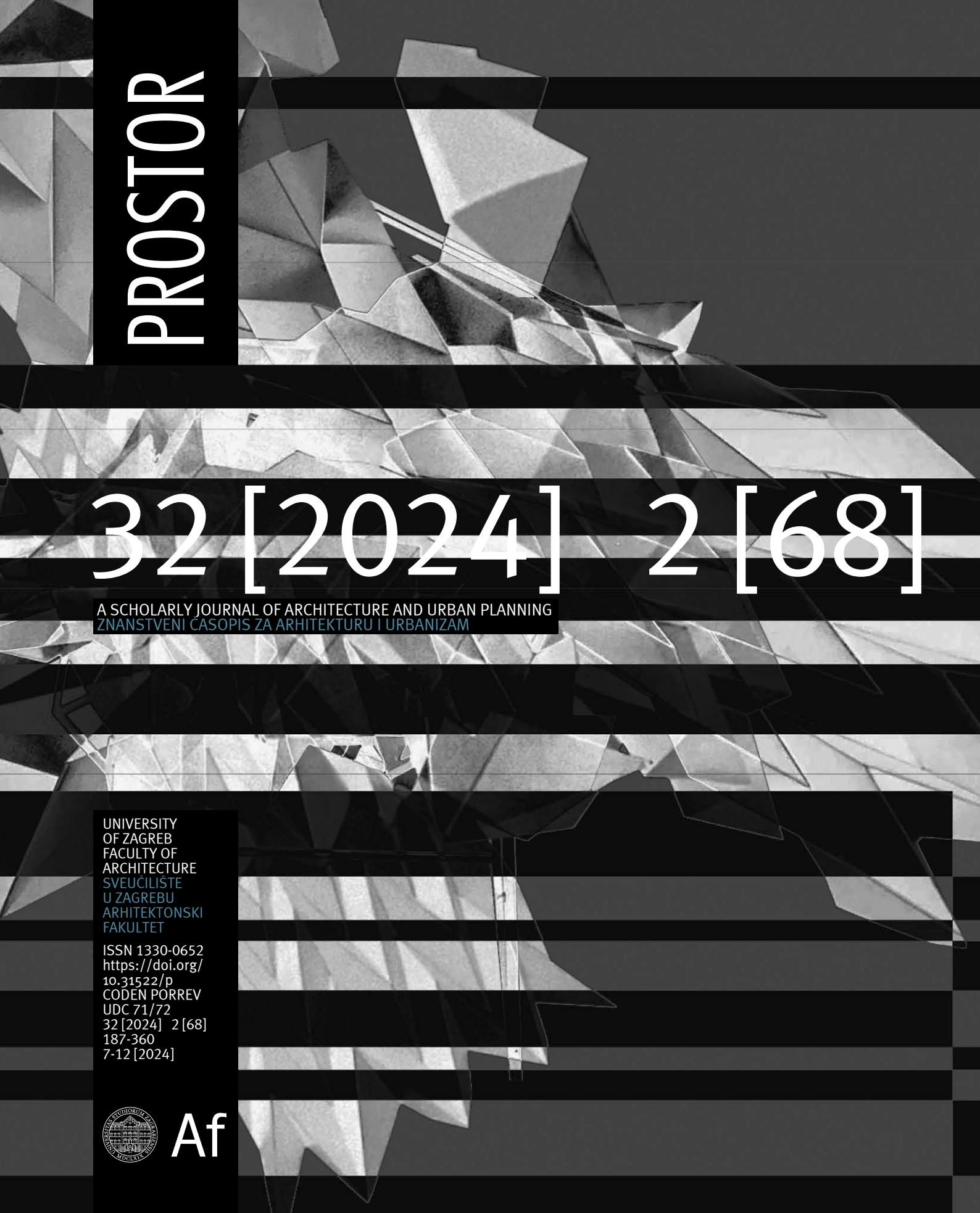

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OF ZAGREB
FACULTY OF
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SVEUČILIŠTE
U ZAGREBU
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MEANINGS | ZNAČENJA

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

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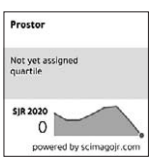

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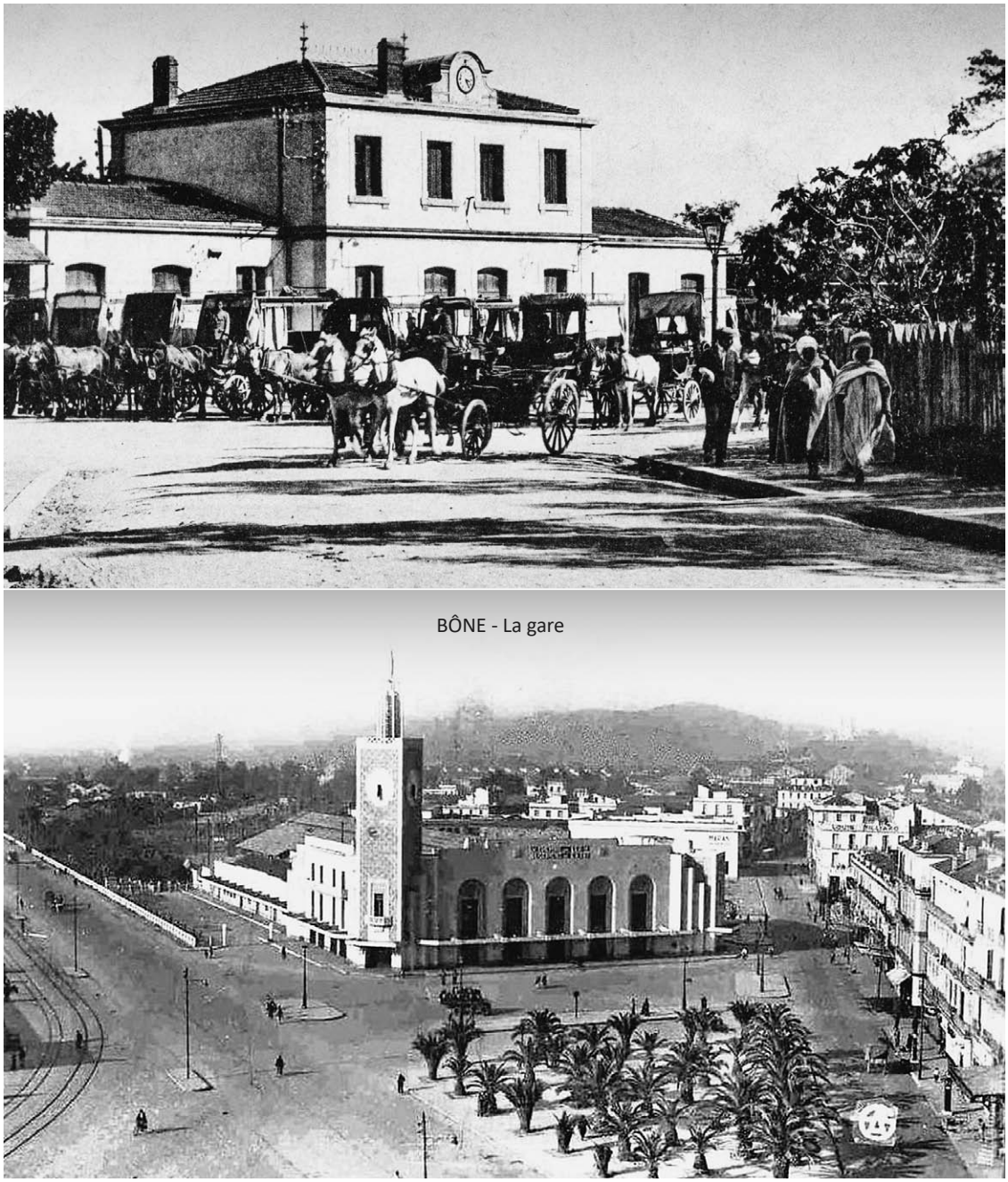

Fig. 1 (up) Bône-Guelma company's first railway station (early 20th century);
(down) second Bône railway station (mid 20th century)

Aldjia Djaileb[1], Boussad Aiche[2]

[1] University of Blida1, Laboratory ETAP, Institute of Architecture and Urban Planning, P.O.Box 270, Route de Soumaa, Blida, Algeria
https://orcid.org/0009-0006-5464-2211
[2] University of Mouloud Mammeri of Tizi Ouzou, Department of Architecture, P.O.Box 17RP, Nouvelle ville, Tizi Ouzou, Algeria
https://orcid.org/0000-0002-1238-588X

aldji.djaileb@gmail.com
a.kh.djaileb@etu.univ-blida.dz
b_aiche@yahoo.fr

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Architecture of Railway Stations in Annaba (Algeria) during 19th and 20th Centuries

From Bône-Guelma Pier to Annaba's Terminal Station

Annaba (Bône), Algeria
architectural style
heritage conservation
railway station
19th and 20th-century architecture

Annaba, with its port, was among the pioneering Algerian cities to have a railway system installed during the latter half of the 19th century. The Bône-Guelma company constructed its station in an architectural style that was brought over through French colonization. The station was operational for multiple decades and played a significant role in the city's growth during the early 20th century when a new, substantially larger station replaced it. This paper analyzes the architecture of both of these stations. Both structures were constructed during distinct historical and economic periods. By analyzing and comparing unpublished archival documents and conducting on-site research, we were able to examine the architectural typologies of these two buildings and identify their unique stylistic characteristics in comparison to similar buildings constructed in the colonies and mainland France. This work seeks to enhance the historical understanding of railway architecture in Algeria, specifically focusing on 19th and 20th-century railway stations. Its objective is to promote the preservation and acknowledgment of these stations, thereby contributing to scientific knowledge in this field.

INTRODUCTION

Railroads and railway stations, which emerged during the early 19th century as symbols of the industrial and railway revolution, serve as tangible evidence of the architectural and engineering advancements that occurred during that time. The station was introduced to Algeria in the latter half of the 19th century, coinciding with the arrival of French colonization, after its origin in Europe with the emergence of the railway. This new structure combines elements of *half-palace and half-factory*, showcasing both the grandeur of industrialization and the monumental architectural style prevalent in the 19th and 20th centuries (Schivelbusch, 1979, cited in Paone, 2023: 4). The architectural evolution underwent multiple stages (Meeks, 1995).[1] In France, during the early 19th century, the first stations were constructed without any historical influence. They were designed as basic structures resembling piers and landing stages, which were commonly used in river transport (Fournier and Lamming, 2017: 22). These stations were built in a neoclassical style that prioritized practicality and functionality over aesthetics.

Later regarded as modern-era cathedrals (Pruneda and Angoiti, 2005: 9), they were constructed in a variety of styles, including historicist, regionalist, and modern. In addition to the most prestigious stations, there are also terminal or transit stations that are categorized based on their level of significance, ranging from first to sixth class. Railroads altered the geographical landscape of territories and stations, which had previously captivated locations for exotic journeys (Ragon, 1984: 6). Their influence on writers, poets, musicians, and painters was profound, and they significantly transformed both the urban and natural environment. Historian Fernard Braudel went as far as stating that *"more than Jeanne d'Arc, it was the railway that shaped France"* (Cartier, Roux and Fessy, 2007: 10).

In Algeria, similar to numerous other ancient colonies in Africa and Asia, the railways exerted a significant impact on the process of colonization (Sulistyani, 2023: 2614) and brought about substantial changes to the conquered region. The concept of building a railroad goes back to the beginning of French colonization. The decision to completely and definitively occupy the country required that it be equipped with a railway network. In 1857, the many projects outlined resulted in the "central Tell line"[2] (Delavigne et al., 1854: 9). A sort of great North African ring road (Lartilleux, 1946: 6), it was intended to connect Algiers to Oujda in Morocco and Tunis in North Africa, promoting the growth of colonization. Perpendicular lines connecting major cities to important ports were constructed.

In 1879, a second program was launched with the primary goal of homogenizing all of the lines built by five different companies before constructing penetration lines to the south and branch lines to the main artery. The third plan of 1907 was developed after Algeria gained financial autonomy in 1900, creating new circumstances in which railroads could be used as a tool of pacification (Bejui, Raynaud and Vergez-Larrouy, 1990: 16), consolidating the existing network and establishing multiple branch lines and connections. The 1920 program came after the state had taken over the vast majority of lines and established CFAE[3], which shared the network with PLM and was primarily concerned with reor-

1 According to (Meeks, 1995), station architecture was divided into five phases, ranging from experimentation to maturity. They began as simple shelters built along the first railroad lines between 1830 and 1845, before becoming more standard in the middle of the nineteenth century. Railway stations became a veritable field of collaboration between architects and engineers during the sophistication phase that lasted from 1860 to 1890. The architects' intervention introduced the monumentality and megalomania that would characterize station architecture until World War I. The stations from the final phase (1914-1956), which was characterized by competition between railroads and new modes of transportation such as airplanes and automobiles, were designed in the twentieth century style, sometimes in a modern architectural style, sometimes in a regionalist language.

ganizing the entire system. This coincided with the decline of railroads due to competition from automobiles, prompting the government to focus on reorganizing network management and modernizing rail lines and infrastructure.

Following independence, Algeria inherited long railroad lines, which paved the way for the construction of numerous railway stations that can still be found in our cities today. While certain structures have become non-operational, posing a risk of losing a significant portion of Algerian railroad history, others continue to maintain their use value. The study of the architectural design of train stations in Algeria during the period of French colonization in the 19th and 20th centuries is not extensively explored. Except for a few specialized studies, the only work that examines the morphic aspect of Algeria's oldest railway stations is the work conducted by (Boulkroune and Bouslama, 2015). The authors analyzed the main façades of about twelve stations. The paper by Kebbour, Bouzaher and Alkama (2022) explores the impact of military factors on the design and structure of Algiers' central railway station. In their comprehensive theses, Safir (2011) examined all the stations and engineering structures along the Algiers-Tizi Ouzou line, and Benaissa Chérif (2023) focused on the significant railway stations during the colonial era.

This paper contributes to the body of scientific knowledge on Algerian railway stations, with a particular emphasis on the Annaba (formerly Bône) stations (Fig. 1). The two structures provide insight into the evolution of railway architecture during the colonial period. The first is one of Algeria's doyenne stations, an example of a typology newly imported by French colonization. The second, on the other hand, is regarded as a significant accomplishment of the 1930s in Annaba, with a unique architectural configuration that adapts railway attributes to an Arabist repertoire interpreted with modern lines and set in a local context.

This research focuses on the architectural and stylistic characteristics of two buildings built during French colonial rule in distinct historical, political, and economic contexts. It will attempt to answer the following question: What is the architectural character of Annaba's first and second stations, and what contribution do they make to the architecture of stations in Algeria and beyond (French colonies)? We will assume that these stations have distinct characteristics when compared to those built in metropolitan France during the same period.

Methodology

The first part of this study is based on a historical theoretical methodology, specifically examining the historical progression of the railroads in the city of Annaba and their influence on its growth and advancement. The second section examines the functional, stylistic, and structural aspects of the passenger buildings' architecture at both stations. The research methodology employed for this study has involved archival research[4], which brought together unpublished documents from Algeria and France. Additionally, documentary research was conducted by consulting various writings on the subject. Fieldwork was also carried out, consisting of a study of the stations in situ (Brajnov Botić and Sokol Gojnik, 2024: 131) and observational work (Kurniawan et al., 2019: 471) of all architectural elements of both buildings, accompanied by detailed photographic documentation. By employing a comparative approach, it became feasible to assign a distinct architectural character to each of the stations and determine their stylistic influence by comparing them to other stations and structures built during the same era in Algeria, North Africa, or France.

Bône, a Railway and a Railway Station for the Constantine Region Port

Annaba is a seaport located in the eastern region of Algeria. It is situated 500 kilometers away from the capital city, Algiers, and approximately 20 kilometers from the border with Tunisia. This city has a long and rich history, spanning thousands of years, during which multiple civilizations have influenced it. The origins of this can be traced back to ancient times, specifically to the establishment of the Phoenician trading post of Hippone (Cote and Camps, 1988: 3), which eventually transformed into the Punic Hippo (Salhi and Dönmez, 2021: 84). Hippo, constructed during the Roman era, was a prosperous trading hub situated between the Boudjema and the Seybouse valleys. Following the

2 The imperial decree of April 8, 1857 (Bejui, Raynaud, & Vergez-Larrouy, 1992) authorized the creation of three lines connecting the main Algerian cities to the ports: Algiers-Blida, Oran, Saint Denis Sig and Constantine-Phllippeville. Awarded to the Compagnie des Chemins de Fer Algériens (CFA – Algerian State Railway) and then to the PLM, the Algiers-Blida line, inaugurated in 1862, was the first rail line to carry both passengers and merchandise in Algeria.

3 CFAE: Chemin de Fer Algérien de l'Etat (Algerian State Railways)

4 In Algeria, we consulted the National Archives of Algeria, the archives of the SNTF (Société Nationale du Transport ferroviaire) in Algiers, and the archives of the regional rail authority in Annaba. We also consulted archives located in France, such as the ANMT (Archives nationales du Monde du Travail) in Roubaix and the ANOM (Archives Nationales d'Outre-Mer).

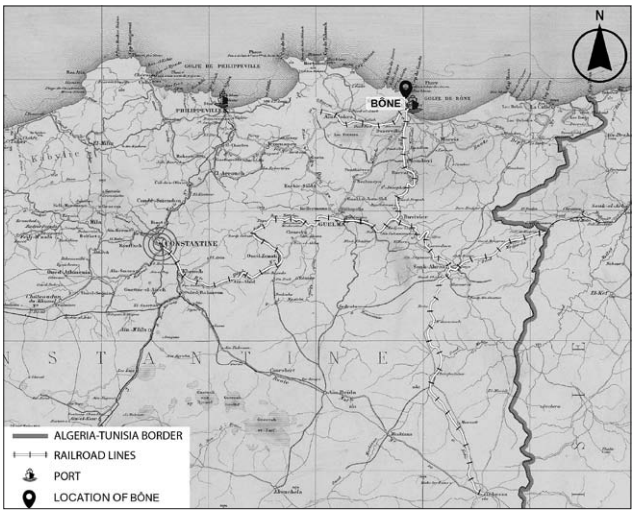


FIG. 2 RAIL AND PORT CONNECTION OF THE CITY OF BÔNE

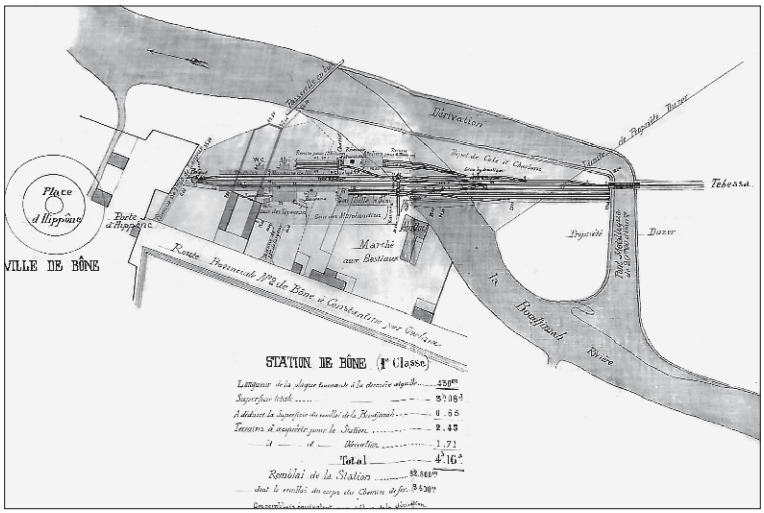


FIG. 3 MASTER PLAN OF BÔNE-GUELMA RAILWAY STATION

Muslim conquest in the 11th century, a city called Bouna El Hadidha was established (Hacini-Chikh and Rouag-Saffidine, 2009: 23). Although Bône had a favorable location near Tunisia and a port, it was not fit to become the capital of eastern Algeria during this period (Travers, 1958: 498). Undoubtedly, the Constantine region was primarily linked to the sea through the port of Skikda.

Meanwhile, the Far East focused on Tunisia (Travers, 1958: 498) in its trade relations. During the French colonial period, the city, which would later be renamed Bône (Djouad and Spiga, 2018: 52), finally achieved regional[5] dominance, both administratively and economically, thanks to the mines/railway/port importance (Cote and Camps, 1988: 7; Fig. 2), which would play a key role in the city's prosperity. The private mining line from Bône to Ain Mokra (Tomas, 1969: 49), established in 1859, was specifically used for transporting iron ore from the Karezas deposit to the port. This line was in operation even before the "Algiers-Blida" line opened in 1862[6] (Bejui, Raynaud and Vergez-Larrouy, 1990: 10).

The "Bône-Guelma" regional railway line, along with its steep descents, constitutes the eastern segment of the Algerian portion of this significant transportation route. The award was granted to the Société de Construction des Batignolles in 1872, officially recognized as being in the public utility in 1874, and subsequently acknowledged as being of general interest in 1877. Established in 1846 (Park-Barjot, 2005: 81), this company achieved significant success on a global scale in the field of public works. Following multiple projects in Europe and Asia, the company developed a particular focus on North African railroads. In 1875, it established the *"Compagnie des chemins de fer Bône-Guelma et prolongements"* to manage its railway line in the region. The company regarded the "Bône-Guelma" line as the main artery of an extensive railway network, serving as the central trunk (conseil administration du Chemins de fer de Bône-Guelma et prologements, 1877: 4) that connected Constantine to the Tunisian border on one side and the mineral-rich agricultural region to the coast on the other. Thus, it served as both an economic and military tool to facilitate colonial expansion towards Tunisia. In 1915, CFAE assumed control of the entire network as it strives to modernize rail lines and infrastructure.

RESULTS AND DISCUSSION

BÔNE-GUELMA RAILWAY STATION

Bône-Guelma, a first-class station, began operations on September 1, 1876, coinciding with the inauguration of the Bône-Duvivier railway section. The company chose an extramural site to the south of the European city, close to the port, on land, resulting from the diversion of the mouth of the Boudjemah into the Seybouse valley and the reclamation of the small plain (Bensaâd Redjel and Labii, 2015: 117; Fig. 3). Although considered a mainline station, the company built the passenger building in a layout parallel to the track, a design generally used for transit stations in France. Similarly, the central station

5 It became a transit port for wine and citrus products (Tomas, 1969: 39) and cereals from the sublittoral plains destined for export to mainland France. Industrial activity was also booming, thanks to iron ore from the Ouenza and phosphates from the Kouif, which could only be transported by rail.

6 It is considered the oldest railroad in Algeria. The *Société civile des mines et hauts fourneaux des Karesas* constructed this private, solely industrial railway in 1859. It was operated by the "Mokta El Hadid" company and opened to the public in 1905.

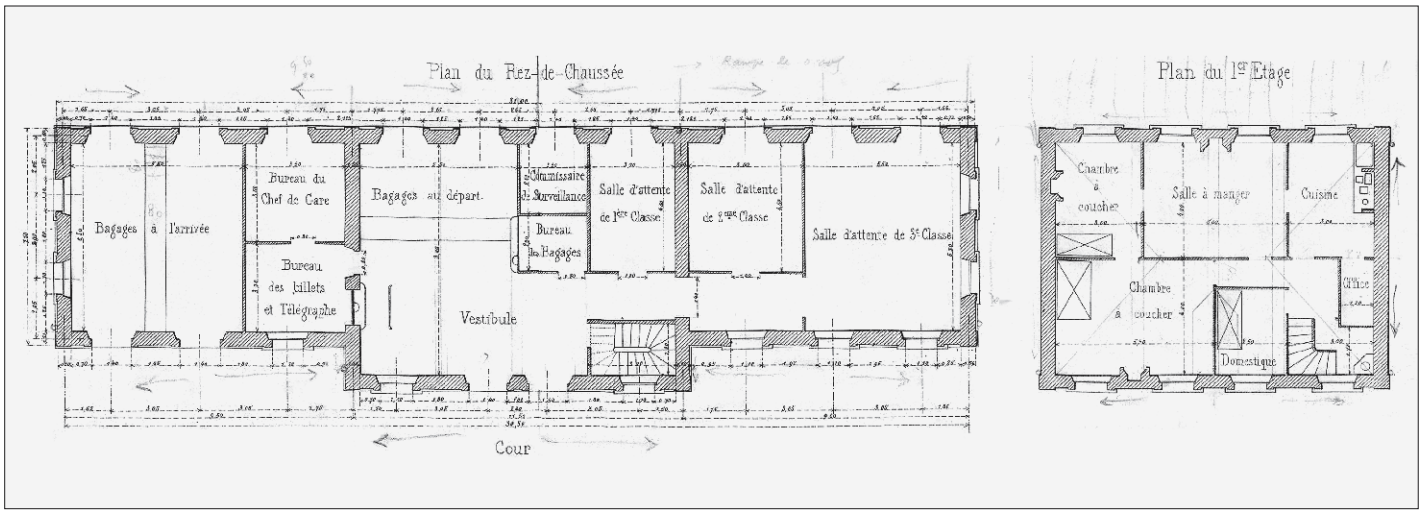
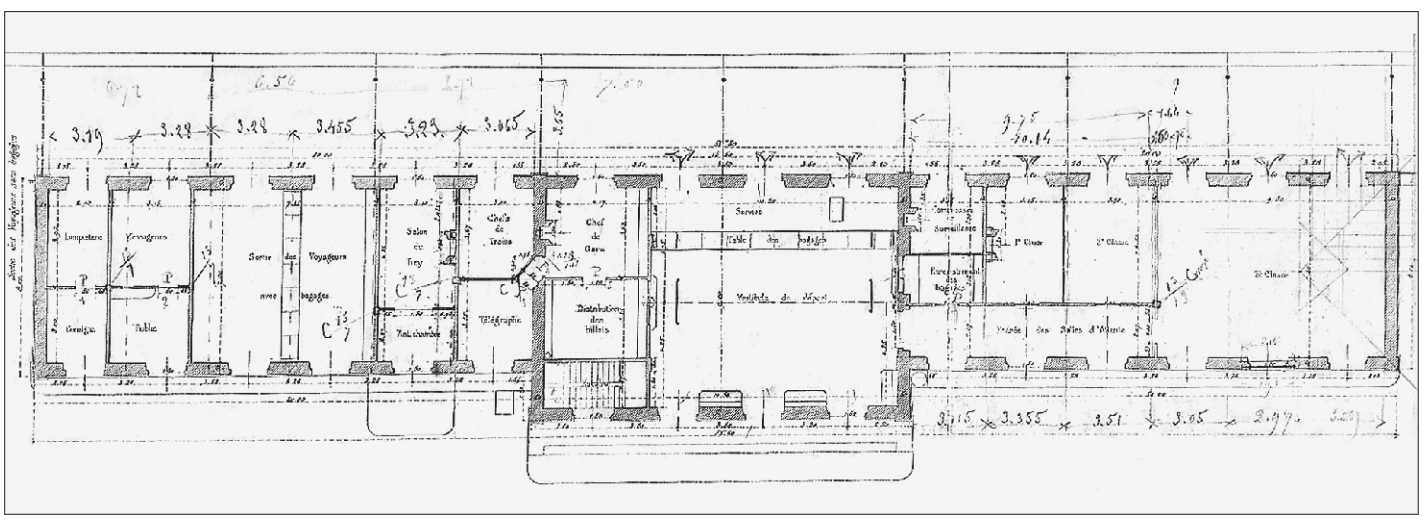


Fig. 4 Ground floor and first-floor plan of Bône-Guelma station

of Algiers, constructed in 1868 (Boulkroune and Bouslama, 2015: 45) and the Constantine station also experienced this situation. The station has a spatially elongated plan that adheres to the recommended passenger building layout for medium-sized French stations in the 19th century. This includes an entrance that is preceded by a passenger courtyard, a clear separation between the arrival and departure departments, and the segregation of classes in the waiting rooms. These design principles were outlined by (Perdonnet, 1856; Goschler, 1872; Humbert, 1891; Fig. 4).

