recognizable as equivalent in both the plan and design, that tend to be regulated.

These hypotheses were examined within the Croatian physical planning system, using a sample of urban development plans, based on the assumption that there exists sufficient similarity among various types of plans and across different European planning systems to support further research grounded in the results obtained here.

The research focused on three fundamental aspects of the urban development plan:

i. Content that may or must be regulated by the plan: This pertains to the specificity of spatial planning.

ii. Requirements and limitations imposed on the content by the need to interpret the plan during its implementation: This addresses the specific demands for the plan's comprehensibility.

iii. Expression of the content that facilitates easy interpretation: This relates to the distinctiveness of planning language.

The content of the urban development plan is constrained by the higher-level laws that authorize it, the ordinance on spatial plans that defines the available tools, and the manner in which it is implemented: a fundamentally legal procedure that, through the process of subsumption, verifies the equivalence of the specific properties of the building as expressed in the design against the abstract properties required by the plan.

That process requires a simultaneous interpretation of the plan and the design, in order to acquire comparable properties and their values. The adherence to the plan is provable only through the design. That creates the conventional plan content, largely shared throughout the analysed sample: a limited set of building properties easily recognizable in the design.

The content primarily needs to be expressed in the clearly articulated textual structure, both formally, so that the text is divided into clearly and systematically labelled units, and thematically, so that those units are coherent, having clear themes, and organised according to clear hierarchy and sequence.

Thematic structure is based on two primary concepts: the building class and the set of requirements defining it. The material relations between them, as well as discourse regularities, limit the number of acceptable thematic structures, and therefore the number of coherent and clear textual structures.

The basic unit of the general legal act and therefore of the plan, is the article. The set of thematically linked articles forms a higher-level textual unit. The structure of the article is highly formalised and standardised, allowing for the clear expression of the planning rule elements and their relations. The elements are: building class, building requirements, and additional information clarifying them. There exists only a limited number of coherent and clear article structures. In general, the idiom is most comprehensible when it successfully balances the requirements of:

i. precision: the content is unambiguously transmitted

ii. linguistic clarity: the language and expressions are familiar

iii. simplicity: the message is clearly articulated and easy to grasp.

The sample analysis showed the usual violations of those requirements, and general rules and principles of legal drafting. By abstracting the results of the analysis, as well as the ways to avoid those violations, the specific principles of normative idiom in spatial planning could be given:

i. appropriateness of content, which limits the plan to regulating the legally and materially correct matter, and to conventional, and easily interpretable and verifiable building properties

ii. recognisability of structure, which requires the idiom to arrange the primary concepts and textual units in a simple and transparent manner, so that the content finds itself in a predictable location, expressed in formally correct articles, which clearly transmit and present the planning rules' elements and their relations

iii. conventionality of idiom, which requires the consistent use of expressions, which need to be clear in the given context.

This research also defined a method applicable to the analysis of other kinds of plans and methods for creating them. It consists of:

i. legal aspects examination: what is the role of the plan within the system and how it is applied

ii. content analysis: normative (how the spatial intervention classes are defined and differentiated, which properties describe them) and formal (identifying conventional textual structures and forms)

iii. definition of the principles: examination of the conventional idiom, recognition of the desirable properties of the idiom, abstraction of principles.

Stjepko Golubić

Open Urbanscape of Segregation and Exclusion – Criteria for Identification, Rehabilitation and Improvement

Otvoreni gradski pejsaž segregacije i isključivanja – Kriteriji za prepoznavanje, rehabilitaciju i unaprjeđenje

Stjepko Golubić (1991, Zagreb) finished his bachelor's and master's degree in landscape architecture at the Faculty of Agriculture, University of Zagreb, graduating *magna cum laude*. Currently, he works as a CEO of a private multidisciplinary studio.

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Date of public defense: March 13th, 2025

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Open urbanscapes represent key elements of the urban environment enabling social interaction, recreation, and access to nature. Nevertheless, they are often insufficiently accessible and dysfunctional.