The building can be accessed through the central pavilion, which contains the vestibule. The vestibule serves as a reception area and is surrounded by different sections dedicated to ticket sales, baggage drop-off and check-in, and waiting for first-class passengers. Conversely, the second and third-class waiting rooms are situated in the right wing. The left-wing, on the other hand, is designated for the station manager's office, the telegraph ticket office, and the arrival baggage room. Furthermore, this designated area not only facilitates the retrieval of passengers' luggage upon train arrival but also enhances the management of passenger traffic by providing them with a direct exit from the station, eliminating the need to navigate through other sections. Similar to other passenger stations during that time, the second floor accommodates the stationmaster's living quarters. The space comprises a dining room, a kitchen, two bedrooms, a maid's room, and a pantry. The Tunis station, also referred to as the Gare du Sud was constructed by the same company in 1877 (Azzabi, 2006: 73). This was done to distinguish it from the Italian TGM station (Mansour, 2018: 4), which shares a similar design but is larger. The vestibule and third-class waiting room at the Tunis station (Fig. 5) are larger compared to those at the Bône station.

Fig. 5 Ground floor plan of Tunis station



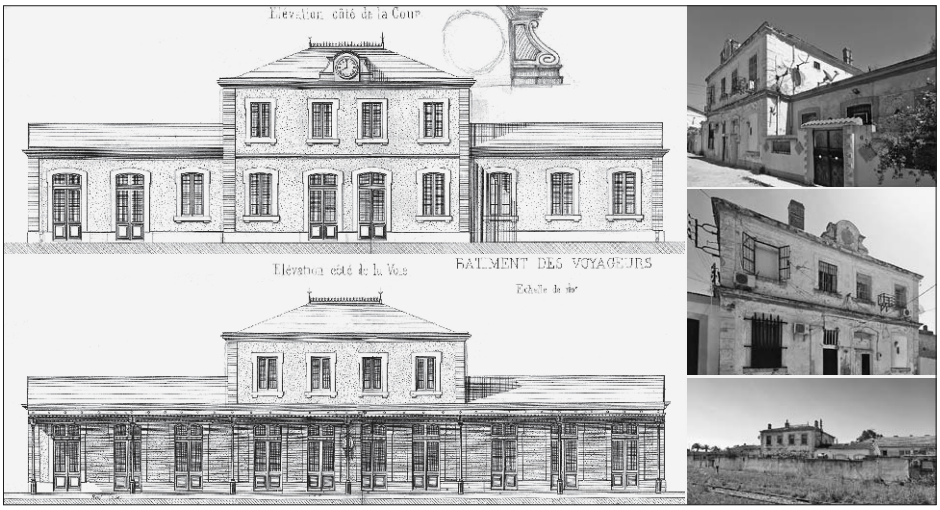


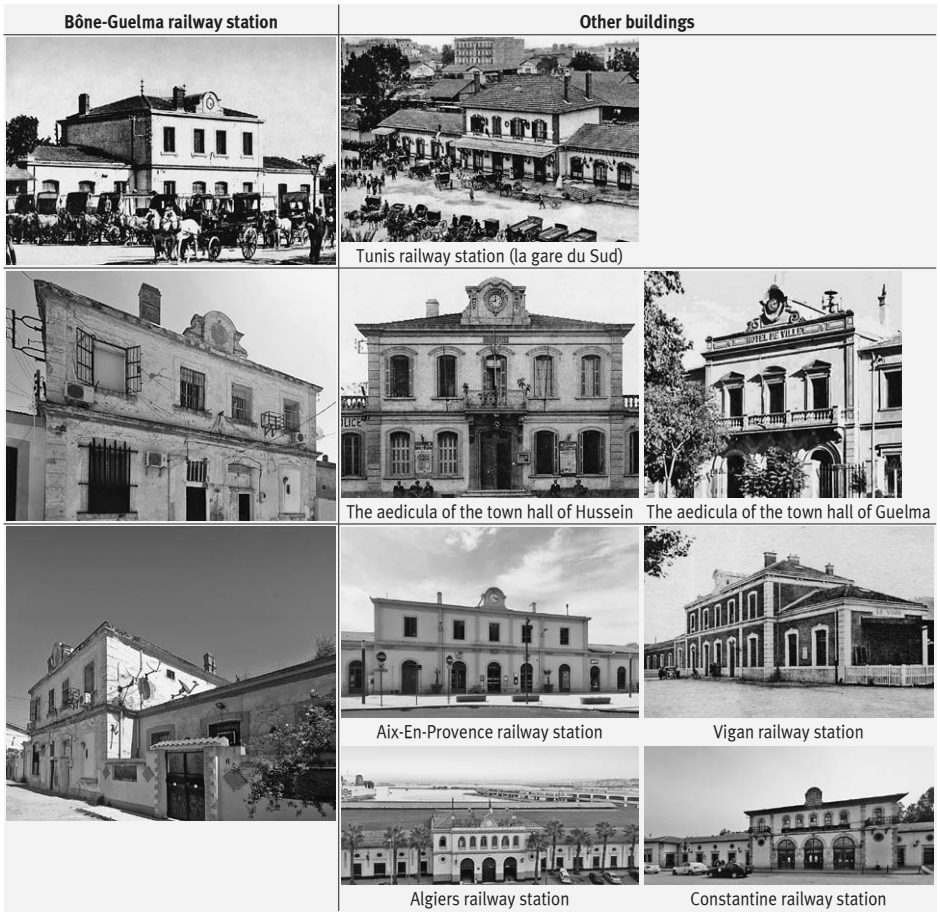
Fig. 6 Facades of the Bône-Guelma station

Additionally, the Tunis station has specific areas that are unique to it, such as Bey's salon with its antechamber, the lamp room, and other independent services that were not present in the passenger building at Bône.

Bône's initial station is characterized by the neoclassical architectural style (Fig. 6). The "conqueror's style" (Dali and Belakehal, 2023: 158) was the dominant architectural style in Algeria during the 19th century. Derived from Greco-Roman architecture, this style of decoration was primarily used in public buildings to symbolize the colonizer's authority and supremacy. The main front of the building lacks excessive embellishments and instead employs a vocabulary that is both logical and understated. The Bône station is distinguished by its symmetrical design and division into three parts: the basement at the bottom, main body in the middle, and crown consisting of a tiled roof structure.

Similar to the Tunis railway station, the central section consists of four spans and is divided into two levels by a string course. The first level is characterized by alternating bays and windows with a low arch, while the second level has four simple rectangular windows in a row. The building is surrounded by two side wings on the ground floor only, which are protected by a gambrel roof. The ornamentation is reduced to brick chainwork on the corners, which lends elegance to the whole, to the segmental-arched frame, which gives a robust effect, and to the punches that punctuate both ends of the ridge of the four-sided roof (Fig. 7).

Fig. 7 Comparison between Bône-Guelma station and other structures built during the same era



The difference from the Tunisian case is the more pronounced keystone framing of the openings, as well as the clock and decorative wall panels set between the openings, which add relief and artistic dimension to the overall design. The Bône Station Building is topped by a central clock enclosed in a pediment, forming an aedicula. The main facade of railway stations often includes a monumental clock (Perdonnet, 1856), which serves as a symbol of colonial power and technical progress. Its presence not only regulates rail traffic but also serves as a reminder of the value of time and, above all, of the triumph of the industrial and rail revolution.

The clock was generally incorporated into the ornamental system of the first town halls constructed in Algeria during colonial rule. The town halls of Hussein Dey (1868) and Guelma (1880) (Fekrache, 2022: 160) perfectly illustrate the use of this element as an integral part of a pediment constituting the characteristic aedicula of this typology, built in a neoclassical style as sober and simplified as that of the Bône station. The station's overall architectural appearance, with its neo-classical repertoire and railway features, is strikingly similar to the first-class PLM station model. Indeed, this company creates a "strict and austere" type (Notarnicola and Poupardin, 1991-1992: 108) for medium-sized stations. One variant, represented by the Aix-en-Provence and Vigan stations, has a single-

story central body topped by a pediment and slightly forward of the lower side wings (Poupardin, 2008: 60).

Furthermore, despite the difference in the number of bays, the passenger buildings in Vigan (which began passenger service in 1874) and Bône have the same architectural treatment in terms of composition and ornamentation. However, the first high-quality stations built by the PLM in Algeria clearly have a more elaborate architecture in terms of size and vocabulary. The Algiers and Constantine stations, for example, were inaugurated on July 1, 1867, and September 1, 1870, respectively, and feature more imposing neoclassical facades with a variety of architectural elements such as bull's-eyes, bas-reliefs, and larger openings.

The structure of the Bône-Guelma station is supported by 50 cm thick ashlar walls. At a distance of 9.5 m for the side wings, they support a wooden framework, and at 10.5 m, they support the wooden floor of the second level of the central body. A metal-framed canopy runs along the entire façade on the side facing the road. Supported by columns, it covered the platforms, protecting passengers and their luggage from the elements. Today, no trace of the marquee remains, and the station, now occupied by a residence, is in a state of neglect.

The Second Bône Station

During the first half of the 20th century, the city of Bône underwent major economic and demographic development. It was the third largest city on the Algerian coast (F.B., 1933: 3), after Algiers and Oran. The rail traffic in the area grew in importance, leading to the conclusion that the primitive pier (Mailland, 1934: 1), which also served as the station, was unhygienic and inadequate for a prosperous city like Bône. It was decided that a more modern station was needed (Cotereau, 1933: 1001). As part of the railway network modernization program, which happened at the same time as the electrification of the Bône-Oued Keberit line, the city was supposed to have the biggest station in North Africa at that time (C.M., 1933a: 1). The construction would take place on two plots of land measuring 21434.21 m² each, located 100 meters away from the port and in close proximity to the Cours Bertagna, which is an expansive esplanade that serves as a boundary between the European city and the Arab-Muslim Medina (Laouar, Mazouz and Teller, 2019). In 1891, BG obtained this site with the purpose of expanding their railway lines and constructing a new station (Ardoin, 1935) to provide passengers with easier access to the city center (Fig. 9). The CFAE adopted and approved it, and it was validated by the *Plan d'Aménagement et d'Extension du Grand Port Est-Constantinois*, under the authority of the *"Société des Plans Régulateurs de villes"*, commonly referred to as the *"plan des consorts Danger"* (Cotereau, 1933). The construction of the building was finalized, and it was made accessible to vehicles on July 1, 1933.

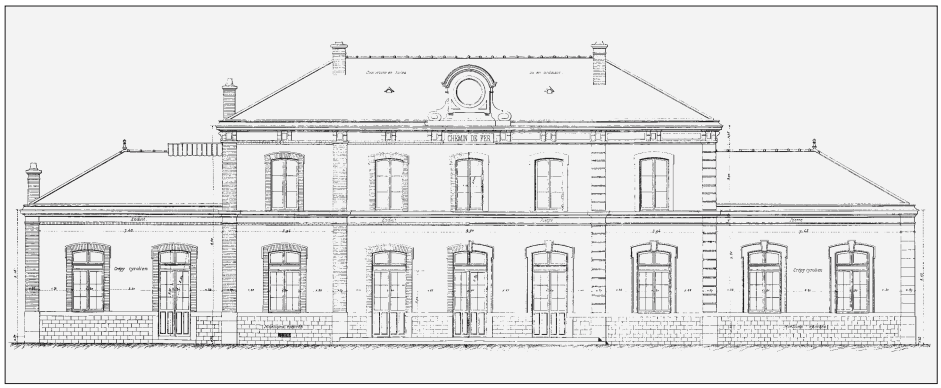
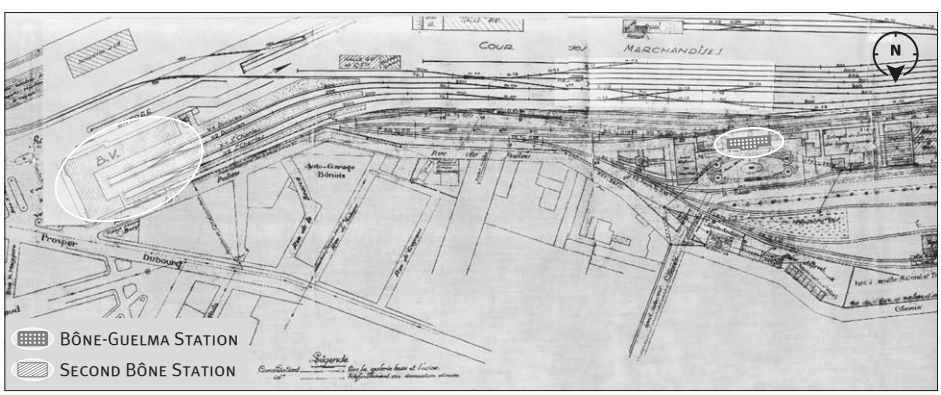


Fig. 8 First-class PLM station model

CFAE commissioned young architects Pierre Choupaut and Pierre Truchot to design the new passenger building, and Enterprise Nord-Africaine de Construction was contracted to construct it. Pierre Choupaut (1895-1956) and Pierre Truchot (1894-1970), both DPLG architects and architects of historical monuments, obtained their degrees from the Ecole des Beaux-Arts de Paris, one of the most prestigious architecture teaching institutions in France. In 1928, they established their architectural practice in Bône, opting to pursue their profession in the colony. By virtue of their titles, training, and administrative roles, they were granted the privilege of receiving public commissions from the colonial administration (Piaton and Chebahi, 2016: 41), in contrast to architects trained in the local area. Based on the suggestions of the CFAE administration (M, 1933a: 1), the two architects designed the passenger building in a U-shape,

Fig. 9 Localization of the second Bône railway station in relation to the first one



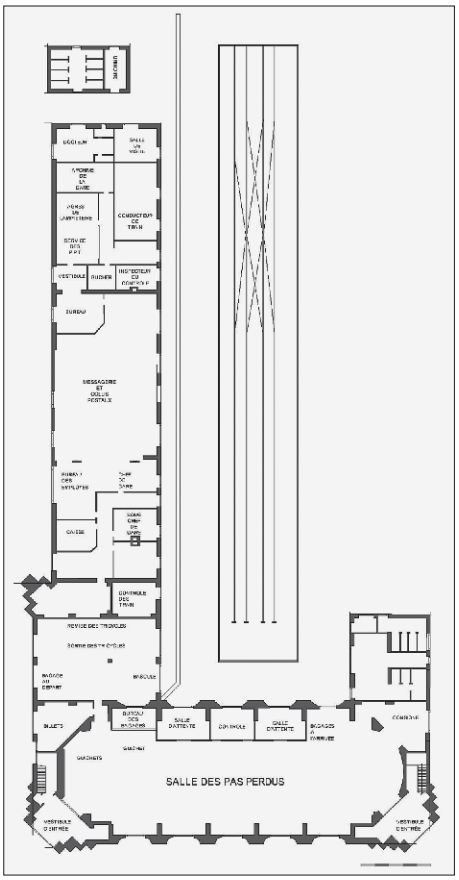


FIG. 10 PLAN OF THE SECOND STATION OF BÔNE

FIG. 11 INTERIOR VIEWS OF THE CONCOURSE

FIG. 12 THE MAIN FACADE OF THE SECOND STATION OF BÔNE

with the main body positioned at a right angle to the tracks. This arrangement is commonly used for head-of-line stations in France but has never been used in Algeria.

The Bône station is the only one in Algeria with this U-shaped layout. The spatial arrangement of the layout is both functional and practical, with the main body positioned in the east-west orientation. The announcement is made through a large open area that functions as a passenger courtyard and is preceded by a meticulously designed garden. At first, it contained the department responsible for passenger services. This department included a large concourse with services for departing passengers on the left side, waiting rooms for the three different classes of passengers in the middle, and services for arriving passengers on the right side. The administrative services were located in the east wing, while the staff apartments and mess halls were situated in the west wing (Fig. 10).

The expansive and radiant concourse (Fig. 11) is lit by a series of five towering openings that penetrate the main façade. The ends are delineated by two inclined sections from which the side facades emerge. The doors have a rectangular shape and are surrounded by ornamental stucco panels. The windows are adorned with intricately designed frames embellished with geometric patterns and are crowned with round arches adorned with rosettes (Fig. 12). The composition brings to mind the five elongated, curved, and minimalist bays of the Versailles-Chantiers station, which were designed by architect André Ventre and finished in 1932. Unlike the predominant verticality of the structure, a transparent concrete canopy serves as a prominent horizontal feature that extends along the facade of the Annaba station, positioned above the doors. The main facade's perfect symmetry is disrupted by a grand 45-meter tower adorned with a clock featuring three radiant dials. The dials measure 5.50 meters in height and 4 m in width, with hands that are 1.50 and 2 m long. From the 20th century onwards, the clock tower became an emblematic representation of railway architecture (Kanai, 2005). The incorporation of railway architecture began in 1902 when architect Marius Toudoire (Safir, 2011: 111) added a tower with a clock on each side to the Paris Gare de Lyon, commissioned by the PLM company. The identical company introduced it to Algeria, employing it for the construction of the Oran station in 1913, designed by Al-

bert Ballu and Toudoire (Aïche, 2020: 2), this time in a neo-Moorish architectural style.

Historians of railway architecture consider it to be a significant and influential structure that serves both symbolic and practical purposes. It stands out as a prominent landmark that enhances the visibility of the station within the city, competing with traditional landmarks like church bell towers that existed before the industrial era (Fig. 13). The campanile of the Raincy church, designed by Auguste Perret, was built in 1922 using reinforced concrete (Aymone, 2005: 196). It is topped by a spire and is considered a significant architectural achievement. This structure served as an inspiration for the designers of the Bône railway station. The spire-shaped clock tower is made of reinforced concrete, with a 6 meters extension for a lightning conductor. The Annaba covered market was designed in an Art Deco style by the same architects who drew inspiration from Auguste Perret's Paris Rotunda. In addition, they constructed a tower with a reinforced concrete spire on top. During the 1930s, clock towers gained popularity as a stylish addition to railway stations, and architects frequently incorporated them into their designs. For instance, in France, the second railway station in Le Havre has a layout and main body façade that resemble those of Annaba. This similarity is observed in terms of spatial configuration and the arrangement of high bays interrupted by a canopy. The tower, distinguished by its spire, is the sole upright component that contrasts with the overall horizontal arrangement. Its detached position enables the four clock faces to be visible from a distance. The building, which was opened in 1932 (Pacon, 1932), was created by architect Henri Pacon, who also received education at the Ecole des Beaux-Arts de Paris.

Architect Charles Rosazza (R, 1936: 1) selected to include a clock tower with a towering spire at the main entrance of his project as part of the competition for the construction of the Constantine railway station. The preliminary design for Tunis's central station, created in 1930 by Algerian architect Cés (*** 1930: 330), includes a spire on top of the tower. Cés was awarded the fifth prize for this design. Besides the spire, the clock tower at Annaba station includes a balcony that provides a view of a modest office. In contrast to city halls, which serve as symbols of administrative authority (Mohdeb, Attar and Saraoui, 2023: 103), balconies are infrequently utilized in railway stations. However, it is possible to install a prestigious balcony in the belfry of a city hall. An example that demonstrates this is the Mostaganem city hall, which was reconstructed in 1927 by architect Charles Montaland in the Art Deco architectural style (Fekrache, 2022: 216). If clock towers evoke the campaniles of churches and the bell towers of town halls in Europe and Algeria, they recall the minarets of the mosques that have been rising for centuries in Algerian cities. The minarets of the mosques have been rising for centuries in Algerian cities. At the start of the 20th century, they applied their unique style to public buildings, giving them an Arabized appearance while still adhering to European construction standards.

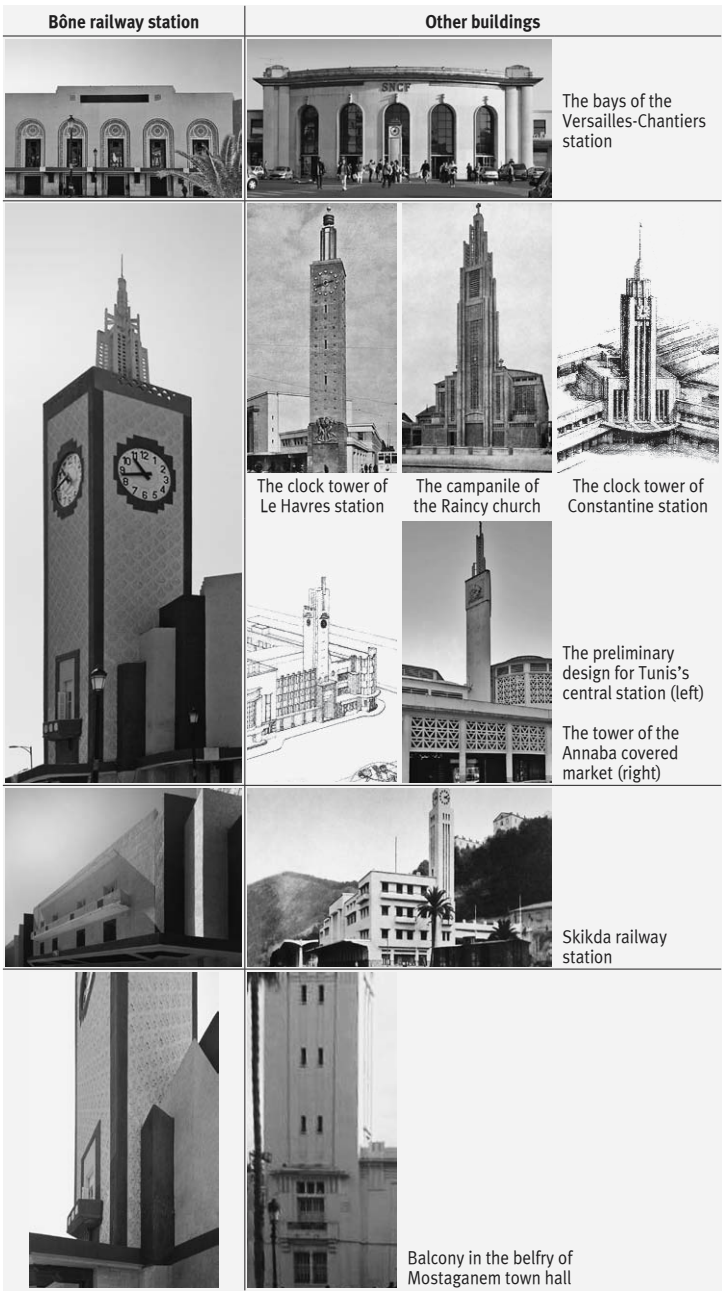


Fig. 13 Comparison between Bône station and other structures built during the same era

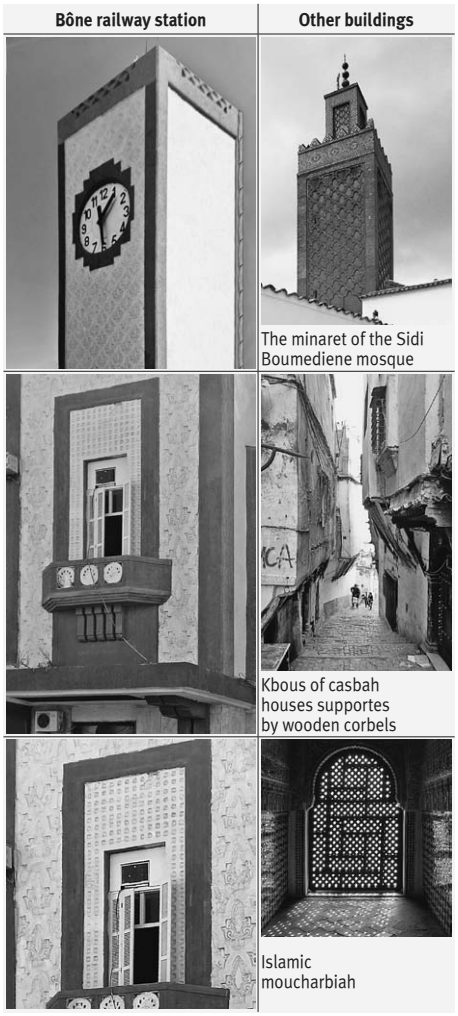


FIG. 14 THE INFLUENCE OF ISLAMIC ARCHITECTURE ON BÔNE STATION

The neo-Moorish style was formalized and generalized by Governor Jonnart as part of France's desire to revive Algeria's medieval Muslim past. Referred to as "the protector style" (Béguin, 1983: 19), this style takes inspiration from the local Arab-Muslim culture. Regarded as a Pastiche style, Cotereau (1933: 1003) argues that the uniqueness of the Bône station lies in the "energy boost" it offers, which the architects added to the neo-Moorish style mandated by CFAE (M, 1933a: 6).

Their design was characterized by a rational and harmonious style, incorporating Moorish influences, particularly in the tower, which resembled the square-based minarets commonly found in the Maghreb region. They also used a tapestry with a juxtaposition of floral patterns that resembled the minaret of the Sidi Boumediene Mosque in Tlemcen. The monumental balcony supported by a series of five brackets with claustra decoration is similar to the Kbous of casbah houses supported by wooden corbels, while the decorative claustra panel is reminiscent of the moucharabieh found in Islamic architecture (Fig. 14). Furthermore, they opted for an exterior paint color that initially resembled the sandy red hue commonly found on vernacular earthen structures (Benaissa Chérif, 2023: 249). During the same period, Montaland designed the Skikda railway station in a futuristic neo-Moorish style (Chalabi, 2011: 50), incorporating a clock tower and locally inspired decorative elements. The passenger building is oriented parallel to the tracks, in contrast to the layout of Annaba. It follows a traditional, linear design, consisting of a central structure and two wings on either side. The side façades feature long, narrow windows that open onto balconies, which extend outward and lack any additional decorative elements.

The composition is also visible on the lateral facades of the Annaba train station. In terms of its structure, Choupaut and Truchot utilized the capabilities of reinforced concrete, employing it for the concealed framework of the campanile. It allowed the clock tower to achieve a height of 40 meters. The expansive concourse, towering at a height of 12 meters, provides a spacious area of 42×16 m². This is made possible by a ribbed floor that is upheld by five arches. The terrace ceiling is constructed with a ribbed floor covered by a single slab that is waterproofed with Tecto. The walls are made of double-walled hollow agglomerate rubble, with a thickness of 1.10 m on the main section and 0.50 m on the secondary sections, providing good insulation. The interior partitions are constructed using hollow bricks.

Due to the unpredictable soil conditions near the western dock of the harbor, Franki piles foundations with a reinforced concrete base were employed. These foundations were occasionally extended to a depth of 18 meters below the clock tower (C.M., 1933b: 8). If the passenger building is the work of the architects, the metal hall is the engineers' place of expression, often hidden (Bowie, 1996: 20) behind a façade created by the former. It is a light construction housing the boarding platforms (Safir, 2011: 113), referred to as "these large metal canopies that were intended to protect both railroads and passengers". With its origins in market halls (Laborde, 2003: 9), it became the place to display new materials left bare as a structural and ornamental element. Maison Durafour designed the one at Bône station. The steel structure measures 101.5 meters in length and 26.5 meters in width. It is topped with a pitched, corrugated metal roof that includes two 12-meter-wide skylights made of reinforced glass (Fig. 15).

CONCLUSION

The railroads and the city influence each other. If the Bône-Guelma line and its first station had an impact on Annaba's economic and urban development, the importance of this city conditioned the architecture of its second station. The development of station architecture in the former Bône region can be likened to that of metropolitan France. These structures are the outcome of the exchange of knowledge and expertise between mainland France and its colonies, as well as the joint efforts of various stakeholders, including concessionary companies, engineers, and architects.

Furthermore, the comparative approach showed that, spatially and functionally, the companies played a major role in determining the type of station. Using the prominence of the locality as the primary criterion, the Bône-Guelma had a pre-established standard layout of passenger buildings in metropolitan France inspired by standard French passenger stations. Political influence could sometimes be exerted on this predefined spatial layout (as in the case of the Tunis station). In terms of style, the initial stations were designed in an institutional manner, evoking the influence of colonial authority. They were constructed using a neoclassical architectural style that was imported and widely adopted, reflecting the prevailing aesthetic of the time.

Nevertheless, the participation of architects in the design process of Annaba's second station resulted in a distinctive architectural masterpiece that combined contemporary design with a regional influence, evident in

the protective covering reminiscent of the local style. The metropolitan inspiration is derived from the exchange of models between the two sides of the Mediterranean. It can be rationalized by the architects' education and experiences or by the architectural publications that emerged during that period.

Thus, we can note that the first station's configuration and imported architectural style are typical of 19th-century French stations built in metropolitan France or the colonies. The second, on the other hand, is a product of a number of influences related to its construction context, which was marked by the rise of Bône, the nationalization of the railway network, an appreciation for local architecture, and the beginnings of modernism. The findings allowed us to ascertain the historical importance of the first and second Annaba stations in the field of architecture, as well as contribute to the documentation of the history of railway architecture in Algeria.

From a practical standpoint, studying 19th and 20th-century railway stations adds to our scientific understanding of Algeria's railway heritage. By providing an overview of technical and historical knowledge, it may serve as a theoretical foundation and tool for defining future conservation and enhancement strategies. On the one hand, this necessitates a better understanding of the restoration and renovation work required to restore buildings' architectural authenticity. On the other hand, upgrading can be accomplished by relocating buildings that have lost their use value in order to preserve their historical and architectural value and ensure their durability or by incorporating them into potential cultural and/or tourist circuits. In this way, the research project encourages institutional and public recognition of railway heritage, resulting in its patrimonialization. It also contributes to increased awareness of its role in the urban landscape, architectural history, and collective memory, particularly through digital and other traditional media.

[Translated by
Beyond Words Lingusitic Services]

Fig. 15 Views of the train shed of Bône station

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Sources of illustrations

Figs. 1, 9	Archives of the SNTF (Société Nationale du Transport ferroviaire)
Fig. 2	Base map: Gallica, BNF, modified by the authors
Figs. 3-5, 6 (drawings)	ANMT (Archives Nationales du Monde du Travail)
Figs. 6 (photos), 11, 12, 15	Authors, 2021
Figs. 7, 13, 14	Authors, 2024
Fig. 8	*Gare voyageurs PLM du Type 1ère classe – WikiPLM*, 2010. Available at: https://wikiplm.railsdautrefois.fr/wikiPLM/index.php/Fichier:DGCF_1880_BV1_001_CRDAJ.jpg (Accessed: 28 September 2024)
Fig. 10	Drawn by the authors based on an archival plan

Nomenclature

BG – Compagnie des chemins de fer Bône-Guelma et prolongements (Bône-Guelma railway company)
CFA – Chemins de Fer Algérien (Algerian Railways)
CFAE – Chemins de Fer Algériens de l'Etat (Algerian State Railways)
DPLG – Diplômé par le Gouvernement (Government-approved diploma)
PLM – Compagnie des chemins de fer de Paris à Lyon et à la Méditerranée (Railway Company of Paris to Lyon and the Mediterranean)
TGM – Tunis-Goulette-Marsa

Authors' biographies and contributions

Aldjia Djaileb – Architect holding a diploma from the EPAU in Algeria. She is now pursuing her doctorate at Blida1 University. Her research focuses on the heritage of 19th and 20th-century architecture in Algeria.

Boussad Aiche – Architect with a Ph.D. from the University of Bordeau and senior lecturer at the University of Tizi-Ouzou. He has contributed to numerous European programs about twentieth-century legacy. He is a senior consultant in the "Programme Patrimoine" and is in charge of developing inventory guides, thesauri, and catalogues.

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

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Fig. 1 The combination of natural ecology and urban life within the framework of Urban Forest

Diefan Wang

Changzhou University, School of Art and Design, Changzhou, China
Southeast University, School of Art, Nanjing, China

https://orcid.org/0009-0001-3935-2244

wdf@cczu.edu.cn
diefanwang6@outlook.com

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Ecological Design and Public Art
Impact on the Perception of the Urban Environment

AFFECTIVE PERCEPTION OF DESTINATION IMAGE
ECOLOGICAL URBAN PLANNING
NEIGHBORHOOD ATTACHMENT
PERCEIVED ENVIRONMENTAL PROPERTIES
PUBLIC ART

The study aims to evaluate the impact of a public art project within the framework of ecological urban planning on various parameters: the perception of the environment, the image of the area, and the level of neighborhood attachment among residents and visitors. The objective of the public art project was to integrate artistic design into ecological urban planning. The primary research method involved surveying local residents and visitors in the Xiangjiang New District (Changsha, China) in 2020 and 2023. A statistical analysis of the survey results revealed significant changes in the perception of certain properties of the urban environment, such as complexity, naturalness, typicality, openness, and consistency. The results also indicated that the project enhanced the overall image of the city and key aspects such as dynamism, sociability, innovation, creativity, and quality of life. These findings can facilitate the more effective integration of public art into ecological design and deepen the understanding of its impact on positive socio-cultural and environmental aspects in cities, thereby benefiting urban planners, designers, and government authorities.

INTRODUCTION

In light of the growing interest in sustainable development and environmental issues, modern cities face the need for innovative approaches to urban design. Sustainable development refers to a concept focused on creating and ensuring a sustainable balance between social, economic, and environmental aspects. The main task of sustainable development is to meet the current needs of society, without compromising the ability of future generations to meet their own needs (Jeronen, 2020; Zhao et al., 2022). Ecological design is an approach to environmental design that focuses on public welfare, environmental sustainability, and the creation of livable spaces. (Sopiana and Harahap, 2023). This approach applies to various fields, such as the design of urban parks, public squares, recreational areas, and other places of public use. Thus, environmental design is the creation of sustainable, eco-friendly, functional, and attractive spaces (Peng et al., 2024). In the context of urban planning, researchers have paid attention to the relationship between public ecological landscaping and public art (Carmona, 2021).

Public art is a form of artistic creation placed in public spaces (O'Callaghan, 2009). The main idea of public art is to appeal to a wide audience outside the walls of galleries and museums (Sharp et al., 2020). The types of public art include graffiti and street art, sculptures and installations, street murals, and interactive projects. Public art can be a means of self-expression for artists (Macaya and Valero, 2019), as well as a way to enrich public space and involve citizens in the visual perception of their environment (Cuffie, 2021; Luo et al., 2022). The use of public art has gained high momentum, and only in Europe alone, 180,000 new works emerge every year (Boffi et al., 2023). However, there is a lack of comprehensive research on the role of public art in ecological urban planning. Previous studies have shown how public art can fit into the natural elements of the urban landscape, creating harmony with the environment (Ode Sang et al., 2022; Saeedi and Dabbagh, 2021). Researchers have also considered the ecological side of public art and its impact on education and awareness-raising on environmental issues (Ardoin and Bowers, 2020).

In the context of exploring the potential of public art in ecological urban planning, sustainable development implies the creation of ecological urban spaces. In this case, elements of public art not only include aesthetic design but also involve citizens in caring for the natural environment and participating in environmental projects. Scientific literature still lacks studies that specifically address the impact of public art based on ecological design on local populations and perceptions of the environment. China, in its quest for sustainability and development against the background of intensive urbanization, can provide a unique context for exploring the impact of public art in ecological design. This study explores the potential of public art as an effective tool to support and promote the principles of sustainability in modern cities.

LITERATURE REVIEW

Each city has a unique history of development. The design of a city reflects its cultural background and artistic elements, creating a harmonious atmosphere between the population and the environment (Grenni et al., 2020; Liang and Wang, 2020). Urban planning and design require solutions and elements aimed at a careful impact on the natural environment and human well-being (Ebbesson et al., 2024; Panagopoulos et al., 2016). Currently, many cities in China lack general planning in the field of landscape design (Huang, 2023; Liang and Wang, 2020). As a result, the urban composition remains chaotic, and the ecological value of the urban landscape is insufficient for the development of many cities. An important task of urban landscape planning is the implementation of sustainable urban development. Therefore, strengthening the ecological design of urban landscape planning is crucial. There is an obvious problem of "emphasis on appearance

and disregard for ecology" in the landscape design of many Chinese cities (Dong, 2021).

Design plays an important role in social progress and innovation, contributing to the era of sustainable development (Blasi et al., 2022; Kutty et al., 2020). Urban landscape design focused on sustainable development promotes an effective combination of nature, society, and the economy (Tian, 2020). The concept of sustainable development is constantly being developed, enriched, and specified, opening up new directions for research in various disciplines (Xu, 2018). With the steady increase in urbanization, sustainable urban development has become firmly entrenched in the public consciousness. The significance and level of urban landscape design continue to improve. In the field of urban landscape planning and design, it is essential to implement the concept of sustainable development to harmonize and unify land, resources, population, economy, and the environment (Zhou and Zhang, 2019). In this context, the goal of public art is not only to create a beautiful space but also to actively influence the perception of the environment and raise awareness of environmental issues. Public art can become a platform for public engagement in the discussion of sustainable development. Interaction with works of art can facilitate the exchange of opinions and ideas. Art projects can reveal the values of sustainable development, necessitating respect for nature, efficient use of resources, and the creation of green urban spaces (Naheed and Shooshtarian, 2022; Vidal et al., 2020). Public art can create a unique identity for urban areas, highlighting their features and attractiveness in terms of sustainable development. Interesting and inspiring works of public art can stimulate the society to make changes in everyday habits according to the principles of sustainability (Zou, 2019). Thus, public art becomes a powerful tool for communication and visualization of sustainable development ideas. This form of art can create an engaging environment and maintain a long-term interest in environmental issues in the urban landscape.

There is a disagreement among researchers in the assessment and perception of public art since the latter can exert an ambiguous impact on urban space and communities. Some contemporary authors (Boffi et al., 2023; Matthews and Gadaloff, 2022; Sharp et al., 2020) underline the importance of art-driven regeneration for the development of social, identical, and economic potential. At the same time, cities that have undergone transformations related to public art often lack a sense of community, local cultural traditions, and dialogue between old residents and newcomers (Falanga and Nunes, 2021; Grodach et al., 2018; Zebracki and De Bekker, 2018). From the perspective of the community, there is an opinion that public art contributes to psychological recovery in urban conditions and heightens a sense of civic pride (Bornioli et al., 2018; Ode Sang et al., 2022).

In their time, Hall and Robertson (2001) questioned the main previously identified advantages of public art in terms of a sense of place, identity, social transformations, and educational value. According to Hall and Robertson (2001), criticality in public art research was insufficient and has not been fully disclosed to evaluate the statements made in the context of public art. This conclusion necessitates more effective research and analysis methods aimed at assessing the impact of public art in public spaces.

However, more recent research (Boffi et al., 2023; Sharp et al., 2020) continues to report on the benefits of public art, including its impact on the local population. Thus, Boffi et al. (2023) have studied changes in neighborhood attachment and image of place after the implementation of a renovation project based on public art in the suburbs of Milan. Boffi et al. (2023) found that street art based on local culture correlated well with the attachment of local residents and destination image. However, there was no significant impact among non-residents. Sharp et al. (2020) focused on the inclusive role of public art in the urban regeneration project. As noted by Sharp et al. (2020), the advantages of public art are its ability to inspire local pride and promote local identity. Nevertheless, despite these positive aspects, public art can be controversial because of its symbolism, which can cause different interpretations and opinions (Sharp et al., 2020). A sense of pride is a key component of inclusivity in relation to public art (Sharp et al., 2020). The abundance of ways to interpret public art and the variability of urban societies can pose challenges to community unity. Therefore, it can be challenging to establish a certain meaning (Sharp et al., 2020).

Motoyama and Hanyu (2014) studied the influence of public art on visual properties and affective appraisals of landscapes. The authors reported that the presence of public art decreases the pleasantness of the natural scene but does not reduce the attractiveness of the urban environment. Additionally, Motoyama and Hanyu (2014) found that, although some types of public art can make the natural landscape more pleasant, the result depends on the level of excitement. According to Motoyama and Hanyu (2014), the environment with an optimal average level of excitement contributes to the maximum pleas-

FIG. 2 THE CHILDREN'S UNIT OF THE PROJECT THE CITY GATHER PARK

antness. Eye tracking data showed that visitors spent about a third of their total time walking along the picturesque Danube Canal (Vienna, Austria) to view and study graffiti and sculptures (Mitschke et al., 2017). At the same time, as noted by Mitschke et al. (2017), the time for viewing public art had significant variations: while some participants could spend more than 50% of the time on it, others could spend a little more than 10%.

This study sees it necessary, firstly, to study the influence of public art embedded in environmental design on the local population, a sense of pride, and neighborhood attachment. Secondly, the study aims to examine the impact of public art embedded in environmental design on the perception of the environment. Based on the literature review, it is possible to form the following research questions:

RQ1: Has the project changed Perceived Environmental Properties among residents and visitors?

RQ2: Has the project changed Affective Perception of Destination Image among residents and visitors?

RQ3: Has the project changed Public Art Project Image among residents and visitors?

RQ4: Has the project changed Neighborhood Attachment for residents and visitors?

The purpose of the study is to assess the impact of the public art project within the framework of urban ecological planning on the perception of the environment, the area's image, and the level of neighborhood attachment among residents and visitors.

CASE STUDY

The City Gather Park is located in Xiangjiang New District (Changsha, China), the strategic planning area of One Belt and One Road. This is the first high-end project of the "City Series" that are planned for Changsha. In the neighborhood, there are prestigious infrastructure facilities (Tianxin District Commercial Center and the Yuelu Cultural Center) and Yanghu National Wetland Park. The City Gather Park occupies an area of 10,000 square meters and is a vivid example of a combination of natural ecology and urban life (Fig. 1).

The City Gather Park project rests on the concept of Urban Forest, a combination of urban environmental design and public art. Urban Forest implies the creation of green areas with modern installations and sculptures that not only serve as decoration but also establish an environmentally friendly environment. The concept focuses on increasing the number of green spaces in the city and creating places suitable for rest and relaxation in densely populated areas. Green areas inside the city improve air quality and the overall ecology. Artificial installations, sculptures, and even interactive objects are installed in various parts of Urban Forest-based areas to enrich the visual experience of visitors and stimulate their interaction with nature. Urban Forest promotes a positive attitude towards nature in the urban environment and emphasizes the importance of environmental sustainability in urban planning. This cutting-edge approach demonstrates how public art can be successfully introduced into the urban environment. Urban Forest draws attention to environmental issues, creating attractive places for locals and visitors, including children (Fig. 2). Therefore, a project based on Urban Forest was chosen as a model for research.

Materials and Methods

Participants

Two samples of residents and visitors of Changsha (China) were chosen as participants in the study. The first sample was recruited in 2020, when The City Gather Park project had not yet been implemented. Art design facilities were completely absent within the green zone, the green zone was not landscaped). The second sample participated in 2023, when the art design project had already started functioning. A total of 322 questionnaires were processed, 155 from 2020 and 167 from 2023.

In Sample 1, the average age of participants was 36.7 years; there were 52% women and 48% men. In Sample 2, the average age of participants was 38.3 years; there were 56% women and 44% men. The study participants included both residents (local population) and non-residents (tourists and visitors). The percentage of respondents was 67% in Sample 1 and 63% in Sample 2. Samples 1 and 2 represent different groups of participants. Participants from 2020 are not the same people as participants from 2023. The study did not assume that they were the same people. At the same time, we attempted to form equivalent samples to minimize the impact of demographic characteristics on the results.

Procedure

This study was a quasi-experimental study design. Participants in Sample 1 and Sample 2 answered questions from the same questionnaire at different time periods: at the initial stage of the project and after the project was implemented. Xiangjiang New District is a highly urbanized and densely populated business district. In addition, the media actively discussed the project, so almost all residents and visitors contacted by the researchers immediately understood what kind of a project they were asked to take part in. The links to the questionnaires were posted on local social media groups. The participants filled out the questionnaires in person. The survey was in Chinese. No personal information was collected. All participants were of legal age.

Scales

This study used the Model for Assessing the Potential of Public Art in Ecological Urban Planning. The Model includes 4 components (Fig. 3): (1) Perceived Environmental Properties; (2) Affective Perception of Destination Image; (3) Public Art Project Image; (4) Neighborhood Attachment. Perceived Environmental Properties combines complexity, naturalness, brightness, typicality, openness, and coherence (Motoyama and Hanyu, 2014). Complexity: A measure of the diversity and complexity of visual, structural, and textural elements in an environment. Naturalness: The number of such natural elements as plants, water or natural materials. Brightness: The level of illumination or brightness in a given area. Typicality: Compliance of the environment with the local typical architecture or style. Openness: Free space and visibility, contributing to spaciousness. Coherence: The connection and consistency of the elements of the environment with each other.

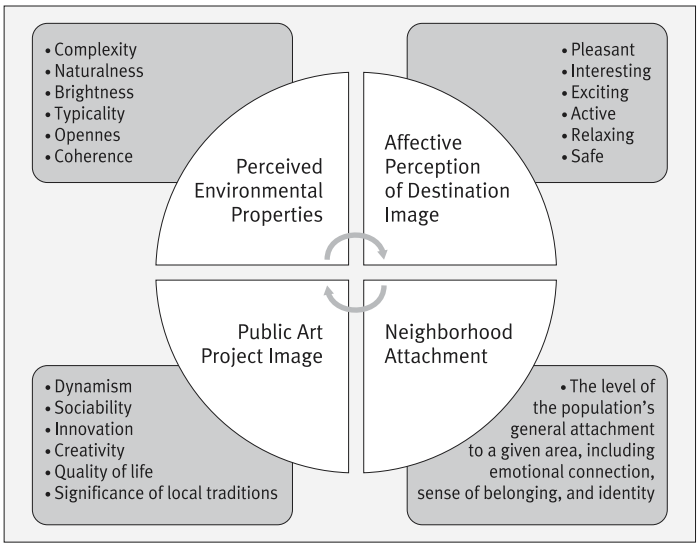

Fig. 3 Model for Assessing the Potential of Public Art in Ecological Urban Planning

Affective Perception of image destination covered six aspects: Pleasant, Interesting, Exciting, Active, Relaxing, and Safe (Motoyama and Hanyu, 2014). Pleasant: The extent to which the image of the area is pleasant or evokes positive emotions. Interesting: The capability of the image of the area to attract attention and arouse the interest of the observers. Exciting: The level of stimulation and excitement caused by the image of the area. Active: A measure of activity, regarding the formed idea of the area. Relaxing: The ability of the reputation of the area to create a sense of peace and relaxation. Safe: The level of security associated with the area.

The image of the public art project included the following categories: dynamism, sociability, innovation, creativity, quality of life, and significance of local traditions (Boffi et al., 2023). Dynamism: The project's level of dynamism. Sociability: The capability of the project to stimulate social interactions. Innovation: The availability of innovations and modern elements. Creativity: The presence of creative ideas and approaches. Quality of

Life: The impact of the project on the overall quality of life in the area. Significance of Local Traditions: Compliance of the project with local traditions and cultural values.

Neighborhood Attachment implies the feelings, connections, thoughts, and intentions of people in relation to their socio-physical environment (Fornara et al., 2010). This term is part of a more general concept of place attachment. The latter is formed over time and covers the affective and emotional connections of a person with their spatial environment (Brown and Perkins, 1992). Place attachment goes back to the theory of attachment by Bowlby (1988) and refers to affective and emotional patterns that establish a connection between people and their places, giving a special meaning to life. This conceptual framework of place attachment overlaps with other constructs such as belonging to a place, place identity, dependence on a place, rootedness, a sense of community, and a sense of place (Fornara et al., 2010).

The participants indicated their socio-demographic data: age, gender, residence status (within or outside the district), as well as the presence of their own children. They evaluated the following aspects: Perceived Environmental Properties, Affective Perception of Destination Image, Public Art Project Image, and neighborhood attachment.

Perceived Environmental Properties had to be assessed in terms of six items: Complexity, Naturalness, Brightness, Typicality, Openness, and Coherence (Motoyama and Hanyu, 2014). The respondents used a 5-point Likert scale. The interpretation of the points was as follows: 1 – no complexity at all, no naturalness at all, no brightness at all, no typicality at all, no openness at all, no coherence at all; 5 – great complexity, great naturalness, great brightness, great typicality, great openness, great coherence. *Affective Perception of Destination Image* included six aspects: Pleasant, Interesting, Exciting, Active, Relaxing, and Safe (Motoyama and Hanyu, 2014). Each item had to be evaluated from 1 to 5 points, with 1 meaning *unpleasant, uninteresting, boring, inactive, distressing, fearful* and 5 meaning *pleasant, interesting, exciting, active, relaxing, safe*.

The participants evaluated *Public Art Project Image* on six points: Dynamism (Florida, 2019), Sociability (Putnam, 2000), Innovation (Florida, 2019), Creativity (Mabile, 1983), Quality of life (Diener et al., 1999), and Significance of local traditions (Carmona, 2010). A similar approach was applied in the study by Boffi et al. (2023). Each point was rated from 1 to 5 points on the Likert scale. Interpretation: 1 – almost not dynamic, almost sociable, almost not innovative, almost not creative, low quality of life, and low significance of local traditions; 5 – very dynamic, very sociable, very innovative, very creative, a high quality of life, a high significance of local traditions.

The *Neighborhood Attachment Scale* (Fornara et al., 2010) contained 8 items, for example "This is an ideal neighborhood for me". The participants assessed each item according to the degree of agreement with it (from 1 = disagree to 5 = completely agree). The internal reliability of the Neighborhood Attachment Scale (Cronbach's Alpha) was 0.84 in this study.

STATISTICAL DATA ANALYSIS

The study used an independent t-test to answer research questions about changes caused by the project in the Perceived Environmental Properties (RQ1), Affective Perception of Destination Image (RQ2), Public Art Project Image (RQ3) and Neighborhood attachment (RQ4). This tool helped compare the results of two similar samples of participants for the period of 2020 (Sample 1, before the introduction of public art) and 2023 (Sample 2, after the start of the project). The data was tested for normality. The histogram test confirmed the normality of the distribution for parametric tests. The data was analyzed in IBM SPSS.

RESULTS

• **RQ1: Has the Project Changed the Perceived Environmental Properties among Residents and Visitors?** – In general, on the scale the Perceived Environmental Properties between Time 2 (M_{Time2}=3.30, SD_{Time2}=0.64) and Time 1 (M_{Time1}=2.97, SD_{Time1}=0.66), there are statistically significant differences (t=7.24, p=0.001) with a noticeable effect size (d=0.516; Table I). Five of the six categories on the Perceived Environmental Properties assessed by residents and visitors for the period Time 2 are significantly higher than for the period Time 1: Complexity (t=13.27, p=0.000), Naturalness (t=6.19, p=0.012), Typicality (t=6.87, p=0.001), Openness (t=6.42, p=0.026), Coherence (t=6.77, p=0.001). The effect size was the largest for Complexity (d=0.928), but for the other categories, the effect size was also noticeable.

• **RQ2: Has the Project Changed Affective Perception of Destination Image among Residents and Visitors?** – As for the project-driven changes in Affective Perception of Destination Image, there are no statistically significant differences on the scale (Table II). Significant changes have occurred in only one category:

Table I Descriptive statistics and independent t-test scores between Time 1 and Time 2 on Perceived Environmental Properties

Perceived Environmental Properties	Time 1		Time 2		t	p	d	95% CI (Lower-Upper)
	M	SD	M	SD				
Complexity	2.91	0.66	3.49	0.59	13.27	0.000*	0.928	0.698–1.159
Naturalness	3.12	0.48	3.36	0.56	6.19	0.012*	0.459	0.237–0.68
Brightness	2.88	0.72	3.01	0.73	1.13	0.317	0.179	–0.04–0.398
Typicality	3.11	0.65	3.46	0.70	6.87	0.001*	0.517	0.295–0.74
Openness	3.05	0.74	3.38	0.61	6.42	0.026*	0.488	0.267–0.71
Coherence	2.77	0.71	3.11	0.63	6.77	0.001*	0.508	0.286–0.73
Average	2.97	0.66	3.30	0.64	7.24	0.001	0.516	0.293–0.738

* p < .05

Table II Descriptive statistics and independent t-test scores between Time 1 and Time 2 on Affective Perception of Destination Image

Affective Perception of Destination Image	Time 1		Time 2		t	p	d	95% CI (Lower-Upper)
	M	SD	M	SD				
Pleasant	2.77	0.73	3.12	0.82	5.21	0.031*	0.45	0.229–0.671
Interesting	2.61	0.77	2.7	0.88	1.01	0.321	0.116	–0.103–0.334
Exciting	2.89	0.82	2.73	0.66	–1.56	0.077	–0.216	–0.435–0.003
Active	2.65	0.86	2.78	0.63	1.33	0.275	0.173	–0.046–0.392
Relaxing	2.86	0.78	2.81	0.52	–0.96	0.330	–0.106	–0.325–0.112
Safe	2.59	0.64	2.52	0.71	–0.96	0.303	–0.103	–0.322–0.115
Average	2.73	0.77	2.78	0.70	0.90	0.452	0.074	–0.144–0.293

* p < .05

Pleasant (t=5.21, p=0.031), the effect size was medium (d=0.45). This fact may indicate that the changes caused by the project did not have such a strong impact on some aspects of affective perception, such as Interesting, Exciting, Active, Relaxing, and Safe. At the same time, the project has had a significant positive impact on the perception of the pleasantness of the environment among residents and visitors (Pleasant).

• **RQ3: Has the Project Changed Public Art Project Image among Residents and Visitors?** – In general, there are noticeable changes in the perception of the project by residents and visitors (Table III). Thus, on average, on the scale Public Art Project Image between Time 2 (M_{Time2}=2.92, SD_{Time2}=0.65) and Time 1 (M_{Time1}=2.63, SD_{Time1}=0.67), there are statistically significant differences (t=4.73, p=0.025) with a medium effect size (d=0.45). Five of the scale's six categories evaluated by residents and visitors for the period Time 2 are significantly higher than for the period Time 1: Dynamism (t=3.77, p=0.048), Sociability (t=6.59, p=0.004), Innovation (t=4.86, p=0.018), Creativity (t=9.19, p=0.001), and Quality of life (t=5.61, p=0.01). The effect size was large for Creativity (d=0.944), noticeable for Sociability (d=0.707), and medium for Quality of life (d=0.527) and Innovation (d=0.448). Despite its statistical significance, the effect size was small for Dynamism (d=0.223). For Significance of local traditions, there were no significant differences.