For this dissertation, four types of open urbanscape types with varying degrees of public accessibility have been investigated: squares, parks, garden squares, and public gardens. The research includes examples from multiple cities in Europe and the United States, encompassing open urbanscapes of different characteristics. The geographical areas of Europe and the United States were chosen due to their specific historical heritage and cultural differences. Placing open urbanscapes in the context of segregation and exclusion opened the following research questions: How can we recognize segregation and exclusion in open urbanscapes? How does the design and management of open urbanscapes contribute to segregation and exclusion?

Is it possible to rehabilitate open urbanscapes of segregation and exclusion? The objectives of the research include establishing a framework for defining open urbanscapes affected by segregation and exclusion, as well as investigating approaches to their rehabilitation and improvement.

Open urbanscapes data was collected using scientific and professional literature, primarily books and articles, documents, drawings, and photographs, as well as resources available from online sources, and some of the examples were visited personally. The data was systematized by the method of synthesis and included within catalog units separately through three catalogs: Catalog 01/A with sixty examples, Catalog 01/B with thirty case studies, and Catalog 02 with twelve case studies. The smaller the number of investigated open urbanscapes in the catalog, the more detailed the analysis of the examples was. The research is divided into two parts. The first part of the research is based on catalogs 01/A and 01/B. It includes the investigation of general data (Catalog 01/A) and design and management elements (Catalog 01/B) in the selected examples. This part of the research relates to research questions linked to recognizing open urbanscapes of segregation and exclusion through the analysis of design and management elements. The second part of the research is based on Catalog 02, which represents a comprehensive research and methodological tool that emerged from the results of the analysis in Catalog 01/B, but on twelve selected examples of open urbanscapes as multi-case studies. The examples have been analyzed to determine whether exclusive design and management elements affect the attributes of open urbanscapes. Attributes are characteristics that make open urbanscapes inclusive: accessibility, usability, comfort of use, unrestrictiveness, safety, identity and publicness. Approaches for rehabilitation and improvement are proposed with the goal of preserving, creating, or enhancing attributes affected by exclusion. In the second part of the research, criteria for the rehabilitation and improvement of design and management elements are established, also serving the rehabilitation and improvement of open urbanscapes.

The results of the research lead to the definition of existing and new criteria for identifying, rehabilitating, and improving open urbanscapes of segregation and exclusion. The new criteria for recognizing open urbanscapes of segregation and exclusion are criteria of limited accessibility, limited usability, reduced comfort, limited movement, reduced safety, reduced sense of belonging and ownership, and as well as the limited right to stay. New criteria for rehabilitating and improving open urbanscapes are also defined through the rehabilitation and improvement of their design and management elements: introducing new elements, transforming, removing, relocating, contextualizing and reinterpreting existing elements, as well as temporary interventions.

In the introduction, the problematics of the research related to open urbanscapes of segregation and exclusion are presented. Here, key terms related to the topic are defined, and the importance of this research is emphasized in the context of contemporary urban challenges.

The literature review analyzes existing theoretical frameworks that deal with the themes of segregation and exclusion in urban spaces. Various approaches used in previous research are presented, and the need for new criteria that will enable a better understanding of these phenomena is emphasized. Historical examples from which today's open urbanscapes have developed are also considered, as well as the influences of social, economic, and political factors on their accessibility.

In the methodological approach, the research tools and methods used are described in detail. They include qualitative analyses, field research, and comparative case studies that enable a deeper understanding of design and management elements that contribute to segregation and exclusion. The process of selecting examples for analysis and the data collection method on open urbanscapes is described.

The research results in the definition of new criteria for identifying open urbanscapes of segregation and exclusion. These criteria enable a better recognition of spaces that are exclusive to certain people. The dissertation also offers recommendations for the rehabilitation and improvement of open urbanscapes. The analysis shows that existing practices often favor certain groups of users while marginalizing others, leading to further social fragmentation.

In the conclusion, the importance of integrating new criteria into future planning of open urbanscapes is emphasized to ensure equal opportunities for all users.

This doctoral dissertation contributes to a broader understanding of urban planning and design problems through the prism of inclusiveness, offering practical guidelines for urban planners, landscape architects, architects, and policymakers to create more just and accessible open urbanscapes. The developed frameworks can serve as further research that will deepen the understanding of the relationship between open urbanscapes and social interactions within the urban context. The proposed criteria can serve as a guide for designing new open urbanscapes or rehabilitating and improving existing ones to make them more inclusive.

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