• **RQ4: Has the Project Changed Neighborhood Attachment for Residents and Visitors?** – According to the results of the statistical analysis, the project has changed significantly the Neighborhood attachment of residents and visitors: M_{Time1}=2.77, SD_{Time1}=0.76, M_{Time2}=3.05, SD_{Time2}=0.81, t=4.41, p=0.036, d=0.356 (Table IV). These data indicate stronger place attachment after the implementation of the project.

Discussion

The results of the study indicate that the project combining ecological urban planning and public art has changed the perception of environmental properties among residents and visitors. Due to the project, they perceive the environment as having more complexity, naturalness, typicality, openness, and coherence (RQ1). The results support the trends

TABLE III DESCRIPTIVE STATISTICS AND INDEPENDENT T-TEST SCORES BETWEEN TIME 1 AND TIME 2 ON PUBLIC ART PROJECT IMAGE

	Public Art Project Image							
	Time 1		Time 2		t	p	d	95% CI (Lower-Upper)
	M	SD	M	SD				
Dynamism	2.12	0.69	2.27	0.72	3.77	0.048*	0.223	0.004–0.443
Sociability	2.58	0.66	3.04	0.66	6.59	0.004*	0.707	0.482–0.933
Innovation	2.86	0.71	3.19	0.76	4.86	0,018*	0.448	0.227–0.669
Creativity	2.95	0.73	3.57	0.58	9.19	0.001*	0.944	0.714–1.175
Quality of life	2.81	0.59	3.11	0.55	5.61	0.01*	0.527	0.304–0.749
Significance of local traditions	2.44	0.65	2.36	0.64	–1.26	0,265	–0.124	–0.343–0.095
Average	2.63	0.67	2.92	0.65	4.73	0.025*	0.45	0.228–0.671

* $p < .05$

TABLE IV DESCRIPTIVE STATISTICS AND INDEPENDENT T-TEST SCORES BETWEEN TIME 1 AND TIME 2 ON NEIGHBORHOOD ATTACHMENT

	Time 1		Time 2		t	p	d	95% CI (Lower-Upper)
	M	SD	M	SD				
Neighborhood attachment	2.77	0.76	3.05	0.81	4.41	0.036*	0.356	0.136–0.576

* $p < .05$

identified in previous studies (Boffi et al., 2023; Hall and Robertson, 2001; Mitschke et al., 2017; Motoyama and Hanyu, 2014; Sharp et al., 2020). All these studies emphasize the positive impact of public art and ecological urban planning on the overall harmony of urban space. The conclusions are in line with the study by Motoyama and Hanyu (2014). These authors also advocate for the idea that public art changes the visual characteristics of the environment, affecting the perception of complexity and diversity (Complexity). Boffi et al. (2023) confirm that street art inspired by local history and culture can improve the perception of natural elements in the environment. These findings are consistent with this study on changes in the perception of Naturalness due to the project.

The project had an impact on creating a pleasant atmosphere in the area, but was insignificant in terms of other aspects related to the affective perception of the area (Interesting, Exciting, Active, Relaxing, and Safe) (RQ2). This fact may indicate that the project has primarily influenced the overall perception of the environment's pleasantness, without having such a significant impact on other emotional aspects. The conclusions about the improvement of pleasantness are consistent with the study by Sharp et al. (2020). These authors underlined the importance of a sense of pride and pleasantness as key components of the impact exerted by public art on the local population.

The results of the study show that the project has changed the perception of the public art project among residents and visitors (RQ3). The public art project has positively influenced its perception by residents and visitors, especially in aspects related to dynamism, social activity, innovation, creativity and quality of life. The revealed changes in the perception of the project's image correlate well with previously documented conclusions. There are numerous studies reporting that projects containing elements of creativity and art have a beneficial effect on the attractiveness of the urban environment (Cameron et al., 2020; Sharp et al., 2020). Innovations in urban space can also contribute to a positive perception among the population (Ji et al., 2021). The conclusions about the positive impact of the public art project on social activity and community perception (Sociability) are sufficiently consistent with previously published works (Askarizad and Safari, 2020; Sharp et al., 2020). These papers also highlight the importance of social interactions in an urban environment for the formation of a pleasant and perceived community. The obtained results suggest that

public art projects strengthen place attachment among residents and visitors (RQ4). The results broaden previous studies (Casais and Poço, 2023; Zhu and Chiou, 2022) that confirm the importance of cultural projects for the formation of positive feelings and connections with the environment.

Further research may focus on assessing the long-term effects of the project and its impact on environmental perception and quality of life. When developing future projects, it is recommended to include the local community in the decision-making. This measure can ensure their active participation and support.

Conclusions

Overall, the findings of the research emphasize the significance of incorporating public art and environmentally friendly design into urban space in order to enhance the standard of living and aesthetic allure of the city. The practical application of these approaches can contribute to the formation of more pleasant and comfortable urban spaces. Positive changes in the perception of dynamism and social activity emphasize the value of projects that promote communication and interaction in the city. Such initiatives can stimulate social and cultural events, increase social engagement, and create more connected communities. The results of the study indicate an increase in place attachment due to the project. This conclusion is important for the practice since a strong connection of residents and visitors to a place facilitates sustainable development and increases the level of participation in urban life. Despite the lack of statistically significant changes in relation to local traditions documented in this study, this aspect can be decisive for preserving and strengthening the city's identity in design practice.

The study recommends continuing to integrate public art and urban environmental design to create an interesting, diverse, and enjoyable urban space. When planning projects, it is necessary to pay attention to local traditions and cultural values for their preservation in the context of changes. Another essential aspect is the creation of conditions for social interactions in the urban environment. This approach better reflects the needs and preferences of residents, thereby increasing the effectiveness and sustainability of urban initiatives.

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Illustration sources

Figs. 1, 2 Compiled by the author based on the photos from Amazing Architecture

Fig. 3 Compiled by the author based on: Boffi et al., 2023; Brown and Perkins, 1992; Fornara et al., 2010; Motoyama and Hanyu, 2014

Author's biography

Diefan Wang is a dynamic researcher and educator. Currently a doctoral candidate and postdoctoral fellow at Changzhou University's School of Art and Design, Diefan delves into the affective perception of destination imagery and ecological urban planning. Simultaneously, as a professor at Southeast University's School of Art, Diefan fosters creativity and explores the intersections of public art and neighbourhood attachment.

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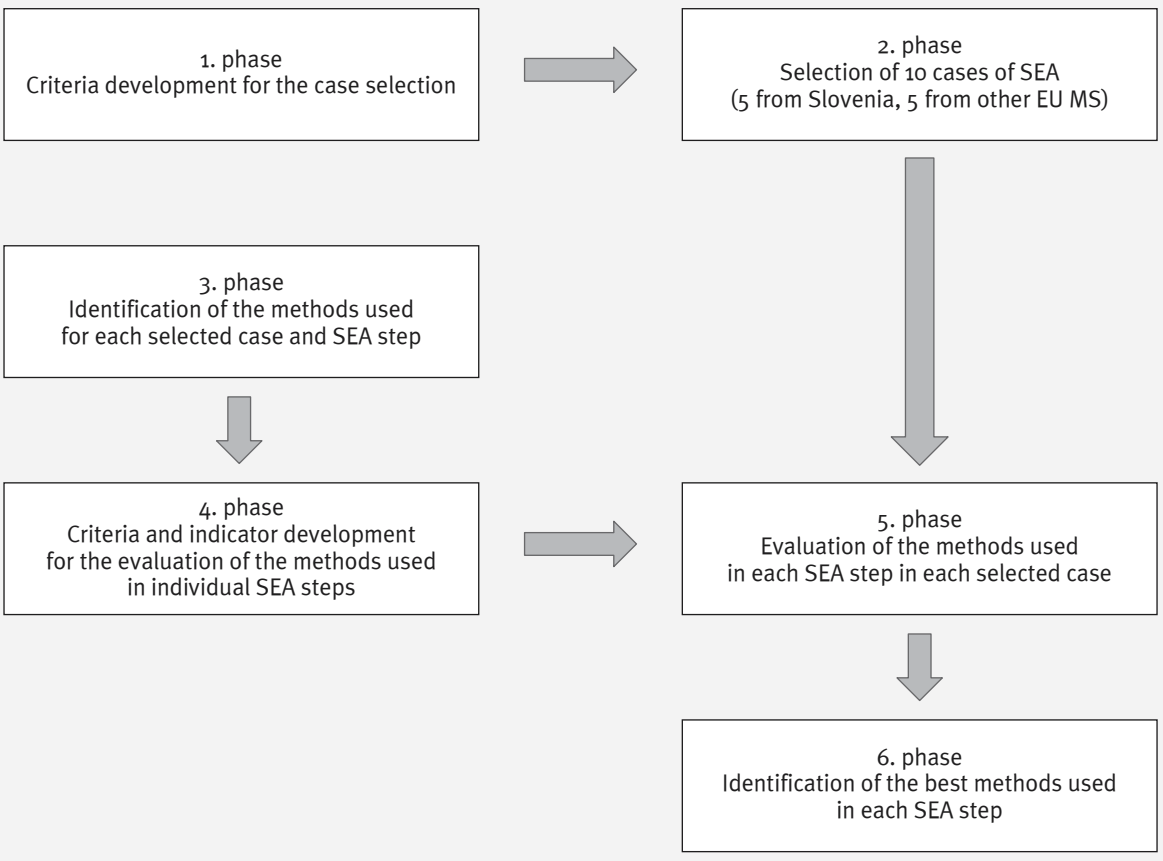
Fig. 1 Phases of the methodological approach



Vesna Kolar Planinšič[1], Alma Zavodnik Lamovšek[2]

[1,2] University of Ljubljana, Faculty of Civil and Geodetic Engineering, Jamova cesta 2, 1000 Ljubljana, Slovenia

[1] https://orcid.org/0000-0001-8688-5919

[2] https://orcid.org/0000-0001-6033-3358

vesna.kolar.planinsic@gmail.com
alma.zavodnik@fgg.uni-lj.si

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Efficiency of Strategic Environmental Assessment Methods in Municipality Land Use Plans

efficiency
land use plans (LUPs)
planning
SEA directive
Strategic Environmental Assessment (SEA)

The integration of environmental aspects in land use plans (LUPs) through SEA varies across Europe and their efficiency is still not well known, motivating the research of SEA implementation for LUPs. The main aim of the research is to evaluate the methods of integrating environmental aspects into LUPs, based on ten best practices, five from Slovenia and five from other EU Member States. The research methodology proceeds from the review of various literature and studies, on the basis of which we have developed fifty efficiency criteria and evaluated the methods used in the LUP for each step of the SEA: (I) scoping, (II) environmental report preparation, (III) consultations with ministries and public organizations responsible for specific environmental issues, (IV) public participation, (V) decision-making and (VI) monitoring. The research has shown that the methods used differ in scoping, consultations, public participation, and monitoring. We have identified the methods that are most effective in each SEA step. The research findings emphasise the importance of scoping and monitoring methods. The conclusion suggests further research of efficiency by questionnaire.

Introduction

Before 2003, land use plans (LUPs) in municipal projects rarely underwent a Strategic Environmental Assessment (SEA), resulting in significant environmental and health impacts as well as costly problems such as flooding, erosion and ecosystem damage. Due to the disregard of environmental aspects, the implementation of such plans with significant environmental and health hazards (EC, 2019: 1) as well as increased costs due to flooding, erosion, environmental disasters and ecosystem restoration (Judd, 2018: 1-10; EC, 2019: 1).

To mitigate these consequences and develop environmentally balanced LUPs, various methods and approaches have been scientifically investigated. In the search for optimal methods to integrate environmental goals into plans, programs and spatial strategies, numerous authors from Europe (Joao, 2004; Schmidt et al., 2005; Fischer, 2007, 2012; Ashemann, 2005; OECD, 2012; Sadler, Dusik, 2016; Therivel, 2019: 266-278) have advocated an ecological, strategic, gradual and transparent SEA approach. The main achievements of SEA include improved strategic decision-making in relation to plans and the formulation and evaluation of alternatives (Jones et al., 2005; Joao, 2005: 331-344; Koblar, 2004: 175-187; Cepuš et al., 2019).

A major milestone was the adoption of Directive 2001/42/EC of the European Parliament and of the Council on the Assessment of the Effects of Certain Plans and Programs on the Environment (hereinafter SEA Directive, 2001) and its transposition into national legal systems. The SEA Directive came into force simultaneously for all European countries that started to develop SEA methods, practices and research (Walsh, 2005; Sadler, Dalal-Clayton, 2010; Partidario, 2012; Pistotnik, 2017; Kolar Planinšič, 2021). It has been noted that appropriate methods are a prerequisite for effectiveness (Partidário et al., 2023) and that the long preparation and implementation time of the SEA increases substantive effectiveness. In 2003, the Protocol on strategic environmental assessment came into force in the UNECE[1] region (hereafter SEA Protocol, 2003)[2] too, supporting broader application.

To successfully conduct the SEA, various methods were applied within methodological steps, such as scoping, the preparation of environmental reports and engaging the ministries, organizations responsible for specific environmental protection issues and the public. The methods for carrying out the individual SEA implementation steps and their relationships have evolved according to the characteristics of individual regions (Partidario, 2012; Kolar Planinšič et al., 2013: 22; Sadler, 2016; Stenek et al., 2017: 95-100; Kolar Planinšič, 2017; Therivel, 2019: 266-278).

The question of which SEA methods are most appropriate for specific programs, plans and spatial strategies has already been raised by Noble, Gunn and Martin (2012) and the relationship with sustainability has been addressed by researchers and EU Member State (hereafter EU MS) authorities (Marsen, 1998; Environmental Protection Agency, 2012; Jacob et al., 2008; Mader, 2013; Schwab, 2021; Monteiro et al., 2017). Strategic thinking was emphasised by Partidario (2012) as an important prerequisite for efficient SEA. In addition, reliable data quality is one of the fundamental factors for effective SEA (Lazar, Podesser, 1999).

1 United Nations Economic Comission for Europe

2 On the 10th anniversary of the SEA Directive, European presentations stated that SEA is a key instrument for efficient environmental governance, which has a broad scope and content and is process oriented. Fundamental criteria for assessing effectiveness (the achievement of environmental goals, financial and resource efficiency, coherence, relevance and added value) were first set out in the SEA Directive evaluation study (European Commission, 2016). The second European study, SEA REFIT (European Commission, 2019), was the first to examine a broader sample of SEAs and identify a wider range of efficiency criteria, using the preservation and development of environmental standards and the relationship with other European directives, e. g. the Water Framework Directive (2000), the Habitat Directive (1992) and the Bird Directive (2010).

In this context, a particular challenge was seen in the lack of common evaluation criteria for the efficiency of SEA for LUPs. Therefore, authorities and practitioners could not analyse and compare the results or even improve them during the next planning period. Against this background, the research problem is to determine the criteria for evaluating the methods in each step of SEA and to identify the differences between the methods used in SEA for LUPs.

Therefore, the research question is: Which methods in the SEA steps (in scoping, SEA report preparation, public participation, consultations, mitigation measures and monitoring) are most appropriate?

Therefore, the aim of the study is to identify the effectiveness of best practise in SEA for LUPs. As SEA consists of methodological steps that incorporate environmental objectives into LUPs, the aim of our research is also to evaluate all methodological steps of SEA and identify the most effective and efficient methods within each step. Although various environmental evaluation systems in EU Member States are considered to have a common set of procedural requirements that contribute to an important level of environmental protection, these systems differ in their effectiveness and efficiency.

This research also considers the criteria of the second SEA REFIT study (EC, 2019), but focuses only on LUPs, which play a crucial role in sustainable development and climate change adaptation and considers the results of key studies to advance the SEA methodologies for these important spatial plans.

In the paper, we present the results on the effectiveness, efficiency, coherence, relevance and added value of the methods used in each SEA step, as well as the most effective methods. In the conclusion, we suggest further research on the topic of the paper.

For this research, the strategic environmental assessment means:

– the preparation of an environmental report, conducting consultations, taking the environmental report and the results of the consultations into account in decision-making and providing information about the decision;

– an important tool for integrating environmental considerations into the preparation and adoption of certain plans and programmes that are likely to have significant effects on the environment in the Member States, as it ensures that such effects of the implementation of plans and programmes are considered during their preparation and before their adoption.

Environmental impacts are defined as impacts on biodiversity, population, human health, fauna, flora, soil, water, air, climate, material assets, cultural heritage, landscape, and their interactions.

Methodology

In the study, we evaluate how the key methodological steps of SEA contribute to the integration of environmental objectives into LUPs in the period 2019-2023. These steps include (I) scoping, (II) preparing the environmental report, (III) consultations with ministries and organizations on environmental issues, (IV) public consultations, (V) decision-making on environmental impacts and (VI) monitoring.

To achieve this, we developed a two-part methodology (Fig. 1) with six phases based on existing research and studies. First, we established criteria for selecting examples of good practise and selected five from Slovenia based on their accessible data and five from other EU countries. Secondly, we developed criteria and indicators to evaluate the methods used in the different steps of SEA and applied them to all ten examples.

- **1. phase:** Criteria for selecting examples of good practise – In the first part of this phase, we used several criteria to select the cases from the EU Member States: (a) scientific papers on the topic are available in English, (b) the SEA systems are comparable, (c) the data are publicly accessible, (d) the environmental goals and indicators align, (e) the country demonstrates strong environmental performance, (f) the cases are from different climate regions, (g) the LUPs are for EU municipalities with fewer than 1.5 million inhabitants, (h) environmental aspects are fully integrated into the LUPs, and (i) the SEA authority recommends the case as an example of good practice example.

In the second part, we define criteria for the selection of SEA cases: (1) SEA is completed, (2) LUP has been adopted, (3) SEA is conducted in parallel with the development of LUP during the planning phase, (4) SEA is conducted within the LUP planning timeframe, (5) the SEA has defined a set of objectives and indicators during the scoping phase, (6) the environmental report was prepared according to the regulations and was of high quality, (7) the consultations with ministries and organizations were conducted professionally and within the deadlines, (8) public participation was effective, (9) objectives and indicators were set for all relevant environmental areas, (10) alternatives were assessed, (11) environmental aspects were

TABLE I EVALUATION CRITERIA, THEIR GROUPS AND RELATED NUMBER OF INDICATORS

Evaluation criteria in groups and sub-groups	Number of developed indicators in each group of criteria
I. Effectiveness	
I.1 Completeness and depth of the environmental report	11
I.2 Objectivity	4
I.3 Verifiability and transparency	4
I.4 Public participation	4
I.5 Compliance with legislation and standards	5
I.6 Mitigation measures	4
I.7 Regular monitoring	5
II. Efficiency	
II.1 Efficiency in financial and human resources inputs	5
III. Coherence	
III.1 SEA coherence	4
IV. Relevance	
IV.1 SEA relevance	2
V. Added Value	
V.1 Added value	2
Total number of criteria	**50**

integrated into LUP and recorded in regulatory units or spatial implementation conditions, (12) there were no appeals or lawsuits regarding the decision on environmental impacts and the SEA process was in line with the findings of the EU Court, (13) monitoring was proposed and (14) the area is located in different biogeographical regions.

- **2. phase:** Selection of good practices of SEA – Based on the criteria from the first step (Fig. 1), we selected five effective SEAs from Slovenia – Ljubljana, Novo Mesto, Ankaran, Bohinj and Rogaška Slatina — and five from other European countries: Graz (Austria), Varaždin (Croatia), Dublin (Ireland), Sintra (Portugal) and Copenhagen (Denmark).

- **3. phase:** Identification of the methods used for each selected good practise and SEA step – The methods for each SEA step were identified based on a literature review of known methods already used in the SEA steps, a review of environmental reports and other reports related to SEA and a review of 10 selected cases. Their relationship to the groups of evaluation criteria and related indicators is shown in Table II (Results chapter).

- **4. phase:** Development of criteria and indicators for the evaluation of the methods used in the individual SEA steps – The evaluation criteria were developed based on literature research and more than 20 years of experience[3] in SEA implementation. Five groups of criteria were defined: Effectiveness, Efficiency, Coherence, Relevance and Added Value. Indicators were developed for each criterion. Their number depends on the importance of the criterion (Table I).

- **5. phase:** Evaluation of the methods used in each SEA step in each selected case – Detailed evaluation indicators were developed for the appropriate evaluation of the cases: 37 detailed indicators for effectiveness, 5 for efficiency, 4 for coherence, 2 for relevance and 2 for added value. All 50 SEA indicators were used to evaluate all methods used in the selected cases and to identify the most successful methods for each SEA step. The SEA steps are as defined in SEA Directive and its implementation practise. They are as follows and presented in Table III: scoping (I.), preparation of environmental report (II), consultation with ministries and organisations (III), consultation with public (IV), environmental acceptability decision (V) and monitoring (VI). The results, the connectivity and relation to the SEA steps are shown together with the developed indicators in Table II.

For each method used in the 10 selected LUP cases, a rating was created for each indicator on a scale of 1 to 5, where 1 is inadequate, 2 is poor, 3 is good, 4 is very good and 5 is excellent. A detailed rating scale was developed for each indicator according to its content to make the ratings as objective as possible. After scoring all 10 cases, we calculated the average score for each individual method used. Table II shows the scores from 1 to 3 to indicate the areas where further development of SEA methods is needed.

In this section, we also clarify which individual methods are evaluated as verbatim quotations from the SEA Directive (2001), as otherwise various criteria such as effectiveness and efficiency could be misunderstood.

– Effectiveness evaluates the extent of the predetermined objectives in terms of a particular intervention, legal provision, act or series of acts (in this case the SEA Directive). The objectives that are the subject of the effectiveness evaluation are listed in Article 1 of the SEA Directive.[4]

It analyses the extent to which SEA has contributed to ensuring a high level of environmental protection in LUPs. As the effectiveness indicator is most complex, it has been divided and organised into the following seven sub-groups of indicators:

a) Completeness and depth of the environmental report
b) Objectivity
c) Verifiability and transparency
d) Public participation
e) Compliance with legislation and standards
f) Mitigation measures
g) Regular monitoring

– "Efficiency considers the relationship between the resources used by an intervention and the changes generated by that intervention (which may be positive or negative)." (EC, 2019: 76)[5]

– Coherence: In the research, we examine the extent to which the SEA Directive is coherent with other relevant EU environmental

3 Co-author Kolar Planinšić has 20 years of experience in SEA performance in Slovenia, Europe and UNECE as Chair of buro of the SEA Protocol, Member of European Commission Working Group on EIA/SEA and as Slovenian Competent Authority, responsible for tranposition and implementation, including quality assurance and capacity building.

4 "To provide for a high level of protection of the environment and to contribute to the integration of environment consideration into the preparation and adoption of plans and programmes with a view to promoting sustainable development, by ensuring that, in accordance with the directive, an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment." (EC, 2019: 56; SEA Directive, 2001: 1)

5 "It aims to provide an understanding of the extent to which the benefits of having and implementing the SEA Directive justify the costs. Both cost and benefits

legislation and sectoral policies as well as with the EU's international obligations.[6]

– "Relevance assesses whether the original objectives of the SEA Directive continue to meet the needs of current and future EU planning, assessment, and environmental policy."[7] (EC, 2019: 101)

– Added Value: "The assessment of EU added value considers the benefits and changes resulting from implementation of the SEA Directive that are additional to those that would have resulted from action taken solely at regional/or national level." (EC, 2019: 159)

• **6. phase:** Identification of the best practises (cases) used in each SEA step – The most effective methods were those that had been rated as most effective in the previous methodological phase and received an average score between 4.0 and 5.0 (Table II). We therefore identified the most effective methods for each step of the SEA separately. In this phase, individual SEA steps were linked to the stages of the LUP preparation process, where relevant, and summarised selected cases that proved to be the best practise for each method were applied (Table III in the Results chapter).

Results of the Evaluation of the Methods Used in Relation to the Selected Indicators and Criteria

The results of the evaluation (Table II) show that all the methods used are of a fairly high standard, with the average rating of each method for all the selected cases nowhere below 2.6 (the SEA report suggests monitoring) and a very large number of indicators achieving the highest rating of 5 (22 out of 50). Overall, the selected cases are balanced for most indicators, with only a few showing significant deviation. This is generally the case for the good practise examples, where individual indicators are rated with the lowest scores (2 and 3) and the range of scores for all case indicators is from 2 or 3 to 5.

A more detailed presentation of the results for each group of criteria and indicators follows later in this chapter, focusing on the evaluation of the results for each group of criteria and indicators with the link to the SEA steps (Table II).

– Effectiveness – The results on effectiveness in achieving environmental goals show that the integration of environmental aspects in LUPs in Slovenia and other EU countries is of high quality, with only minor deviations. Differences exist in terms of climate change and water.

Biodiversity is one of the most methodologically advanced areas. Other environmental aspects are well integrated, although methods vary in terms of precision and detail. Environmental reports from larger cities such as Ljubljana (Janković et al., 2021), Varaždin, Sintra, and Copenhagen are rather general, with a medium level of detail. In contrast, places such as Rogaška Slatina, Bohinj, Ankaran, Dublin, and Graz use more precise methods, focusing more on cultural heritage and urban content. This suggests that methods for evaluating environmental reports are tailored to the level and content of the plans. There are no significant differences in structure or goals, nor in the way they relate to other plans. The environmental characteristics are clearly described in nine out of ten cases, with only minor deviations in one. All cases address key environmental aspects, particularly those related to ecological sites under the Habitat (1992) and Birds Directives (2010), showing strong compliance with European and national environmental goals.

There are notable differences in the assessment of likely significant environmental impacts, such as effects on biodiversity, population, human health, fauna, flora, soil, water, air, climate, material assets, cultural heritage, landscape, and their interactions. While 5 out of 10 cases cover these areas thoroughly, in some cases one or two aspects are either vaguely or inadequately assessed.

Regarding the indicator of mitigation measures, these are listed and partially described in all cases, but their feasibility is either not mentioned or is insufficiently evaluated.

Inadequacies can be found in some cases in the reasons for choosing the considered alternatives and the description of the evaluation process and any difficulties encountered. There are clear differences in monitoring, where 80% of the measures are listed and partially described, but only 20% are fully described and monitored.

can be monetary and non-monetary. The evaluation of efficiency also needs to provide an understanding of the factors that influence efficiency and look the administrative burden the Directive imposes on key stakeholders, such as public authorities." (EC, 2019: 76)

6 "Evaluating the coherence of legislation, policies and strategies means assessing if they are logical and consistent with each other and with other legislation, as well as with relevant policies. This included determining whether there are significant contradictions or conflicts that stand in the way of their effective implementation, or which prevent the achievement of their objectives." (EC, 2019: 113)

7 „It looks at whether the objectives of the legislation remain necessary and appropriate, and if the objectives and requirements set out in the Directive are still valid in contributing to sustainable development." (EC, 2019: 101)

TABLE II EVALUATION MATRIX OF 50 SEA CRITERIA

SEA STEP	I	CRITERIA	Case 1	2	3	4	5	6	7	8	9	10	A
EFFECTIVENESS													
Completeness and depth of the environmental report													
I., II.	1	Content	5	5	5	5	5	5	5	5	5	5	**5**
I., II.	2	Environmental state	4	4	4	5	5	5	5	5	5	4	**3.6**
I., II.	3	Possible impacts	5	5	5	5	5	5	5	5	5	4	**4.9**
I., II.	4	Environmental problems	5	5	5	5	5	5	5	5	5	5	**5**
I., II.	5	Environmental aims	5	5	5	5	5	5	5	5	5	5	**5**
II.	6	Environmental effects (nature/biodiversity, water, floods, air, cultural heritage, health, climate)	4	4	5	5	5	4	4	5	5	4	**4.5**
II.	7	Mitigation measures	4	5	5	5	4	3	3	4	4	4	**4.1**
II.	8	Alternatives	4	4	4	4	4	3	3	5	3	3	**3.7**
VI.	9	Monitoring measures	4	4	4	4	4	5	4	4	5	4	**4.2**
II.	10	Non-technical summary	3	3	3	3	3	4	4	5	4	4	**3.6**
II.	11	Cumulative effects	3	3	4	4	4	4	4	4	4	3	**3.7**
Objectivity													
II.	12	Scientific approach	3	3	4	4	4	5	4	4	5	4	**4**
II.	13	Objectivity of data base	5	5	5	5	5	5	5	5	5	5	**5**
II.	14	References	4	4	4	5	5	5	5	5	5	5	**4.7**
II.	15	Cooperation of science	2	2	2	3	5	3	3	5	3	2	**3**
Verifiability and transparency													
	16	Process description and verifiability	5	5	5	5	5	5	5	5	5	5	**5**
V.	17	Publication of SEA report and LUP	5	5	5	5	5	5	5	5	5	5	**5**
IV.	18	Anyone can have an insight into the procedure	5	5	5	5	5	5	5	5	5	5	**5**
III.	19	The opinions of ministries and organizations are summarized and the whole process is described in the decision on Environmental acceptability/final decision	5	5	5	5	5	5	5	5	5	5	**5**
Public participation													
IV.	20	SEA report is publicly available with invitation for comments	5	5	5	5	5	5	5	5	5	5	**5**
IV.	21	Reasonable time	5	5	5	5	5	5	5	5	5	5	**5**
IV.	22	Public answers to public comments	5	5	5	5	5	5	5	5	5	4	**4.9**
IV.	23	Comments considered	4	5	4	5	4	5	5	5	4	4	**4.5**
Compliance with legislation and standards													
II., III., IV., V., VI.	24	All national legislation considered	5	5	5	5	5	5	5	5	5	5	**5**
II., VI.	25	EU legislation considered	5	5	5	5	5	5	5	5	5	5	**5**
II., VI.	26	International legislation considered	5	5	5	5	5	5	5	5	5	5	**5**
II., VI.	27	Standards considered	4	5	5	5	5	5	4	4	4	4	**4.5**
VI.	28	No complaints or court procedures	4	5	4	5	4	5	5	5	5	5	**4.7**
Mitigation measures													
II.	29	SEA report proposes mitigation measures	4	4	4	4	4	4	4	4	4	4	**4**
II.	30	Mitigation measures are feasible and technically justified	3	5	4	5	5	5	5	5	5	5	**4.7**
II., VI.	31	Mitigation measures are applicable to the LUP	5	5	5	5	5	5	5	5	5	5	**5**
II., VI.	32	Mitigation measures are included in the LUP	4	5	5	5	5	5	5	4	5	4	**4.7**
Monitoring													
II.	33	SEA report proposes monitoring	3	3	3	3	3	3	3	1	2	2	**2.6**
VI.	34	Monitoring is set out in the decision on environmental acceptability/final decision	5	5	5	5	5	5	5	5	5	5	**5**
VI.	35	Municipality/city conducts monitoring	4	4	4	4	4	4	5	4	5	4	**4.2**
VI.	36	Monitoring report is sent to SEA authority or is public	3	3	3	3	3	5	4	5	5	3	**4.0**
VI.	37	Monitoring is used for future LUP changes	5	5	5	5	5	5	5	5	5	5	**5**
EFFICIENCY													
Efficiency in financial and human resources inputs													
II.	38	The environmental report does not exceed the costs of the LUP	5	5	5	5	5	5	5	5	5	5	**5**
I.-VI.	39	SEA is conducted within a reasonable time	5	5	4	4	2	5	5	5	5	5	**4.5**
I.-VI.	40	Highly professional staff in the municipality	5	5	5	4	4	5	5	5	5	5	**4.8**
I.-VI.	41	Highly professional staff at the ministry, responsible for SEA	5	4	4	4	4	5	5	5	5	5	**4.6**
I.-VI.	42	Highly professional staff at the ministries and organizations involved in SEA	4	4	4	4	4	4	4	4	4	4	**4**
COHERENCE													
I., II.	43	The Environmental Report complies with the Habitats Directive	5	5	5	5	5	5	5	5	5	5	**5**
I., II.	44	The Environmental Report complies with the Bird Directive	5	5	5	5	5	5	5	5	5	5	**5**
I., II.	45	The Environmental Report complies with the Water Framework	5	5	5	5	5	5	5	5	5	5	**5**
I., II.	46	The Environmental Report complies with the Flood Directive (2007)	4	5	5	4	4	5	5	5	5	4	**4.6**
RELEVANCE													
II.	47	SEA responds to current environmental issues	4	4	4	4	4	4	4	4	4	4	**4**
II.	48	SEA assesses all essential environmental content	4	5	5	5	5	5	5	5	5	4	**4.8**
ADDED VALUE													
II., VI.	49	SEA proposes alternatives or modifies the plan to ensure that it is environmentally acceptable / no adverse effects on the environment	5	5	5	5	5	5	5	5	5	5	**5**
II., III., IV., V., VI	50	**SEA greens the plan and contributes to sustainable development**	5	5	5	5	5	5	5	5	5	5	**5**

Legend: I – index; A – average

No.	Case	No.	SEA step
1	SEA for Land Use Plan Ljubljana	I	scoping
2	SEA for Land Use Plan Novo Mesto	II	preparation of environmental report
3	SEA for Land Use Plan Ankaran	III	consultations with ministries and public organizations responsible for specific environmental issues
4	SEA for Land Use Plan Bohinj		
5	SEA for Land Use Plan Rogaška Slatina		
6	SEA for Land Use Plan Graz	IV	public consultations
7	SEA for Land Use Plan Varaždin	V	decision-making and the final decision on environmental impacts
8	SEA for Land Use Plan Dublin		
9	SEA for Land Use Plan Sintra	VI	monitoring
10	SEA for Land use Plan Copenhagen	II.	preparation of environmental report

A non-technical summary is present in all cases and contains all the necessary content. However, the readability and the degree of justification vary.

In evaluating the applied methods, particular care has been taken to ensure that the impacts have been considered in scoping, the environmental report, consultations and integration into the LUPs. In all cases these impacts are listed and include all types of impacts, however, they are incomplete in 2 cases and slightly incomplete in 7 cases. The survey confirms that the authors consider these impacts to be irrelevant and prefer not to "burden" the environmental report. However, this lack of transparency requires adequate clarification during scoping to avoid overlooking potential mitigation or monitoring measures. In most cases, the positive impacts are also not adequately highlighted.

The objectivity criteria show that the environmental reports are professionally justified but differ in their scientific justification. In 2 cases the scientific justification is present but partially incomplete; in 6 cases it is largely justified but some content still raises scientific doubts; in 2 of the remaining cases the reports are fully justified. Objective data sources were available in all cases and were fully considered, demonstrating the objectivity of the presentation of environmental conditions. The references achieve a rating of 4-5 in all cases.

The process is clear, transparent, and fully verifiable in all cases. The LUPs were published online for public access and review, and the opinions of the ministries and organizations were summarized in the final environmental acceptability or alternative decision. The procedures followed in the cases observed were transparent and met the criteria.

The results of public consultation show varying levels of public involvement, from fulfilment of the minimum requirements to broad public cooperation. In all cases, the LUPs were published on a designated website, where the public could submit comments online, attend workshops and participate in public hearings. Specific deadlines and contact information were provided for submitting comments, which were then compiled and publicly responded to. In all cases, comments were considered in full or to the extent possible. In 5 out of 10 cases, some comments could not be fully addressed but considered where possible.

The methods for submitting and considering comments vary widely. The methods for public hearings at the drafting phase differ considerably from those for early public participation before the plan is drawn up. Initiative-taking public participation took place systematically in the LUPs for the municipalities of Dublin (SEA Guidance, 2020), Graz (Raumplanung Steiermark, 2009; Pistotnik, 2017; Schwab, 2021), Sintra (Partidario, 2018; Partidário, Monteiro, 2019), Rogaška Slatina and Ankaran. Partial own-initiative participation took place in Ljubljana (scoping) MOL (2018) and Copenhagen, while official public hearings were held elsewhere during the drafting phase.

In all cases, all national and EU legislation was fully implemented. Mitigation measures were proposed in the environmental reports and included in the LUPs. In 8 out of 10 cases, the proposed mitigation measures were fully taken into account. In 3 cases, the measures were largely taken into account and in 7 cases they were fully taken into account.

The result of the regular monitoring shows differences. In one case, the environmental reports did not provide for any monitoring at all and in 3 cases the monitoring was only minimal. In 6 cases, partial monitoring was carried out. In 8 cases, the monitoring was mainly carried out by the municipalities, but only in 2 of them (Graz and Dublin) the results are published transparently.

– Efficiency – The evaluation of the financial and personnel costs was difficult due to the different data from publicly accessible information and surveys. However, it is evident that the preparation of the LUPs required significant financial investment, while the SEA report was cost-effective in all cases.

The SEA was conducted within a reasonable period of up to four years in 7 cases, four to five years in 2 cases and six to seven years in 1 case. In 1 case, the duration was influenced by external factors and staff shortages. The municipalities provided at least one full-time employee in 2 cases and at least two full-time employees in 8 cases. Higher efficiency was observed when two employees were involved.

Among ministry staff, higher efficiency was observed when more than one person was employed for a period of four-month, which was the case in 6 out of 10 cases. In 4 cases, only one person was engaged for a four-month and efficiency was lower.

Official representatives of ministries and organizations (up to 40), experts, authors, reviewers and municipalities participated in the SEA processes. Other authors participated in the preparation of the LUPs. Active participation and co-operation led to the most efficient results. Efficiency was achieved in 9 cases through active communication and co-operation in spatial planning and environmental assessment, which had a positive impact on decision-makers.

– Coherence – In all cases, the environmental reports follow the Habitats Directive (1992), the Birds Directive (2010) and the Water Framework Directive (2000). Appropriate evaluations are detailed and transparent. There are some differences in the evaluation of compliance with the Floods Directive (2007), particularly in the detailed explanations and the graphical presentation. The explanation and transparency of the assessment methods are more precise if the database on the state of water bodies and the hydrological model were previously created in the initial planning phase and therefore used in the scoping and the SEA report.

In the case of Ljubljana, Copenhagen and Rogaška Slatina in particular, climate change was considered using a combination of meteorological data and holistic climate change models. In Ljubljana climate change mitigation measures were proposed in the plan and the so-called "new graveyard area" in the plan was accepted with the remark that it can only be used once the climate change mitigation measures will have been implemented on site, which is about 10 years later.

– Relevance – SEAs respond to current environmental issues in all key areas such as environment, cultural heritage, landscape, water, population and health. Due to climate change the average rate is 4 but is considered holistically. The more exact measure on climate change could include different long-term alternatives near coastal areas (Copenhagen). The climate change mitigation measures related to landscape, population and health are very well integrated into the plan of the same city, such as large green areas, green structures and renaturation areas, as the essential environmental context has been assessed. As can be seen from the documentation, the relevance of the SEA methods is high in all SEAs, as all current environmental issues are considered (rate 5), apart from climate change mitigation measures. As land use planning is the only planning that defines land use at the municipal level, this is the only planning area where the creation of measures is possible.[8] Climate change in general is mentioned in the SEA reports, but in individual SEAs climate change is not considered as much as other issues, and therefore the common rate is 4.

In terms of cultural heritage, the relevance of the methods is the highest in Dublin, Copenhagen, Graz, Varaždin, Sintra and Rogaška Slatina. The relevance of the methods that take climate change into account achieves medium rates and is not completely transparent. Further investigation is therefore required.

– Added value – The results show that all SEAs propose alternatives or modify the LUPs, formulate the LUPs greener and contribute to sustainable development. They represent national and European added value. In all 10 SEA cases, alternatives or mitigation measures are proposed and the LUPs are modified. The SEAs amend the plan to ensure that it is environmentally sound and does not have a negative impact on the environment. The results of the evaluation show that the added value from the documentation is seen with up to the highest rate of 5.

THE BEST METHODS IN THE SEA STEPS

Based on the analysis of all methods in relation to the previously developed criteria and indicators, this chapter highlights the best methods used in the SEA steps (Table III). The success of the individual steps (I to VI) and the overall SEA process depends on the combination of methods and the co-operation of all parties involved. The methods used differ in the degree of stakeholder involvement, which can be open (inclusive) or closed (non-inclusive), with inclusive methods having a higher degree of effectiveness.

I – Scoping methods – Seven (Table III) methods were identified as the most effective for scoping (I. SEA step), which can also be used in combination with each other:

– Two of them, internal and external interdisciplinary scoping methods are fundamental and should always be used as they form the basis for the further proper assessment of SEAs. An interdisciplinary team must work on both the scoping and SEA.

– The consultation method, where proper goals and indicators are named, is an enhancement and should be supported by the thematic scoping workshops, which are also one of the best scoping methods.

– The scoping workshop method helps to find key issues and cut irrelevant issues to ensure that the SEA focuses on the most important challenges.

– Internal and external consultation methods are also needed to properly develop the assessment method and present it to the stakeholders.

– The survey method shows critical decision factors, helping to avoid unforeseen issues

8 The Strategy for Climate Change gives directions generally and specifically for sectors and aims to transform the EU into a climate-neutral area by 2050. National energy and climate change plans give more directions generally and specifically for sectors considering all countries to become climate-neutral by 2030 with a view to 2050. Land use plans are created with the purpose to implement the land use and measures in reality in next one to five years, so the climate change measures must be written in the plan and appropriate mitigation measures must be formulated.

Table III The most effective and efficient methods for the transparent integration of environmental considerations into the SEAs for the LUPs

SEA steps	SEA methods	LUP phase	Case
I. Scoping	The method of internal interdisciplinary scoping.	Aims of a LUP. Indicators of a LUP. Definition of an alternative.	Ljubljana, Ankaran, Sintra, Dublin, Graz, Copenhagen, Ljubljana, Varaždin
	The method of external interdisciplinary scoping.		Ljubljana, Graz, Dublin, Copenhagen
	The consultation scoping method for settling the relevant aims and indicators for environment, nature, landscape, cultural heritage, water.		Ljubljana, Bohinj, Ankaran, Sintra, Dublin
	Thematic scoping workshops.		Ljubljana, Graz, Copenhagen
	The internal/external consultation method for settling the SEA evaluation method.		Sintra, Dublin, Graz
	The survey method for identification of critical decision factors.		Sintra
	The strategic thinking method for identification of alternatives with planning and environmental experts.		Sintra
II. Preparation of the environmental report	The method of literature survey to show environmental problems.	Preparation of a LUP draft. Integration of environmental issues/alternatives into a LUP.	Bohinj, Rogaška Slatina, Ljubljana, Ankaran, Graz, Varaždin, Copenhagen, Dublin
	The method of internal interdisciplinary teamwork.		All cases
	The survey method.		Sintra
	The method of external consultation workshop.		Rogaška Slatina, Ljubljana, Dublin
	The method of external independent scientific checking/quality assurance.		Sintra
III. Consultations with ministries and public organizations	The method of written consultation with ministries/organisations.	Consultation with ministries and organisations.	All cases
	The method of on-site consultation with ministries/organisations.		Ljubljana, Graz, Copenhagen
	The method of workshop consultations with ministries/ organisations.		Ljubljana
IV. Public consultations	The method of written public consultation (on-line, time).	Public consultation. Preparation of answers on how the comments were considered.	All cases
	The method of site-by-site presentations and public consultation.		Ljubljana, Novo Mesto, Bohinj, Ankaran, Rogaška Slatina, Graz,
	The method of thematic focus meetings.		Ljubljana, Ankaran, Graz, Dublin, Copenhagen
	The method of location workshops, walking tours.		All cases
	The method of interdisciplinary consideration of comments.		All cases
	Personal written information on considering comments.		Graz
V. Decision-making and the final decision on environmental impacts	The method of actively taking comments from III and IV. SEA steps into account.	Integration of all SEA topics into a LUP. Integration of mitigation measures into a LUP. Integration of monitoring into a LUP. Acceptance of a LUP. Final decision making.	Ljubljana, Bohinj, Ankaran, Graz, Dublin, Copenhagen
	The method of thematic meetings.		Ljubljana
	The inclusive method of preparation of environmental acceptability approval.		Ljubljana, Novo Mesto, Bohinj, Ankaran, Graz, Dublin, Copenhagen
VI Monitoring	The regular municipal monitoring methods.	After a LUP adoption.	Ljubljana, Novo Mesto, Copenhagen, Graz
	Case by case monitoring methods.		All cases
	Public monitoring methods used for next LUPs.		Graz

and shorten the timeline. Without systematic identification, stakeholders may have differing views, lengthening the process and reducing transparency and efficiency.

– The strategic thinking method of identifying alternatives with planning and environmental experts helps to develop alternatives and identify the real challenges of the SEA that require a qualified, independent expert.

II – The SEA report preparation methods – Five methods for the preparation of the environmental report were identified in the SEA report phase:

– The literature review method, which helps to identify environmental problems and the method of internal interdisciplinary teamwork are two basic approaches used in all cases.

– The interdisciplinary teamwork of different experts, including local experts, is a key factor for a methodological efficiency. The simultaneous application of both methods represents an efficient approach.

– The survey method proves to be particularly useful and effective for complex new land uses, such as the assessment of new location alternatives for large energy or transportation infrastructure.

– The external consultation workshop method is an advanced approach that facilitates the identification of environmental issues and the alignment and focussing of indicators. This method is inclusive and highly efficient, albeit time-consuming, and it increases the legitimacy of the results.

– The method of external independent scientific review / quality assurance and consultation of the process is innovative and leads to better, scientifically validated results. Although it has only been used in one case, it has the potential to be combined with the four methods above mentioned when dealing with complex LUPs.

III – Methods for consultations with ministries and public organizations responsible for specific environmental issues – The three most effective consultation methods with ministries and organizations are written consultations, on-site consultations, and workshops. Written consultations were used in all 10 SEA cases, as they are the basic method that ensures legitimacy. On-site consultations and thematic workshops were used in 8 cases and make the process more efficient, especially for complex SEAs. These methods help to focus on key issues and avoid critical decision factors by addressing problems directly on site and through group discussions.

IV – Public consultation methods – There are six very efficient methods:

– The first and most basic is written public consultation, where LUPs are published online, and a clear time is given for comments. It has been effective in all cases where the online publication is known to the public and the practise is encouraged and easy to evaluate as well as transparent and published on a SEA website describing the whole process.

– The method of site-by-site presentations and public consultations is another method that was used in all cases.

– The method of thematic focus meetings, which was used in 6 cases, helps to introduce new or challenging land use to the public, and is therefore an extension of the first two methods.

– The method of location workshops and the method of walking tours were used in half of the cases where there were numerous alternatives or ideas, mostly for settlement areas and their organisation.

– The combination of all five SEA methods is the most efficient and helps to make the LUPs more democratic and acceptable.

– The method of interdisciplinary review of comments was used in all cases. A written statement of how the comments were considered was prepared and published. The authorities have taken note of the comments as far as possible. The response to the comments was written and published in all cases. In 1 case, the responses were also sent to the persons concerned.

V – Decision-making and the final decision on environmental impacts – The inclusive method of preparing the environmental acceptability assessment, which considers all comments from steps III, IV, V, is recommended to maintain transparency and legitimacy. It is crucial to actively review all written comments, address them professionally, and carefully consider each one. If contradictory points arise, they should be confronted and clarified with a more detailed approach. In such cases, thematic meetings or round tables are effective methods to resolve differences and ensure a thorough discussion.

VI – Monitoring methods – In all cases, the SEA reports included monitoring methods, although some focussed only on the monitoring of mitigation measures. Overall, the monitoring methods were weak and not fully integrated, except in one case. There are no publicly available monitoring reports. The SEA monitoring of a LUP should be conducted over a five-year implementation period, an area requiring further research and development. Regular municipal monitoring methods were only used in 4 cases, published in 3 cases, and provide a good basis for ongoing planning and future SEAs.

Conclusion

The evaluation of the criteria related to the methods used in the SEA steps for the ten European LUPs proves the overall effectiveness of SEA in terms of management, organisation of interdisciplinary teams for the preparation of LUPs and SEAs, process solutions and sustainable orientation of city planning authorities. However, there are some weaknesses in dealing with climate change and flooding, which need to be further analysed.

The 50 evaluation indicators cover all aspects, from methodology to process and management, and are recommended for the evaluations of SEAs for LUPs. The methods used in the 10 SEAs are categorical and differ significantly from the observed examples of good practise but remain within the framework of the SEA Directive. There are four areas where the differentiation of methods is the greatest: a) Scoping, b) Public participation, c) Mitigation measures, d) Monitoring.

To improve SEA, it is recommended to strengthen existing laws and regulations, improve participatory methods, explore new digital tools, conduct more research on SEA effectiveness, particularly its impact on decision-making, and encourage innovative sustainability practises.

Recognising that no general conclusions can yet be drawn, we she proceed with an in-depth study based on a questionnaire survey and in-depth interviews with experts from different European countries to further explore the possibility of developing an optimal model for the SEA of LUPs.

[Proofread by Kristina Pervanje Vrčon]

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Source of illustration and tables

Authors

Authors' biographies and contributions

Vesna Kolar Planinšič, Ms.C. of spatial planning specialized in environmental assessments and development of the national system. Her research area is quality of strategic, habitats and transboundary environment impact assessment.

Assoc. Prof. **Alma Zavodnik Lamovšek**, Ph.D. She graduated in 1992 and continued her postgraduate studies in spatial planning. Her current research interests include land use, climate changes and regional development.

Conceptualization: V.K.P. and A.Z.L.; methodology: V.K.P. and A.Z.L.; formal analysis: V.K.P.; investigation: V.K.P.; resources: V.K.P.; writing – original draft preparation: V.K.P.; writing – review and editing: V.K.P. and A.Z.L.; visualization: V.K.P. and A.Z.L.; supervision: A.Z.L.

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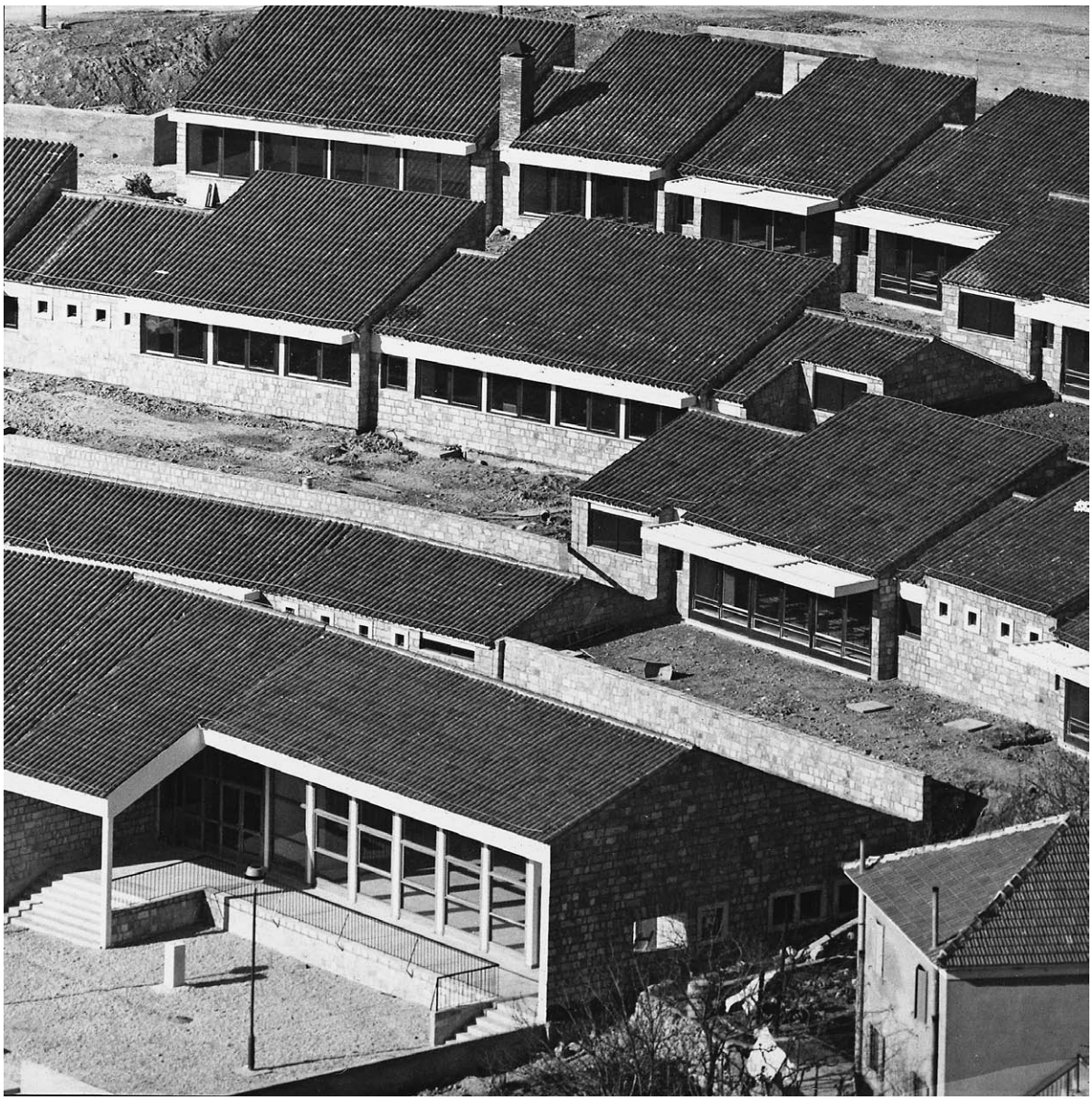

Fig. 1 Kajo Gizdić (today's Petar Kružić) primary school in Klis

Snježana Perojević

University of Split, Faculty of Civil Engineering, Architecture and Geodesy, Matice hrvatske 15, 21000 Split
https://orcid.org/0000-0002-5105-7467

snjezana.perojevic@gradst.hr

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Jerko Marasović's Architectural Designing Achievements
From Modernism to Critical Regionalism

Critical Regionalism
designing work
Marasović, Jerko
Modernism

Jerko Marasović was an outstanding, internationally recognized expert in the field of architectural heritage. However, his designs for new architecture remain largely unknown. This paper aims to consolidate what is known about his lifelong work. Its objective is to analyze and contextualize his architectural contributions, which span the spectrum between Modernism and Critical Regionalism, within the framework of their development. All available graphic and textual materials related to the designs were studied and relevant literature was consulted. To support his affiliation with the direction of Critical Regionalism, this paper briefly presents its key features and discusses its relevance today. An analysis of Jerko Marasović's designs revealed their generally high quality. He developed his concepts through a profound understanding of the layers and characteristics of Dalmatian architecture, as well as a consistent application of an analytical, rational, and responsible design process, in line with his own scientific ethos. By employing this approach, he created an architecture that can be classified as Critical Regionalism, even prior to the theoretical definition of that direction.

INTRODUCTION

The celebration of the centenary of the birth of architect Jerko Marasović in 2023 was an opportunity to review his life's work. On that occasion, a book was published with a detailed representation of his professional work achievements including his biographical data (Marasović, 2024). As expected, the focus of the review of his work achievements was in the field of scientific research, development of proper methodology for the processing of architectural heritage, and work on protection, restoration, and presentation of architectural heritage. The overall review has shown the versatility of his work, as well as the achieved high quality in every segment he dealt with. Thus, in addition to showcasing his world-renowned work on architectural heritage, primarily concerning Split and Diocletian's Palace, this paper pays particular attention to his designs for new constructions and extensions in their contextual framework. This context encompasses a complex historical and spatial situation, whether regarding architectural elements or construction within predominantly natural environments, ranging from designs situated among mainly vernacular architecture to those within the realm of highly valuable stylistic architecture, including sites listed on the UNESCO World Heritage List. The publication also offers a brief overview of this aspect of Jerko Marasović's work, which raises the need for a more thorough examination of his contributions and their positioning within the architectural trends of his time. Although not extensive, the quality of this work warrants further discussion, as highlighted in this paper. Some designs are entirely in the spirit of Modernism, primarily focusing on unfinished projects. As expected, the most significant achievements relate to architecture in context, and their analysis questions their placement within the era in which they were created while also contextualizing them within the framework of Critical Regionalism.

DETERMINING ELEMENTS OF THE DESIGN PROCESS OF JERKO MARASOVIĆ

The key elements that determined his architectural expression were primarily his birth and life spent in Split, which encouraged a lifelong orientation and awareness of the value of the historical remains and architectural layers of this city; but equally his formal education at the Technical Faculty Architecture Department in Zagreb. He graduated in architecture in 1952, and studied under the guidance of several respected modern architects and experts in the field of theory and history of architecture and art, such as, in alphabetical order: Albini, Boltar, Cota, Denzler, Kauzlarić, Mohorovičić, Seissel, Stahuljak, Strižić, Šegvić, Turina and Vrkljan (Obad Šćitaroci, 2000: 342). Therefore, these two poles – historical architecture and modernist education – defined his architectural vocabulary. Jerko Marasović formed his judgments, attitudes, and conclusions – regardless of the field of activity – based exclusively on a consistent application of scientific methods. He rigorously tested, examined, and analyzed a problem or topic down to its core. Only after this thorough investigation did he draw his own conclusions and take action. He approached his work as both a designer of modern interventions in spaces and as a creator of additions to existing architecture with the same level of diligence and scrutiny. This primarily implies that his architecture cannot be viewed in the light of trends or stylistic tendencies; his architectural response to the problem of the function and context was based, apart from the designing influence of the aforementioned education which certainly defined his designing attitudes, on the application of his own conclusions as to what the response should be in each individual situation.

DESIGNS IN THE SPIRIT OF MODERNISM

In these designs, executed at the level of preliminary sketches, Jerko Marasović communicated in the language of modernity, situating

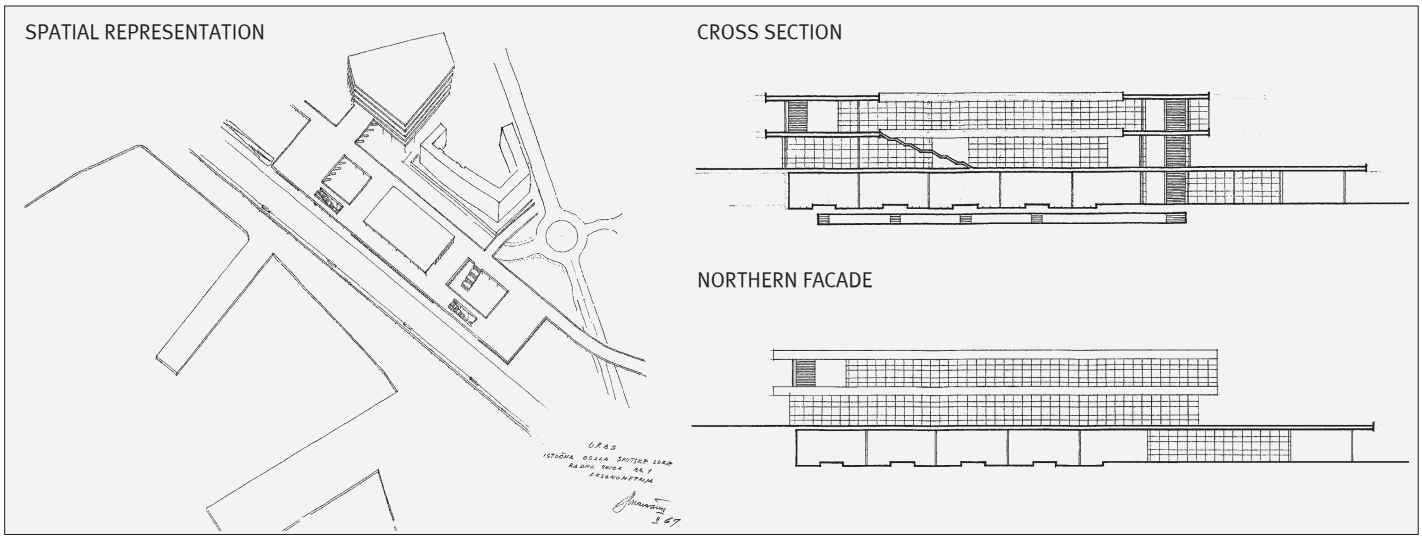


Fig. 2 Programme study of the Transport and business facility on the East coast of the Port of Split – spatial representation

his work within various spatial contexts. It is particularly interesting to examine the author's architectural responses to the location, content, and themes involved. The designs are presented across a spectrum, ranging from urban-scale concepts to detailed elements, and are organized chronologically from newer to older. Among these works is a renovation design for a medieval monastery in Poljud, Split, which serves as an example of architectural intervention within existing historical architecture.

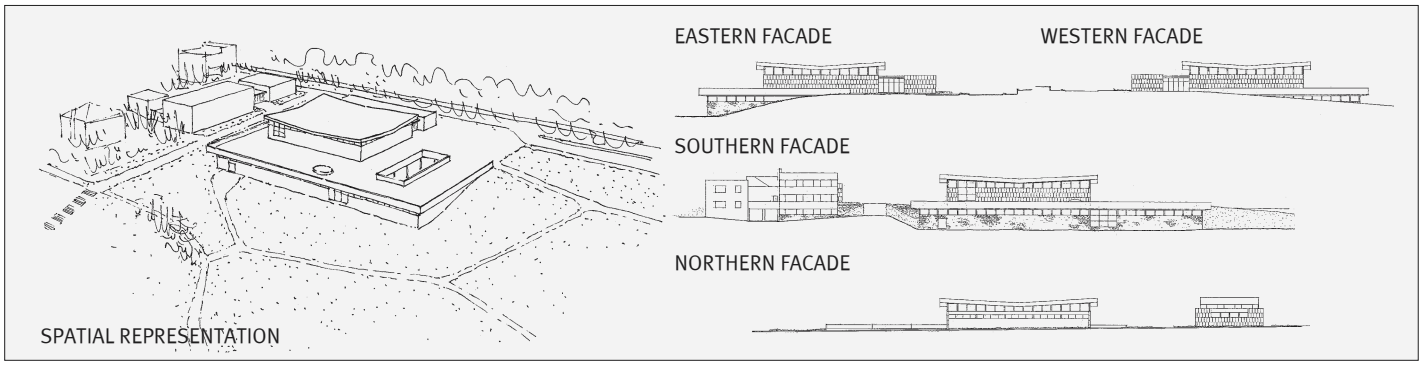
Transport and Business Facility on the East Coast of the Port of Split (1967)

Even today, the planning of the east coast of the Port of Split remains a pressing issue, with several urban planning competitions held, none of which have been implemented. This spatially, functionally, and design-sensitive situation has never received an adequate urban-architectural response, and the fragmented planning of individual zones hinders the development of a comprehensive, high-quality solution. In 1967, Jerko Marasović created a program study for this area, addressing the challenge of connecting and coordinating the various transportation modes – rail, bus, sea, and stationary traffic – that converge in this space. In his vision, he proposed a multistorey car park to facilitate these interconnected transportation systems (Fig. 2). The solution is comprehensive, with the transportation facility designed in a pure modernist expression, incorporating all the necessary elements. The spatial concept is open, featuring two large voids or atriums that extend through the entire height of the building, thereby allowing for excellent visibility throughout the structure. A restaurant is planned for the rooftop, offering an extraordinary view of the entire Port of Split. The façades are composed of glass, while the floors are accentuated by horizontal solid strokes at the levels of the floor and roof structures.

National Archaeological Museum and Institute in the Area of Zvonćac in Split (1960)

In 1960 Jerko Marasović created a proposal (Fig. 3) for the placement of the National

Fig. 3 National Archaeological Museum and Institute in Split from 1960, preliminary sketch



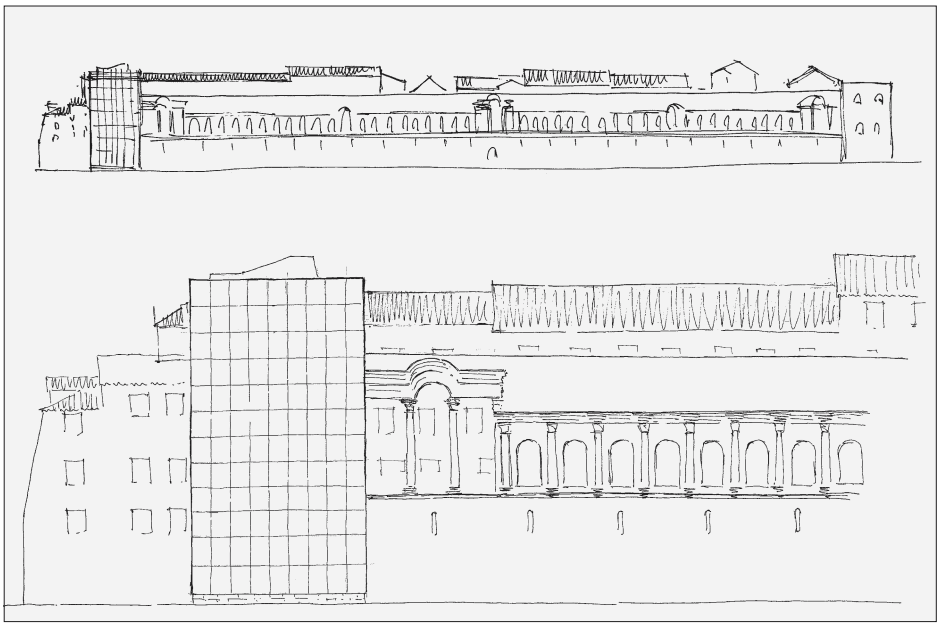


FIG. 4 SKETCH OF A VIEW OF THE TYPOLOGICAL RECONSTRUCTION OF THE SOUTH WESTERN TOWER OF DIOCLETIAN'S PALACE FROM 1958, DETAIL

Archaeological Museum and Institute in the Zvončac area of Split.

The design is marked by clear lines and an emphasis on horizontality, reflecting a careful consideration of the terrain's topography. From the sketch, it is evident that the architect envisioned a base constructed with rustically treated stone, while other parts of the façade are adorned with vertically arranged stone slabs, harmoniously integrated with horizontal glass strips and large rectangular surfaces in appropriate locations. Inside the building, an atrium lined with columns is positioned prominently. Marasović emphasizes the division between the ground floor and the first floor with pronounced horizontal lines, which are proportioned in a Renaissance manner relative to the scale of the building. The central cube, likely serving as the exhibition hall, is topped with an inverted hipped roof featuring a very slight slope. All these elements indicate a coherent modernist design for the building.

TYPOLOGICAL RECONSTRUCTION OF THE SOUTHWESTERN TOWER OF DIOCLETIAN'S PALACE (1958)

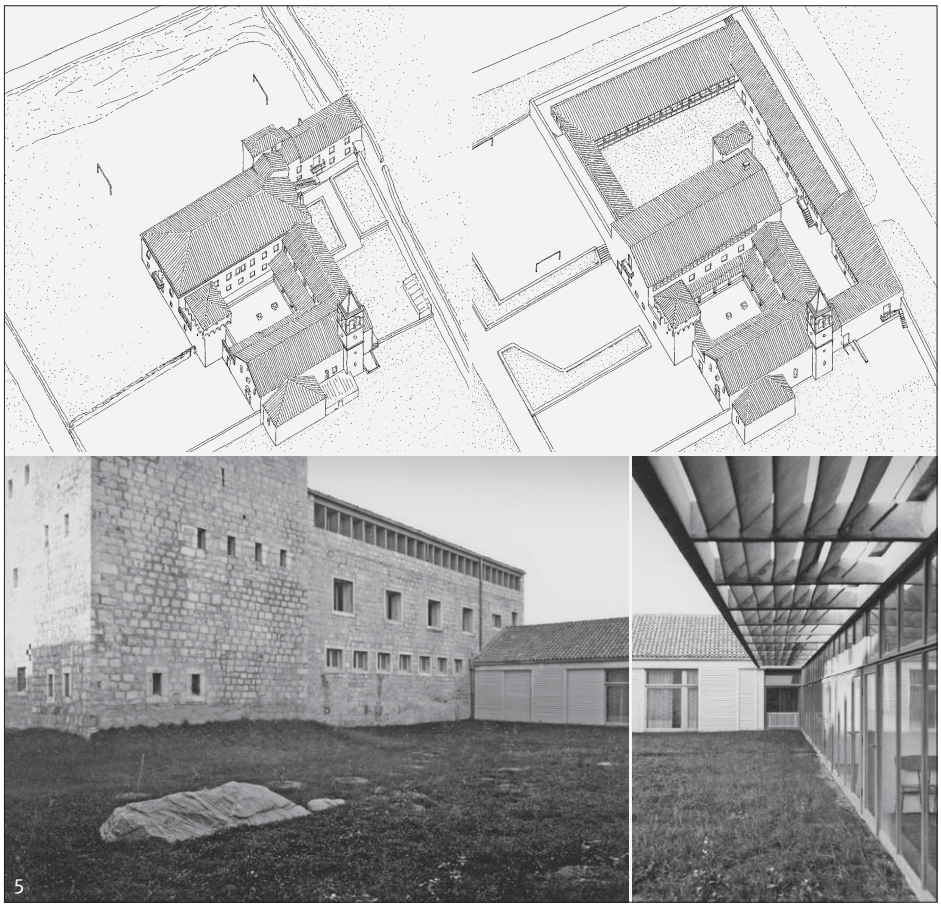
Particularly noteworthy is the sketch solution for the typological reconstruction of the southwestern tower of Diocletian's Palace, which the architect developed in 1958. This detail is part of a broader proposal for the arrangement of the southeast corner of the Palace. Based on the proposed design (Fig. 4), one gains insight into the architect's approach to designing in such a sensitive context – specifically, the replacement of the long-destroyed tower of Diocletian's Palace, located in the very heart of the City of Split.

Jerko Marasović boldly envisions a typological reconstruction in a completely modern manner; he captures the archetypal simplicity and monolithic volume of the former ancient defensive tower and interprets these qualities as a significant marker in space, defining a pure prism. Although the sketch does not specify the materials or colors, a rasterized façade featuring vertical panels is apparent. Even if stone were used, it would be presented in a modernist interpretation, serving merely as cladding – a surface – without the traditional stacking of stone in horizontal rows characteristic of historical construction methods. Despite the simplified spatial representation of the tower with a view of the southern city façade (within the context of Diocletian's Palace), the architect carefully addresses the necessary transition where the building meets the ground. With his *'croquis'* solution, he ensures that the design maintains a contemporary architectural sensibility.

RENOVATION OF THE MEDIEVAL MONASTERY IN POLJUD IN SPLIT WITH AN ADDITION OF THE SCHOOL (1965-1968)[1]

Jerko Marasović created a conceptual design for the renovation of the Franciscan monas-

1 Designer: Jerko Marasović; consultant: Neven Šegvić; associate: Davor Radovniković; Investor: Province of sv. Jerolima (*Eng. Saint Jerome*) Đ Zadar; Developer: Urbanistički biro – Split (*Eng. Urban Planning Office – Split*), Odjel za povijest graditeljstva (*Eng. Department of architectural history*).



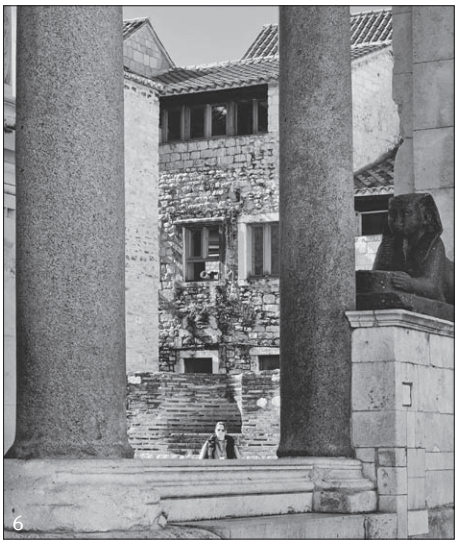


Fig. 5 Spatial representation of the condition before and after implemented work accompanied by design details of school spaces

Fig. 6 View of the 1957 upgraded and renovated northern facade of the former Urban Planning Institute of Dalmatia

tery complex in Poljud, with an addition of a school positioned north of the monastery complex. The oldest parts of the monastery complex date from the 15th century, and in the 19th and 20th centuries, upgrades were carried out but they damaged: '... *the value of the entire complex and they brought confusion in the stylistic authenticity of the original architecture'* (*** 1973a: 84).

The monastery complex needed renovation, as well as an upgrade with new spaces, including an addition of school facilities. Considering the value of the historical complex, the design included: '... *in addition to the reconstruction of the monastery, the integration of the newly built part of the school into the existing complex by its organic extension towards the north'* (*** 1973a: 84).

At the same time, the aforementioned inappropriate additions were removed from the monastery complex (Fig. 5).

The design of the added spaces of the school is simple and in the expression of a more emphasized modernist vocabulary – the school spaces are designed as single-story buildings covered with a single-pitched roof, oriented towards the courtyard and bordered by a fence wall, forming a space like a cloister. Such organization of space shows the author's reading of the typology of monastery architecture and its interpretation in contemporary expression.

The added sections to the renovated monastery buildings on the top floor are executed in a bold and contemporary manner, clearly indicating that they are new additions. This is exemplified by the use of window strips – a detail that the author frequently employed when working on extensions to existing historical architecture, similar to his renovations of buildings within Diocletian's Palace for the former Urban Planning Institute of Dalmatia (Fig. 6).

The façades of the school tracts are fully opened with glass walls, and protection from sunlight is addressed through the use of brise-soleils and sliding blinds (Fig. 5).

This architectural approach effectively realizes the programmatic requirements for modern, well-equipped living, working, and auxiliary spaces for monks and boarding schools (*** 1973a: 84).

ON THE ESSENCE AND TODAY'S RELEVANCE OF CRITICAL REGIONALISM

The focus of this paper is to assess Jerko Marasović's work within the framework of Critical Regionalism. To achieve this, the paper offers a review of the fundamental principles and evolution of this architectural approach. It aims to explain and contextualize Marasović's works through this theoretical lens, as well as within the relevant cultural and temporal contexts. Critical Regionalism was covered and popularized by Kenneth Frampton in his essays (Frampton, 1983a, 1983b) and he added it as a separate chapter in the revised and expanded edition of the book Modern Architecture: a Critical History (Frampton, 1985: 313-319). The essence of the view of what Critical Regionalism is, can be perfectly summed up by the following quote: *'After all, Frampton defines Critical Regionalism as a design position that mediates between local and global developments, but also as an approach that carries a certain resistance without being regressive.'* (Avermaete et al, 2019: 2). Therefore, it is clear that it is not about a design approach (basically) but about a reaction to the globalized world and architecture, including negative aspects of uncritical use of postmodern historical forms. As stated by Eggener (Eggener, 2002: 228) *'If critical regionalism was found difficult to define much beyond this and to be lacking in stylistic unity, this was because it was method or process rather than a product, and the process varied widely according to individual situations.'* However, simultaneously to the emergence of this theory, the society began to change rapidly on the global level, the use of computers became available to the general population, which would drastically change the civilization. The period from the early 1980s to the late 2000s *'was at the root of the transformation of "serious" and "necessary" architecture of the 1970s into star architecture'* (Koolhas et al., 2014: 84). The last decade has brought an incredible information technology development, and consequently an even more pronounced globalization; but also the automation of human work with a consequent loss of many jobs in certain professions; changes in geopolitical forces, economies, markets and production; the expansion of tourism with its, often disastrous, impact on local environments; large migrations of the population from regions affected by difficult political circumstances, as well as climate changes – all these are elements that arouse a certain doubt and even resistance to the concept of 'progress'. In the context of such circumstances, architecture faces not only the speed of changes that encompass all aspects of life, but also general globalization and especially climate changes.

Of course, the question arises in regards to the relevance of Critical Regionalism today. Alexander Tzonis, along with Liane Lefaivre the author of its name, changed it to Critical Re(gion)alism already in 1990 at the seminar 'Context and Modernity. The Delft International Working Seminar on Critical Regionalism', was held at the Faculty of Architecture of Delft University of Technology (Mota, 2018: 47). On the same occasion, Hans van Dijk stated that 'too many negative and incorrect meanings have become attached to this pair of notions for it to serve as a trustworthy vehicle for an idea anymore, let alone an attitude, code of ethics or a source of hope' and expectation'.

Awareness of the need to preserve unbuilt space, but also natural resources, non-renewable energy sources, the reduction of greenhouse gas emissions and waste (in which the construction sector has a large share), and thus the need to recycle the existing architecture – requires a more rational approach to construction and an active architectural contribution to sustainability. The search for the principles of sustainable construction inevitably leads to the research of historical architecture. Primarily, vernacular architecture has always emerged as a response deeply influenced by local conditions. Constructed with materials readily available on-site, it is fully adapted to the topography and geography of its environment. This type of architecture is rational and resource-efficient, making it a steward of soil and natural resources. Thus, it can be defined as *'macrobiotic'* architecture.

The emergence of Critical Regionalism in the 1980s was prompted by the need to question and redefine globalized (modernist) architecture, focusing on smaller environments that valorized their local social and cultural values through architecture. Today, its evolution can be primarily associated with seeking solutions within the framework of sustainability. Lefaivre and Tzonis share this perspective. In this context, and while respecting local specificities at all levels – from construction and design techniques to social and cultural

2 Unfortunately, it is only a few designs, as expected, since his lifelong work was dedicated to architectural heritage, so the largest number of his design accomplishments are related to works on restoration of historical architecture.

3 Designers: Jerko Marasović, Petar Galić; statičar: Boris Krstulović; associates: Mira Markotić, Gordana Šimat (Beg); Investor: Zajednica za financiranje osnovnog obrazovanja (*Eng. Community for the funding*

Fig. 7 View from the Fortress towards the school (on the left) and view of the built school with the Kliss fortress in the background (on the right)

implications – all interconnected through the concept of sustainability, Critical Regionalism remains relevant as a "method or process". It continues to be an architectural approach that honors local particularities, while now also contributing to sustainability, thus enhancing its global significance. It could be said that this architectural approach, which originally emerged as a form of resistance to globalization, has evolved into a methodology that promotes global improvement.

Designs in the Spirit of Critical Regionalism

The method itself is what defines the design process of Jerko Marasović. His most significant architectural achievement – the primary school in Klis – originates from the 1970s, a time before the theory of Critical Regionalism was even articulated, yet it can still be classified within that architectural direction. It is important to emphasize that Jerko Marasović did not arrive at this architectural style by applying new architectural theories, nor does he originate from post-colonial contexts where the Critical Regionalism approach was often imposed from outside (Eggener, 2002: 228). Instead, his architecture developed on the periphery of the architectural avant-garde movements of the time, situated within a distinctly different political, social, and economic context than that which was pivotal for the development of the theory. Marasović's work emerges purely as a result of his own knowledge. As a researcher of architectural heritage and a scholar, he possesses an exceptional understanding of the architecture of the Dalmatian area, including its construction logic and evolution. He is adept at assessing its values and layers and truly comprehends the local architectural language. From these insights, he approaches design and produces high-quality architecture.[2]

Kajo Gizdić (today's Petar Kružić) Primary School in Klis (1971-1972)[3]

The preliminary design of the primary school in Klis, near Split, was created in 1970, signed by Jerko Marasović as a designer and Pero Galić as an associate. The location was set in a complex context of outstanding natural features and cultural values – a terraced, concave slope, positioned west of the extremely significant historical architecture of the Klis fortress.[4] The rest of the surrounding construction was of a modest character (Fig. 7). In the technical description of the preliminary design, the authors use the simplest vocabulary to describe the concept:

> *'In accordance with the terrain configuration, the building rises in steps. The outline of the building follows the arc of isohypses, thus assimilating best into the natural environment. By adapting the building to the existing houses and terrain, the exterior walls will be finished in accordance with the finishing model of other walls of the existing buildings in Klis. The roofing will be made of roof tiles.'*

What can be distinguished from text is the designing method as well as selected designing elements – authors 'read' the context – of the natural terrain features, but also of the surrounding construction; they recognize and valorise the existing architectural vocabulary and draw their design accordingly. They start exclusively from the analysis of the local situation and define design parameters based

of basic education), Split; Developer: Urbanistički zavod Dalmacije (*Eng. Urban Institute of Dalmatia*), Odjel za graditeljsko naslijeđe (*Eng. Department of Architectural Heritage*).

4 Since the construction of the school, the spatial situation has changed, and this paper presents photographs from that period to accurately visualise the peculiarities of the location, which were the key starting point for the design concept itself.

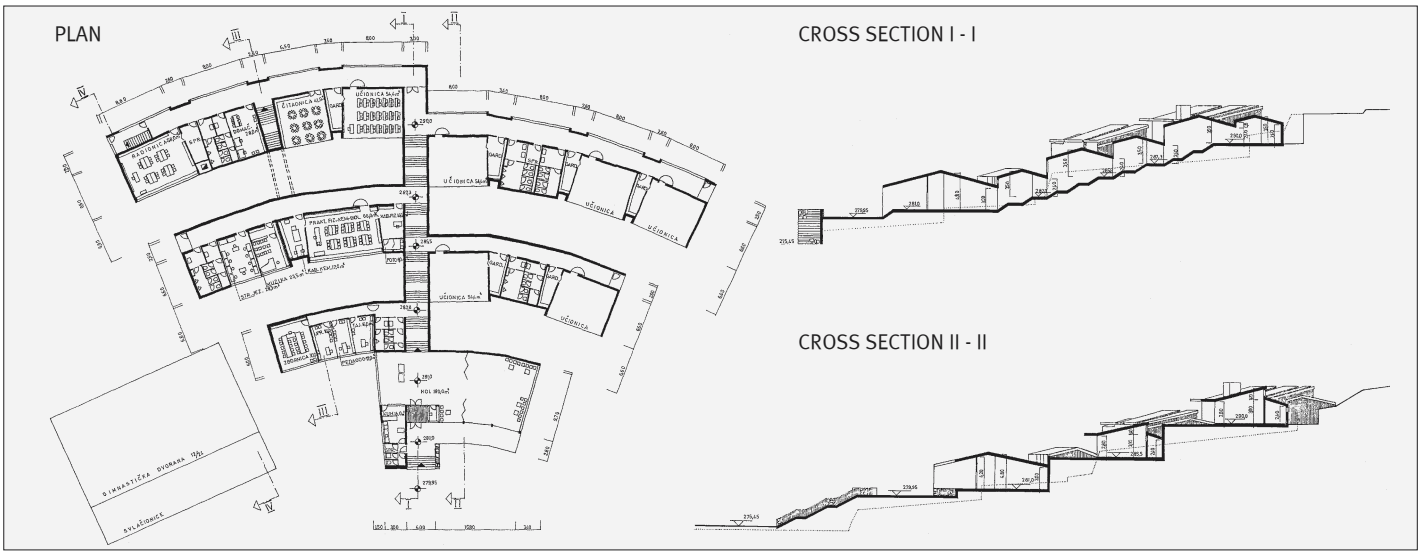


FIG. 8 PLAN AND SECTIONS I-I AND II-II THROUGH THE SCHOOL COMPLEX

on its foundations.[5] The logic of the concept seems self-evident, and the design and layout of the assembly looks as a part of the topography of the terrain itself. The floor plan layout (Fig. 8) of the school's fan-shaped contents logically not only follows but also rests on the natural shape of the terrain, while at the same time defining it.

Rows of classrooms are placed alternately east and west of the centrally placed communication 'spine'. In this way, the volume of the whole complex is divided into smaller parts, and the larger volumes of the school contents are adapted to the smaller scale of the surrounding residential architecture. The sections clearly show the fusion of the building with the terrain (Fig. 8). A particular contribution can be seen in the design of the roof surfaces (Fig. 1), which with their inclination follow the incline of the slope, and additionally 'shred' the volume of the school – the higher, single-pitched roofs of the classroom units penetrate through the lower, double-pitched roof surfaces that cover communications and spaces between the classrooms. At the same time, a vertical surface is created, shaped like a strip of clerestory windows (author's characteristic element), letting light through.

This building won the 'Borba' award for the best architectural achievement in Croatia in 1977.

The text of the jury's award explanation (Šegvić, 1978: 101) precisely valorises the features of this design:

> *'On the historical site of Klis, under the Klis fortress, the authors realized a design considering a range of factors; from purely utilitarian functional ones to highly cultural ones. The authors managed to bring the space of an eight-year school into the agglomeration, without damaging its outline or its structure, and by adding new segments, and emphasizing it with the object's content, not its forms. The school in its core is treated as a life and culture related environment of everyday life.*
>
> *In addition, the authors, using the method of architectural participation, opened a possibility of further upgrading and free development of the environment by determining its general outlines. They assumed the emphasis of personal architectural culture or temperament to be the social devel-*

5 *'Architects simply relied on themselves, trying to create architecture according to the task, not architecture according to this or that architecture. They were clearly not interested in any 'Tyrolean' stylizations of Dalmatian architecture, but did what they thought needed to be done.'* (Šegvic, 1978: 103)

6 *'The bulldozing of an irregular topography into a flat site is clearly a technocratic gesture which aspires to a condition of absolute* placeleness*, whereas the terracing of the same site to receive the stepped form of a building is an engagement in the act of 'cultivating' the site.'* (Frampton, 1983b: 26)

7 Frampton summarizes them in seven points – criticism of modernism and preference for a 'small' rather than a 'large' scale; architecture that consciously defines its own boundaries, and places the focus on the terrain it defines; which is 'tectonic' and not 'scenographic'; which takes into account all the specifics of the location; which is aware of the meaning of all sensory perception of space, and not just sight; critical of the sentimental application of vernacular elements, but will occasionally reinterpret them while remaining open to external influences; it flourishes in marginalized communities that manage to resist the pressure of globalization (Frampton, 1985: 327).

8 Designers: Jerko Marasovic as head designer and co-designers: Mira Markotić, Slaven Rožić and Petar

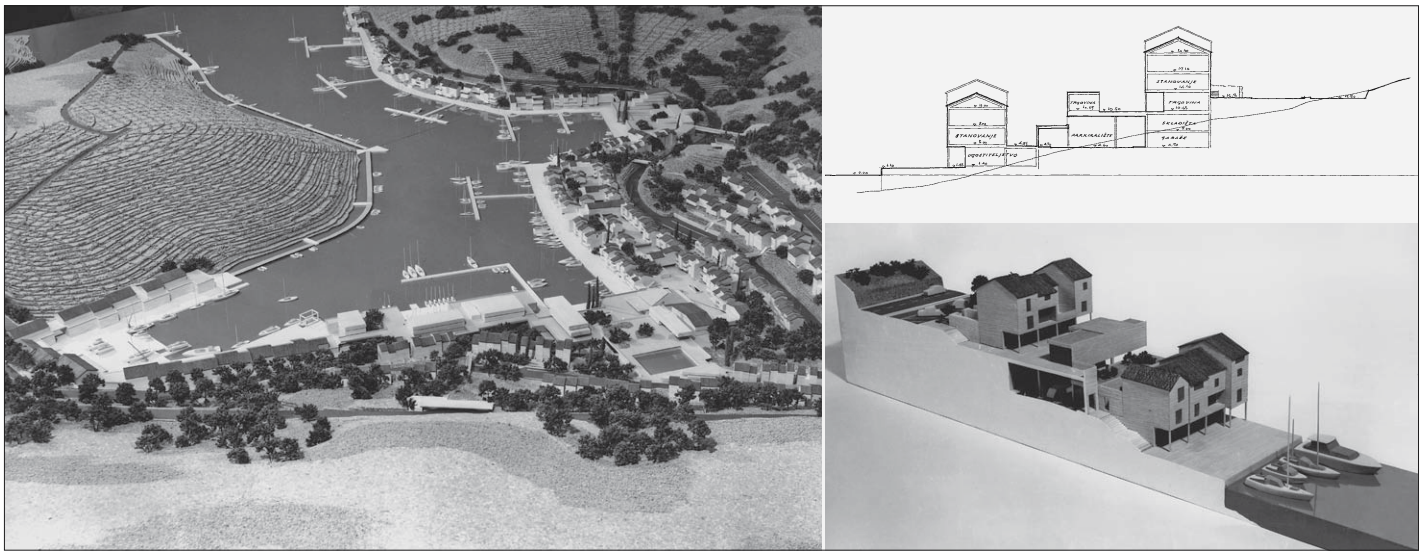


Fig. 9 Models of the marina Kremik complex and of the details, accompanied by the urban planning cross section

opment in the broadest sense of the word of such a small suburban agglomeration. With a modest choice of local materials, expressive means and details, they showed an unpretentiousness that surely represents one of the paths of contemporary architecture. This is exactly where we saw a contemporary tendency of the democracy of architecture.'

From the above, it can be concluded that the concept arose from a deep understanding of the context and respect for its 'limitations' and peculiarities, unencumbered by trends. An extremely careful attitude towards topography[6] is noticeable, which is one of the key topics of Critical Regionalism, and the aforementioned explanation of the jury clearly emphasizes the local conditioning of the design and its socio-cultural meaning and contribution. These are all elements that the school's architecture shares with the features of Critical Regionalism.[7]

Kremik Marina near Primošten (1972)[8]

The 1970s were a time of significant development of tourism on the east coast of the Adriatic. The authors of the urban planning design of the marina recognized the potential dangers for space and quality of life brought by the seasonality of tourism. They proposed a solution that ensured year-round use of the space, and thus quality coexistence between tourism and the local community.[9] The architecture follows the topography of the terrain, and special attention is paid to an attractive view to the opposite vineyard (Fig. 9). The concept is thoughtful and innovative – a distinct value is provided by the complete separation of the pedestrian zone and traffic road; the entertainment life is connected to the coastal part, and shopping facilities in the shopping street to the parking lot; all ground floors of tourist and residential houses are intended for public purposes (*** 1973b: 38). The typology of the marina's residential contents foresees smaller volumes that reinterpret local traditional architecture with a contemporary expression, and do not fall under the "populism"[10] of designs like the French marina Port Grimaud.[11] Accompanying contents of a larger size are placed in modernistically designed volumes. Unfortunately, only the nautical part of the content was realized and this interesting concept never had an opportunity be verified through its usage.

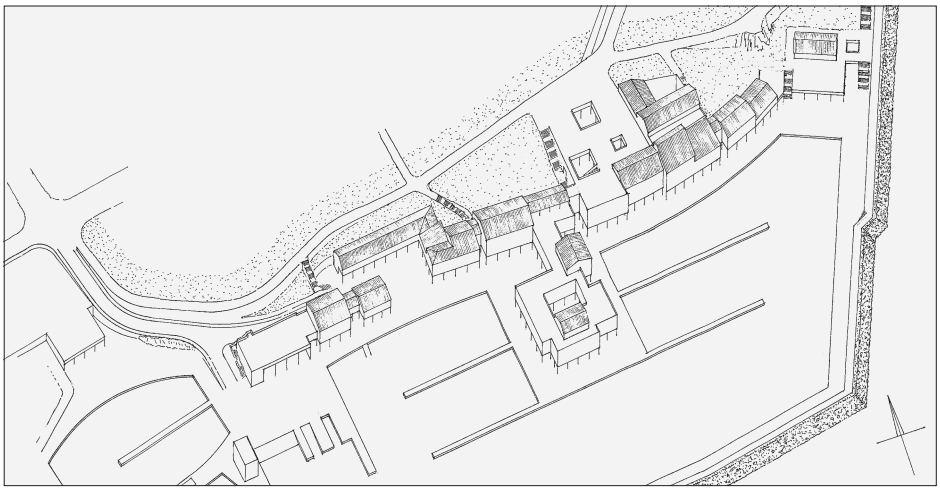
Galić; designs of maritime works and roads design institute "Obala" from Split.

9 A unique complex of a residential marina was planned to include: 750 moorings as well as accommodation capacity on dry land for 400 vessels, tourist accommodation with 300 commercial apartments and 200 hotel beds and a village with 200 apartments, with all the necessary accompanying facilities for all the above purposes (*** 1973b: 38).

10 *'It is necessary to distinguish at the outset between critical regionalism and the simplistic evocation of a sentimental or ironic vernacular. I am referring, of course, to the nostalgia for vernacular which is currently being conceived as an overdue return to the ethos of a popular culture; for unless such a distinction is made one will end by confusing the resistant capacity of Regionalism with the demagogic tendencies of Populism.'* (Frampton, 1983a: 149)

11 The picturesqueness of the Port Grimaud residential marina, built according to the design of François Spoerry, was gladly accepted, but essentially it was architecture as scenography: *'Some would criticize this style of architecture and this development as pastiche or simply as a stage-set around which the everyday activities of boating take place.'* (Oldham, 1993: 185). Everything is exclusively subordinated to tourist content, and the design arbitrarily combines elements of the traditional architecture of Provence, as well as of Greek islands, Italy, Spain...

FIG. 10 SPATIAL REPRESENTATION OF THE PROGRAMME SKETCH AND OF THE ZENTA MARINA



ZENTA MARINA IN SPLIT (1978)[12]

The programme sketch envisages a residential marina, smaller in scale than the Kremik[13] marina. Judging by the attached spatial representation (Fig. 10), it can be concluded that the starting points related to the arrangement of contents and designs were similar – public contents are located on the ground floors, which are divided by porches; promenades and multi-level 'squares' attached to them; residential facilities are placed in smaller volumes designed somewhat in the light of Critical Regionalism and are organically interwoven with larger volumes of accompanying facilities of modernist design.

Both marina designs show the author's responsibility towards the space, but also towards the local community. They aimed at mitigating the negative impacts of unplanned or uncontrolled tourism on both society and the environment. Their design approach is careful and respectful of the natural context, characteristics that align them with the principles of Critical Regionalism.

CONCLUSION

> *L'architecture est un mélange de nostalgie et d'anticipation extrême.* (*Eng. Architecture is a mixture of nostalgia and extreme anticipation*) – Jean Baudrillard, on the door of a restored church in Sarlat by Jean Nouvel

By studying designs of Jerko Marasovic's new construction, their architectural and social value is discussed, both at the time of their creation and today. This sheds new light on the life's work of this outstanding expert in the field of research, restoration, preservation and presentation of architectural heritage, as his work is perceived exclusively in that context. His earlier works belong to the modernist expression. In his later ones, recognized peculiarities classify them in the direction of Critical Regionalism, which is argued by looking at the essence of the direction, and also at its current position and relevance.

It can be concluded that Jerko Marasović's architectural designs align with the definition proposed by Baudrillard.

[Translated by Ivana Bavćevic, univ. mag. edu. philol. angl. et philol. ital.]

12 Designer: Jerko Marasović; maritime solution – designers: Nenad Marasović, Bruno Donati; associates: Vladimir Marćić, Daša Vuletić; Developer: Urbanistički zavod Dalmacije (*Eng. Dalmatian department of urban planning*), Odjel za graditeljsko naslijeđe (*Eng. Department of architectural heritage*)

13 Since the location is positioned in the City of Split, there was no need to provide designs for residential areas as in the case of the Kremik marina.

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Illustration sources

Figs. 1-5, 7, 8, 10	URBS Archives (former 'Urbanistički zavod Dalmacije' / Urban Planning Institute of Dalmatia in Split)
Fig. 6	Author, 2024
Fig. 9	*** 1973b: 38 (models), URBS Archives (cross section)

Author's biography

Snježana Perojević, Ph.D., is the head of the Department of Theory and History of Architecture and Art and teaches courses in the fields of history of architecture and urbanism, as well as architectural heritage. She carries out scientific and professional research in the field of architectural heritage, including the issue of contemporary interventions in the context, the impact of tourism on historical urban environments, and the relationship between the topic of sustainability and architectural heritage.

ONLINE SURVEY QUESTIONNAIRE

Dear Sir or Madam,
Please find the survey questionnaire that examining working conditions during the Covid-19 pandemic, from March 2020 up to October 2020. The survey is conducted exclusively in the purposes of a scientific research at the Faculty of Architecture, University of Montenegro. This questionnaire includes only employed respondents from Podgorica. If you are not employed in Podgorica, please do not continue with the survey.
It is needed up to 5 minutes to complete the survey. It will be active until October 12, 2020.
Thank you for your participation and contribution to the scientific work!

I GENERAL INFORMATION

E-mail: _____
Year of Birth: _____
Gender: male / female / other
Place of employment: _____
Employment Status:
- ☐ Internship
- ☐ Employer / owner of the company
- ☐ Employed in the private sector
- ☐ Employed in the public sector

Education Degree:
- ☐ Primary school
- ☐ High School
- ☐ University degree or higher

Marital status:
- ☐ Not married
- ☐ Married
- ☐ Divorced
- ☐ In a cohabitation
- ☐ Widowed
- ☐ Other

The ages of your children:

Preschool	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 4+
Primary school	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 4+
High School	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 4+
College / 18+ years	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 4+
I have no kids	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 4+

I live in:
- ☐ In rented apartment / house
- ☐ An apartment that is owned by me / owned by my family
- ☐ A house that is owned by me / owned by my family
- ☐ Other

II ORGANIZATION OF WORK SPACE IN OFFICES DURING THE PANDEMIC

1. How many employees do you share the work space with?
   - ☐ I don't share a workspace
   - ☐ 1-3 persons
   - ☐ 3-5 persons
   - ☐ 5-10 persons
   - ☐ more than 10 persons
2. The size in sq. m of your work space?
   - ☐ 5-10 m²
   - ☐ 10-20 m²
   - ☐ 20-40 m²
   - ☐ more than 40 m²
3. Rate the degree of satisfaction with the workspace / office? (1 – very dissatisfied, 5 – very satisfied)

Functionality	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Noise level	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Daylighting level	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Level of artificial lighting	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Office ventilation	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

4. Air-condition of your workspace?
   - ☐ Single air conditioning units
   - ☐ Multi split system / central air conditioning
   - ☐ Recuperators / heat pumps
   - ☐ Radiators
   - ☐ Other
5. How is your workspace ventilated?
   - ☐ Natural ventilation / windows
   - ☐ Artificial ventilation / duct system
6. Did you have provided physical barrier between the workplaces in your office during the period of COVID-19
   - ☐ Yes
   - ☐ No
   - ☐ Partially
7. Is your workspace adapted for working conditions during the COVID-19 pandemic?
   Please describe _____

III WORKING LOCATION DURING COVID-19 PANDEMIC

1. How did you perform your work during the pandemic?
   - ☐ Physically in the office
   - ☐ Online
   - ☐ Combined
2. If you were in isolation due to the Covid-19 pandemic, did you work from home (online)?
   - ☐ Yes
   - ☐ No
3. Has your income changed during the Covid-19 pandemic?
   - ☐ has been reduced
   - ☐ has been increased
   - ☐ remained unchanged
4. For how long have you worked from home (period of time)?
   - ☐ Up to 1 month
   - ☐ 2-3 months
   - ☐ 3-6 months
   - ☐ 6-12 months
   - ☐ I didn't work from home
   - ☐ All the time

IV ORGANIZATION OF WORK FROM HOME

1. Have you been forced to work from home during the COVID-19 pandemic?
   - ☐ Yes
   - ☐ No
   - ☐ It was up to me / my choice
2. The structure of your living space:
   - ☐ studio apartment
   - ☐ one bedroom apartment
   - ☐ two bedrooms apartment
   - ☐ three bedrooms apartment
   - ☐ other
3. How many members of your family did some activity from home, including you (give a numerical value)?

Work from home	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 0
Online classes	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 0

4. Did you share your work space with other housemates during the working hours?
   - ☐ Yes
   - ☐ No
5. In which part of the living space did you work most often (living room, study, dining room...?)
   - ☐ living room
   - ☐ working room
   - ☐ bedroom
   - ☐ dining room
   - ☐ terrace / balcony
   - ☐ I didn't work from home
6. Did you have to adapt your living space to the needs of working from home?
   - ☐ Yes
   - ☐ It wasn't necessary
7. Did you use the state-provided right not to work as a parent of a child under the age of 11?
   - ☐ Yes
   - ☐ No
   - ☐ I don't have kids / I don't have kids of that age
8. Did you share time and space with kids during working hours?
   - ☐ Yes
   - ☐ No
   - ☐ I don't live with kids
9. Did you have to dedicate a part of your working time to helping children to learn during online classes?
   - ☐ Yes
   - ☐ No
   - ☐ I don't live with kids
10. Heating and cooling system of your living space:
    - ☐ Individual air conditioning units
    - ☐ Multi split system / central air conditioning
    - ☐ Pellets, wood and fuel oil
    - ☐ Radiators
    - ☐ Other
11. Rate the degree of satisfaction with the space you work from home? (1 – very dissatisfied, 5 – very satisfied)

Functionality	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Noise level	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Daylighting level	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Level of artificial lighting	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Internet connection stability	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Psychological impact	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

12. How did working from home affect the quality of work? (1 – very dissatisfied, 5 – very satisfied)
    ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
13. Was your living space sufficient to meet your work-from-home needs?
    - ☐ Yes
    - ☐ No
14. How did working from home affect the electricity consumption in your home?
    - ☐ The bills have increased
    - ☐ Bills have decreased
    - ☐ It didn't affect
15. If you had the opportunity to choose your own way of working DURING the COVID-19 pandemic, what would you choose:
    - ☐ Physically in the office
    - ☐ Online
    - ☐ Combined
16. If you had the opportunity to choose your own way of working AFTER the COVID-19 pandemic, what would you choose:
    - ☐ Physically in the office
    - ☐ Online
    - ☐ Combined

* Thank you for your time and modest contribution to the scientific research work!!!

Sanja Paunović Žarić[1], Svetlana K. Perović[2], Ema Alihodžić Jašarović[3]

[1,2,3] University of Montenegro, Faculty of Architecture, Džordža Vašingtona bb, 81000 Podgorica, Montenegro

[1] https://orcid.org/0000-0001-7925-4262

[2] https://orcid.org/0000-0002-9328-9661

[3] https://orcid.org/0000-0002-7559-4005

sanja.paunovic@ucg.ac.me
svetlana.perovic@ucg.ac.me
aema@ucg.ac.me

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Towards a Model of Resilient, Sustainable and Productive Post-Covid Work Environment

Hybrid Solution for Podgorica, Montenegro

HYBRID WORK SOLUTIONS
POST-PANDEMIC OFFICE
RESILIENT OFFICE
SUSTAINABLE OFFICE
WORK FROM HOME

The Covid-19 pandemic has significantly changed the work perception and attitudes of employees. The goal of this research is to identify the experience of the beneficiaries and provide guidelines to develop an optimal model of the working environment during and in the post-pandemic period. The study is focused on an anonymous survey comprising 34 combined questions conducted online among 202 responders, including general questions, the issue of working conditions in offices, manner of transforming working conditions during the pandemic and personal perception of comfort. The questionnaire is also related to transitive solutions, work from home and the accentuation of a favourite manner of work upon the end of the pandemic. The results of the questionnaire together with theoretical analyses of this research may be useful for creating a good basis for the definition of optimal work spaces in the post-pandemic period, in order to further direct the development of resilient work spaces on the territory of Podgorica, as a case study. The study may be also applied to other contexts.

Introduction

Decades ago, the office was transformed into a separate entity denoting spatial, physical and constructed environment in which people perform business activities (Dale, Burrell, 2007). With the creation of portable devices, office becomes virtual and changeable. Employers have been facing new challenges in the creation of simulative and productive working environment (Ross, 2012). The emphasis is also on extensive use of technology and certification of buildings by adoption of sustainability norms, as well as structural changes in the work organization (Gupta, Bajaj, 2023). The reengineering which entailed smart usage of information technologies, predominantly virtual organizations, has resulted in a range of alternative solutions ranging from tele-cottages up to alternative locations such as cafés (Van den Dobbelsteen, 2004). Ross (2022) developed a theory that "*Your Office Is Where You Are*", so no one has a fixed work position.

Geneses of work spaces evolved from "*cellular offices*" (Fig. 1a), offices grouped around central atrium or corridor (Jeska, 2002), to "*open plan offices*" (Fig. 1b) formed as spaces which negate prescribed conditions for lighting, aeration and thermal characteristics of a space. Combined systems (Fig. 1c) of cellular and open plan offices, lead to "*collaborative spaces*" which may ensure individuals the opportunity to choose not only the place of work and performance of tasks, but also the conditions and direct interior and exterior environment.

Nowaday, administrative buildings are reinforced by innovative spaces such as gardens, playrooms, cafeterias and recreation spaces. Borders such as public/private, home/work, work/recreation are being denied (O'Neill, 2014) by placing the emphasis on the possibility for interaction and transformability. In his contingency theory Joan Woodward (Zeller, 2020) introduces a simple principle of dichotomy of non-routine and routine for the identification of changes in the process, control and productivity. Tasks performance in the office can be related to the routine, while work from home is related to uncertainty.

The establishment of a relationship between hybrid virtual and traditional work environment is of paramount importance. All this requires a redefinition of recent organizational formats in which virtual manner of work should be set up as the assistance to the employees, with the traditional one as the basis; hierarchical formats are being replaced by horizontal structures (Zeller, 2020) in order to define roles, powers and responsibilities. The manner of measuring the progress in the performance of working assignment also has to be changed and the success has to be recognized and revisable (Zeller, 2017), although remote work has become a "*new normal*".

The Covid-19 pandemic has accelerated the process of transformation of the business environment, from physical, hybrid to virtual in different segments: workload distribution, the control and management of business process. In terms of competitiveness, the researches indicate that the survival of physical space entails its transformation from functional aspect – the size of the premise, shape of the work station, as well as comfort parameters. Design authenticity is moved from the focus for the benefit of the creativity of employees to create new offices. The new normal work environment was an opportunity to become a model that provides employees with flexibility and support, more autonomy and higher engagement (Nagy, Adnan, 2022). The recovery from the pandemic affected resilience and increased awareness of user comfort, as well as the increased role and use of energy-saving technologies and energy efficiency (Amir, Khan, 2022; Echegaray, 2021). However, to the best of our knowledge previous works related to the post-pandemic organization of work spaces did not consider the exact employees' perception of work spaces, comfort and habits during and after the pandemic. Thus, one of the main goals of this research was to create a questionnaire to address a realistic perception of different working conditions. In order to

Fig. 1 The genesis of workspaces
a) traditional system, b) open-plan system, c) combined system

achieve the stated goal, the questionnaire has been created and conducted through survey, among employees in the administrative sector. The questionnaire is created in a way to provide responses on organization of work space in offices during the pandemic, working location, work from home and preferable workspace after the Covid-19 pandemic. The results of the questionnaire together with the theoretical analyses from this research may support the creation of a solid ground for determining optimal workspaces in the post-pandemic period. This is key for directing further developments of workspaces on the territory of Podgorica, while the conclusions of the research may be also applied to other contexts. The aim of the research was also a comparative analysis of architectural solutions and comfort in the office as opposed to at home in order to provide new schematic office proposals in terms of comfort and energy use. The results have also led to the hybrid model as an optimal solution in the post-Covid era.

Materials and methods

The Context of the Research

Montenegro was the country with a record number of infected people in Europe, with regard to the number of citizens. This is considered relevant for the case study within this research. Federation of Employers of Montenegro (2021) in its questionnaire problematizes remote work that was mainly conducted during the lockdown period. Around 40% of the surveyed enterprises continued to apply remote work in the last quarter of 2020, while during the lockdown period, 60% of enterprises implemented remote work. More than a half of companies which had remote work faced the fall of productivity, out of which almost 60% considered such fall important or very important.

Upon the end of the pandemic, the majority of the sector would have rather returned the employees to the premises of the company. The sector of information, communications and design prefer the preservation or improvement of flexible work practices, while more than a half of enterprises expressed their intention to do so (Monstat, 2020). One fourth of the enterprises need guidelines on how to ensure the wellbeing of the employees and how to support them to achieve the balance between business and private life more easily. This analysis predominantly covers the private sector, small and medium-sized enterprises. There is a lack of analyses regarding the administration sector.

In addition to this, Podgorica as the capital city of Montenegro and leading administrative centre of the state, with the greatest percentage of business operations, administrative and public buildings, in 2020 had 13419 business buildings which represents 36.2% of the total number of business buildings in Montenegro (Monstat, 2021). This was an additional motivation to conduct research among employees in the administrative sector in Podgorica, capital of Montenegro.

Online Questionnaire and Statistical Analysis

The leading research method in this paper is the questionnaire, as a verified methodological procedure of the collection of data. Attitudes and opinions of work space users on the topic of individual perception of work under the Covid-19 conditions have been investigated. This method is obligatory when it comes to personal perception and comparative analysis of the work during pandemic. The survey is conceived as a written anonymous questionnaire composed of 34 combined questions (see *Survey questionnaire*) related to general questions, the issue of working conditions in offices, the manner of transformation of working conditions during the pandemic and personal perception of comfort conditions of working in the office or from home. Based on specific socio-cultural determinants, it has been noted that although the survey has been conducted in Podgorica, it can be applied as of universal relevance. The questionnaire was distributed by e-mail to 550 employees in the administration sector. Only 202 respondents answered the survey, i.e. 37% of the total contacted employees submitted the online questionnaire. The questionnaire was available on *Google drive* in the midst of the pandemic, from March 2020 up to October 2020. The first part of the questionnaire is related to general data such as: employment status, education degree, marital status, children's ages and the structure of the housing unit. The second part of the questionnaire was formed to provide responses on the organization of work space in offices during the pandemic, working location, work from home and preferable working environment after the pandemic. In addition, this part provides information about the structure of the space, an assessment of personal satisfaction with the space, economic and psychological impact on employees. The questionnaire entails contemporary questions requiring personal experiential attitude on the conditions of visual, thermal and acoustic comfort in the office and during work from home. The possibility of valuation on 1-5 scale (while 1 means that the responder is very disatisfied and 5 means that the responder is very satisfied) and interpretative questions which allow certain explanations in terms of the text have been used. Jointly with theoretical analyses, the results of the questionnaire from this research may support the creation of a solid ground for determining optimal work spaces in the post-pandemic period, which is key for directing further developments of work spaces, while the conclusions of the research may also be applied to other contexts.

The statistical data processing for the description of important parameters depending on their nature used the frequencies and percentage, sample average value with sample standard deviation. One-factor analysis of variance *(ANOVA)* was used for testing the differences between parameters, as well as Chi-square test with qualitative variables. Predictive features of independent variables were tested by univariant and multivariant binary logistic regression. The criterion variable was coded as k/+ variable (preference of office work = 0, preference of combined work = 1). Statistical processing and analysis were done in statistical package SPSS version 24 (*Statistical Package for the Social Sciences*) for Windows. The level of probability was defined at $p \leq 0.05$.

Results

General Data

The 54% of respondents were female. Age ranged from 22 to 57 years, with average age of 35.97±7.25 years. The majority of respondents had university degree (93.6%). There were 63.8% respondents married. 55% of respondents had children, while the same percentage of responders lived in their own flat or the property of their family (Table I).

Organization of Workspace in Offices

Organization of workspace in offices during the Covid-19 pandemic is examined in this part (Table II). The aim of the survey was to obtain data among the employees in different sectors (employer/company owner, public and private sector employee) since there was a difference in the organization of workspace.

Almost half of the responders work in the space that they share with 1 to 3 persons – which corresponds to traditional office premises (47%). The largest percentage of employers (45.5%) and public sector employees (47.6%) work in the space with a surface between 10 and 20 m^2, while the largest percentage of the employees in the private

Table I Demographic characteristics of the survey sample.

	All [N=202] percentage (no. of respondents)	Employment Status percentage (no. of respondents)			p
		employer / company owner [N=22]	Employed in the public sector [N=82]	Employed in the private sector [N=98]	
Gender, n (%)					
Male	46% (93)	59.1% (13)	32.9% (27)	54.1% (53)	0.008[a]
Female	54% (109)	40.9% (9)	67.1% (55)	45.9% (45)	
Age	35.97±7.25 (22-57)	37.82±5.95	37.48±8.58	34.3±5.84	0.006[b]
Degree of education, n (%)					
Elementary school	0% (0)	0% (0)	0(0%)	0% (0)	0.300[a]
Secondary school	6.4% (13)	4.5% (1)	3.7% (3)	9.2% (9)	
Higher education or higher	93.6% 3(189)	95.5% (21)	96.3% (v)	90.8% (89)	
Marital status, n (%)					
Married	57.9% (117)	68.2% (15)	67.1% (55)	48% (47)	
In an extramarital relationship	5.9% (12)	4.5% (1)	4.9% (4)	7.1% (7)	
Widower	0% (0)	0% (0)	0% (0)	0% (0)	0.130[a]
Free	27.7% (56)	27.3% (6)	17.1% (14)	36.7% (36)	
Divorced	4.5% (9)	0% (0)	6.1% (5)	4.1% (4)	
Other	4% (8)	0% (0)	4.9% (4)	4.1% (4)	
Do you have children, n (%)					
No	45% (91)	36.4% (8)	37.8% (31)	53.1% (52)	0.084[a]
Yes	55% (111)	63.6% (14)	62.2% (51)	46.9% (46)	
Number of preschool children	1.44±0.55 (1-3)	1.44±0.55	1.46±0.61	1.44±0.5	0.751[b]
Number of primary school children	1.57±0.57 (1-3)	1.57±0.57	1.52±0,59	1.38±0.5	0.004[b]
Number of high school children	1.29±0.59 (1-3)	1.29±0.59	1.33±0,65	1.25±0.5	0.866[b]
Number of adult children	1.65±0.7 (1-3)	1.65±0.7	1.69±0,75	1.33±0.58	0.665[b]
Living in, n (%)					
A house owned by me / my family	24.8% (50)	22.7% (5)	25.6% (21)	24.5% (24)	
Apartment owned by me / my family	55% (111)	63.6% (14)	56.1% (46)	51(52%)	0.134[a]
Apartment / house I'm renting	15.8% (32)	13.6% (3)	9.8% (8)	21.4% (21)	
Other	4.5% (9)	0% (0)	8.5% (7)	2% (2)	

Numerical variables are shown through mean ± standard deviation (Minimum-Maximum). Chi-square test; bANOVA test.

1 Natural ventilation / windows were a more frequent manner of ventilation in workspaces of company owners (90.9%) and in the public sector (93.9%), than in the private sector (78.6%), which indicates a much better aeration of traditional offices than those above 40 m², p=0.010. With regard to compared groups, barriers were not ensured for 75.6% of respondents from the public sector and a lower percentage of other respondents (employers/company owners: 40.9%, private sector employees: 42.9%), p<0.001.

2 There is no agreement among the three groups about whether the space was adjusted for work under the pandemic conditions. In fact, 77.3% employers think that workspace was adjusted; this percentage is significantly lower if we take into account the responses of the public sector employees (34.1%), but also private sector employees (66.3%), p<0.001.

3 The respondents evaluated the level of satisfaction on the Likert scale by different characteristics of the workspace. They were most satisfied with the natural lighting of the workspace (3.67±1.32 (1-5)), then with aeration of the workspace (3.64±1.29 (1-5)), then artificial lighting of the workspace (3.61±1.21 (1-5)) and functionality of the workspace (3.47±1.26 (1-5)), while noise level in the workspace received the lowest grade (3.23±1.37 (1-5)).

sector (37.8%) work in the space of 40 m², p<0.001, which corresponds to the landscape office type.

The basic way of air conditioning the space is single air conditioning unit or multi split systems, while ventilation mostly relies on natural ventilation.[1] There is alarming data indicating that there was no physical distance within the workspace and that the spaces were not adjusted to the Covid-19 recommendations, i.e. 113 responders (55.9%), indicate potentially greater transmission, which led to the multiplication of the number of collective isolations and shift of work into homes. A total of 54.5% responders think that the space in which they work was in some way adjusted to the working conditions during the Covid-19 pandemic.[2] Distance keeping was the most frequent way of adjusting in workspaces under the pandemic conditions (35.6%). Employers were most satisfied with the daylight and natural ventilation of the working units[3],

Table II Organization of workspace in offices during the COVID-19 pandemic

	All [N=202] percentage (no. of respondents)	Employment Status percentage (no. of respondents)			P
		Employer / company owner [N=22]	Employed in the public sector [N=82]	Employed in the private sector [N=98]	
How many employees do you share public space with, n (%)					
0	6.9% (14)	9.1% (2)	7.3% (6)	6.1% (6)	0.882[a]
1-3 people	47% (95)	54.5% (12)	46.3% (38)	45.9% (45)	
3-5 people	19.8% (40)	13.6% (3)	15.9% (13)	24.5% (24)	
5-10 people	16.8% (34)	13.6% (3)	19.5% (16)	15.3% (15)	
more than 10 people	9.4% (19)	9.1% (2)	11% (9)	8.2% (8)	
Total area of the office, n (%)					
5-10 m²	17.8% (36)	4.5% (1)	29.3% (24)	11.2% (11)	‹0.001[a]
10-20 m²	36.1% (73)	45.5% (10)	47.6% (39)	24.5% (24)	
20-40 m²	21.8% (44)	13.6% (3)	18.3% (15)	26.5% (26)	
more than 40 m²	24.3% (49)	36.4% (8)	4.9% (4)	37.8% (37)	
Functionality of the workspace	3.47±1.26 (1-5)	3.82±1.05	2.88±1.3	3.88±1.08	‹0.001[b]
Noise level of the workspace	3.23±1.37 (1-5)	3.59±1.37	3±1.32	3.35±1.39	0.103[b]
Natural lighting of the workspace	3.67±1.32 (1-5)	4.09±1.15	3.2±1.4	3.98±1.16	‹0.001[b]
Artificial lighting of the workspace	3.61±1.21 (1-5)	3.73±1.2	3.23±1.2	3.91±1.15	0.001[b]
Ventilation of the workspace	3.64±1.29 (1-5)	4.14±1.04	3.29±1.33	3.82±1.25	0.004[b]
How is the workspace air conditioned, n (%)					
Single air conditioning units	52% (105)	81.8% (18)	65.9% (54)	33.7% (33)	‹0.001[a]
Multi-split system / central air conditioning	43.1% (87)	18.2% (4)	26.8% (22)	62.2% (61)	
Recuperators / heat pumps	2% (4)	0% (0)	1.2% (1)	3.1% (3)	
Radiators	3% (6)	0% (0)	6.1% (5)	1% (1)	
Other	0% (0)	0% (0)	0% (0)	0% (0)	
How is the ventilation of the workspace, n (%)					
Natural ventilation / windows	86.1% (174)	90.9% (20)	93.9% (77)	78.6% (77)	0.010[a]
Artificial ventilation / duct system	13.9% (28)	9.1% (2)	6.1% (5)	21.4% (21)	
Did you provide a physical barrier between workplaces in the COVID-19 period, n (%)					
Yes	21.3% (43)	31.8% (7)	9.8% (8)	28.6% (28)	‹0.001[a]
Partly	22.8% (46)	27.3% (6)	14.6% (12)	28.6% (28)	
No	55.9% (113)	40.9% (9)	75.6% (62)	42.9% (42)	
Is your workspace in some way adapted to the working conditions during the COVID-19 pandemic, n (%)					
Yes	54.5% (110)	77.3% (17)	34.1% (28)	66.3% (65)	‹0.001[a]
No	45.5% (92)	22.7% (5)	65.9% (54)	33.7% (33)	
How is the workspace adapted to the working conditions during the COVID-19 pandemic, n (%)					
Not adapted	45.5% (92)	22.7% (5)	65.9% (54)	33.7% (33)	0.001[a]
Distance more than 2 meters	35.6% (72)	50% (11)	22% (18)	43 (43.9%)	
Separate entrance	0.5% (1)	4.5% (1)	0% (0)	0% (0)	
Working in shifts	2.5% (5)	4.5% (1)	3.7% (3)	1% (1)	
Working from home for a certain number of employees	4% (8)	9.1% (2)	3.7% (3)	3.1% (3)	
Smaller number of employees in the office in the same time	1.5% (3)	0% (0)	1.2% (1)	2% (2)	
Regular testing of employees	0.5% (1)	0% (0)	0% (0)	1% (1)	
Physical barriers set	5.9% (12)	4.5% (1)	1.2% (1)	10.2% (10)	
Increased disinfection, wearing masks	3.5% (7)	4.5% (1)	1.2% (1)	5.1% (5)	
The working rooms are separated	0.5% (1)	0% (0)	1.2% (1)	0% (0)	

Numerical variables are shown through mean ± standard deviation (Minimum-Maximum). Chi-square test; bANOVA test.

4 Workspaces (according to the responses of the responders) were adjusted as follows (Table II):

- reduction of the number of working hours, work in shifts;
- use of protection equipment: masks, visors, personal disinfection and disinfection of workspace;
- separation of workspaces by covers, boards; complete reorganization of space in order to achieve necessary two-meter distance between the employees;
- natural space aeration/ventilation;
- installation of working boxes in open space offices;
- organization of meetings via online platforms;
- working from home and movement of the employees from open plan offices into traditional ones.

Table III Working location during the COVID-19 pandemic

	All [N=202] percentage (no. of respondents)	Employment Status percentage (no. of respondents)			p
		Employer / company owner [N=22]	Employed in the public sector [N=82]	Employed in the private sector [N=98]	
How did you operate your business during the Covid-19 virus pandemic, n (%)					
In the office	38.6% (78)	18.2% (4)	41.5% (34)	40.8% (40)	0.211[a]
Online	7.9% (16)	13.6% (3)	4.9% (4)	9.2% (9)	
Combined	53.5% (108)	68.2% (15)	53.7% (44)	50% (49)	
If you were isolated due to the Covid-19 pandemic, did you operate your work from home (online), n (%)					
Yes	56.4% (114)	90.9% (20)	52.4% (43)	52% (51)	0.003[a]
No	43.6% (88)	9.1% (2)	47.6% (39)	48% (47)	
Did your earnings change during the Covid-19 pandemic, n (%)					
Reduced	5.4% (11)	9.1% (2)	6.1% (5)	4.1% (4)	0.043[a]
Increased	5.4% (11)	4.5% (1)	0% (0)	10.2% (10)	
Remained unchanged	89.1% (180)	86.4% (19)	93.9% (77)	85.7% (84)	
How long have you been working from home (period of time), n (%)					
up to 1 month	25.7% (52)	36.4% (8)	20.7% (17)	27.6% (27)	0.397[a]
2-3 months	24.3% (49)	31.8% (7)	25.6% (21)	21.4% (21)	
3-6 months	12.4% (25)	18.2% (4)	14.6% (12)	9.2% (9)	
6-12 months	6.9% (14)	4.5% (1)	8.5% (7)	6.1% (6)	
I didn't work from home	27.7% (56)	4.5% (1)	28% (23)	32.7% (32)	
All the time	3% (6)	4.5% (1)	2.4% (2)	3.1% (3)	

Numerical variables are shown through mean ± standard deviation (Minimum-Maximum). Chi-square test; bANOVA test.

while the employees in the private sector were more satisfied than the others with the functionality, artificial lighting and aeration of workspace. Spatial conditions for work, such as aeration, air-conditioning and lighting, may also have a stimulation impact on work. Thermal and visual comfort may be achieved by multiple approach including adopted bioclimatic architectural principles and energy performances of transparent elements, with the respect for expected requirements of the beneficiaries of workspaces under extraordinary circumstances – such as during the Covid-19 pandemic.

Responders provided possible interior solutions in their responses, which would represent the basic designer guidelines towards a more economic and encouraging working environment.[4]

Working Location during the Covid-19 Pandemic

During the pandemic, one-half of responders (53.5%) worked in combined manner (online and in the office), only 7.9% worked fully online, while 38.6% responders worked exclusively in the office. Percentage arrangement in three observed groups is without statistical differences. Work from home caused by isolation was carried out by 90.9% company owners, 52.4% public sector employees and 52% private sector employees, p=0.003. Almost one half of responders worked from home up to one month (25.7%) or 2-3 months (24.3%), as displayed in Table III.

This segment of the survey to the greatest extent indicates the justifiability of the thematic framework of the research. The highest percentage of responders during the Covid-19 pandemic, more or less, experienced a combined working system, i.e. work from home as an enforced model. In the follow-up of the research, this shall open numerous questions that indicate the need for changing and adjusting the manner of business operations to a certain extent to new circumstances. Although the results of the questionnaire show that work from home lasted for maximum one month.

Experiences under new working circumstances shall be the topic of the next chapter and they can offer a platform for the examination of possibilities and a new concept of business in the future and outside the pandemic framework.

Work from Home

28.7% responders were forced to work from home during the Covid-19 pandemic, while the majority of those who worked from home were public sector employees (39%), p<0.001. The majority of the employees lived in two-bedroom flats (36.1%), while one half of responders (52.5%) shared their workspace

Table IV Organization of work from home during the COVID-19 pandemic

	All [N=202] percentage (no. of respondents)	Employment Status percentage (no. of respondents)			P
		Employer /company owner [N=22]	Employed in the public sector [N=82]	Employed in the private sector [N=98]	
Were you forced to work from home during the COVID-19 pandemic, n (%)					
Yes	28.7% (58)	18.2% (4)	39% (32)	22.4% (22)	<0.001[a]
No	44.1% (89)	22.7% (5)	45.1% (37)	48% (47)	
It was my choice	27.2% (55)	59.1% (13)	15.9% (13)	29.6% (29)	
The living space in which you live is by structure, n (%)					
Studio apartment	2.5% (5)	0% (0)	1.2% (1)	4.1% (4)	0.332[a]
One bedroom apartment	26.7% (54)	18.2% (4)	23.2% (19)	31.6% (31)	
Two-bedroom apartment	36.1% (73)	40.9% (9)	32.9% (27)	37.8% (37)	
Three-bedroom apartment	27.2% (55)	36.4% (8)	34.1% (28)	19.4% (19)	
Other	7.4% (15)	4.5% (1)	8.5% (7)	7.1% (7)	
The number of household members who did the work from home	1.21±0.78 (0-4)	1.45±0.74	1.39±0.77	1.01±0.77	0.001[b]
Number of household members who had online classes	0.86±0.86 (0-4)	1.09±1.06	1.01±0.94	0.68±0.7	0.015[b]
Did you share your workspace with other housemates during the working day, n (%)					
Yes	52.5% (106)	59.1% (13)	56.1% (46)	48% (47)	0.445[a]
No	47.5% (96)	40.9% (9)	43.9% (36)	52% (51)	
In which part of the apartment did you work most often, n (%)					
Living room	42.6% (86)	50% (11)	43.9% (36)	39.8% (39)	0.116[a]
Working room	11.9% (24)	27.3% (6)	13.4% (11)	7.1% (7)	
Bedroom	11.9% (24)	9.1% (2)	13.4% (11)	11.2% (11)	
Dining room	13.4% (27)	9.1% (2)	12.2% (10)	15.3% (15)	
Terrace	0% (0)	0% (0)	0% (0)	0% (0)	
I didn't work from home	20.3% (41)	4.5% (1)	17.1% (14)	26.5% (26)	
Did you have to adjust the living space to the needs of working from home, n (%)					
Yes	26.2% (53)	18.2% (4)	31.7% (26)	23.5% (23)	0.302[a]
It was not necessary	73.8% (149)	81.8% (18)	68.3% (56)	76.5% (75)	
Have you exercised your right not to work as a parent of a child under the age of 11, n (%)					
Yes	12.9% (26)	13.6% (3)	15.9% (13)	10.2% (10)	0.655[a]
No	40.6% (82)	50% (11)	39% (32)	39.8% (39)	
I don't have children / I don't have children of that age	46.5% (94)	36.4% (8)	45.1% (37)	50% (49)	
Did you share time and space with the children during working hours, n (%)					
Yes	39.6% (80)	40.9% (9)	45.1% (37)	34.7% (34)	0.444[a]
No	19.3% (39)	27.3% (6)	18.3% (15)	18.4% (18)	
I don't live with children	41.1% (83)	31.8% (7)	36.6% (30)	46.9% (46)	
Did you have to dedicate a part of your working time to helping children learn during online classes, n (%)					
Yes	27.2% (55)	40.9% (9)	28% (23)	23.5% (23)	0.361[a]
No	31.7% (64)	27.3% (6)	35.4% (29)	29.6% (29)	
I don't live with children	41.1% (83)	31.8% (7)	36.6% (30)	46.9% (46)	
How do you heat and cool your living space, n (%)					
Single air conditioning units	57.4% (116)	54.5% (12)	53.7% (44)	61.2% (60)	0.271[a]
Multi split system / central air conditioning	16.3% (33)	31.8% (7)	19.5% (16)	10.2% (10)	
Pellets. wood and heating oil	15.8% (32)	4.5% (1)	17.1% (14)	17.3% (17)	
Radiators	7.4% (15)	4.5% (1)	6.1% (5)	9.2% (9)	
Other	3% (6)	4.5% (1)	3.7% (3)	2% (2)	
Degree of satisfaction with working conditions from home:					
Functionality	3.39±1.32 (1-5)	3.95±0.95	3.07±1.35	3.52±1.31	0.007[b]
Level of natural light	3.9±1.13 (1-5)	4.27±0.88	3.8±1.15	3.89±1.15	0.223[b]
Level of artificial lighting	3.74±1.19 (1-5)	4.23±0.87	3.55±1.25	3.8±1.17	0.048[b]
Noise level	3.23±1.42 (1-5)	3.91±1.27	3.06±1.42	3.22±1.43	0.045[b]
Internet connection / stability	4.04±1.08 (1-5)	4.55±0.74	3.88±1.14	4.06±1.06	0.034[b]
Psychological impact	3.2±1.34 (1-5)	3.73±1.03	2.98±1.39	3.28±1.34	0.049[b]
How work from home has affected the quality of work?	3.56±1.12 (1-5)	3.64±0.9	3.38±1.17	3.69±1.11	0.160[b]

Table IV Continued

	All [N=202] percentage (no. of respondents)	Employment Status percentage (no. of respondents)			P
		Employer /company owner [N=22]	Employed in the public sector [N=82]	Employed in the private sector [N=98]	
Was your living space sufficient to meet the needs of your work from home, n (%)					
Yes	70.3% (142)	90.9% (20)	64.6% (53)	70.4% (69)	0.057[a]
No	29.7% (60)	9.1% (2)	35.4% (29)	29.6% (29)	
How has working from home affected the electricity consumption in your home, n (%)					
bills have been increased	32.7% (66)	31.8% (7)	40.2% (33)	26.5% (26)	0.148[a]
bills have been reduced	0% (0)	0% (0)	0% (0)	0% (0)	
not affected	67.3% (136)	68.2% (15)	59.8% (49)	73.5% (72)	
If you had the opportunity to choose the mode of operation DURING the COVID-19 pandemic, what would you choose, n (%)					
In the office	33.7% (68)	50% (11)	26.8% (22)	35.7% (35)	0.288[a]
On line	9.9% (20)	9.1% (2)	12.2% (10)	8.2% (8)	
Combined	56.4% (114)	40.9% (9)	61% (50)	56.1% (55)	
If you had the opportunity to choose the mode of operation yourself AFTER THE END OF THE COVID-19 pandemic, what would you choose, n (%)					
In the office	54% (109)	72.7% (16)	56.1% (46)	48% (47)	0.096[a]
On line	0% (0)	0% (0)	0% (0)	0% (0)	
Combined	46% (93)	27.3% (6)	43.9% (36)	52% (51)	

Numerical variables are shown through mean ± standard deviation (Minimum-Maximum). Chi-square test; bANOVA test.

with other household members during the day[5] (Table IV).

Responders expressed the greatest level of satisfaction in the conditions of working from home when it comes to the Internet connection 4.04±1.08, then the level of daylight (3.9±1.13) and the level of artificial lighting (3.74±1.19). Responders showed less satisfaction with the following aspects: functionality (3.39±1.32), noise level (3.23±1.42) and psychological impact (3.2±1.34). According to the employees, working from home has also influenced the quality of work (3.56±1.12). Residential space was sufficient to respond to the needs of the work from home, according to 70.3% of responders. The right to paid leave as a parent of a child under the age of 11 was used more by the employees in the public sector (15.9%), against company owners (13.6%) and private sector employees (10.2%).

The majority of responders (56.4%) said that they would choose a combined manner of work, if they had an opportunity to choose the manner of work during the Covid-19 pandemic, while 33.7% of responders would not leave the office and 9.9% of responders would choose the work from home. After the pandemic, nobody would like to work exclusively from home, but 46% of responders would like to remain in the combined manner of work. The number of those who want to work only in the offices increased (54%). These figures reflect the attitudes of all employees, regardless of the sector of work.

Having analysed individual parameters as the results of experience of the work from home during Covid-19 pandemic, several conclusions may be deduced. Our homes are being tested on flexibility and adjustability, along with new reality to learn and work simultaneously, during isolation period. Although the greatest number of responders during the work from home stayed in two-bedroom flats, the work was predominantly carried out in the living room. Only a small percentage of responders worked within their workroom. This data may indicate the fact that in today's practice, flats do not have workroom. Beneficiaries are forced to use living room and dining space for work. As opposed to socialist residence concepts in these regions that has working unit, today's concepts of residence exclude even the dining room as autonomous space. It is interesting that the highest percentage of responders thought that spatial conditions under which they worked fulfilled the needs of the work from home.

Having analysed all results mentioned above, related to the experience of work from home during the Covid-19 pandemic, it can be concluded that although forced to partially adjust

5 The highest percentage of responders (42.6%) worked in the living room, while 73.8% responders did not need to adjust residential space to the needs for work from home. On average, one family member worked from home (1.21±0.78), while approximately the same number attended remote school from home (0.86±0.86). The right to be absent from work as the parents of children aged under 11 years was exercised by 12.9% of responders, while 39.6% of responders shared the time and space with their children. During their working time, support to children in learning was provided by 27.2% of responders.

their work and residential space to the new conditions, the respondents shared it with other family members.

However, they were mostly satisfied with such a concept of work which is based on a combined business model. Such parameters change in favour of office space, when it comes to the business model outside the pandemic conditions. The Federation of Employers of Montenegro (2021) indicate the possibility of examining future business practices. The complexity of work from home is closely related to the gender of the employee, position in the company, number of household members, presence of children against their age (Ipsen et al., 2021).

Consequences of Working from Home during the Covid-19 Pandemic

With the aim of examining which independent variable influences the attitude of responders on whether in the post-pandemic period they would choose to work from office or they prefer the combined manner of work, we used the binary logistic regression. At first, the influence of each individual variable was examined by the univariant logistic regression. For easy reference, we provided only the results of the variables that provided a statistically important contribution to the explanation dependent variable. The multivariant logistic regression was implemented, whereby independent variables were all those that show statistically important results in a univariant analysis.

Individual statistically important predictors were distinguished[6] (Table V). In a multi-variant analysis, a statistically important contribution to the explanation of the preferences of the work from home or combined manner of work is influenced by the age (Wald=9.630, p=0.002) and level of satisfaction with the functionality of the workspace (Wald=9.828, p=0.002). The direction Exp(B) did not move, so we can conclude that older responders and those satisfied with the functionality of the workspace prefer office work/workspace.

If all the findings of the regression analysis are taken into account, which preference of combined manner of work or office work depend on is what was examined, providing the conclusion that this preference depends on personal characteristics of the responders (age), characteristics of workspace (functionality), conditions of work from home (noise level and psychological impact) and the consideration whether working from home influences the quality of work or not.

Discussion

The Covid-19 pandemic has significantly changed the perception of work and work attitudes of employed people. The results of the research, in case of Podgorica, indicate that the post-Covid model, besides a combined (hybrid) manner of work, emphasizes the need of the employees for the return in physical offices.

Developing a framework to address the complexities of the post pandemic return to the physical office highlighted the hybrid way of working (Work from Home & Office) as sustainable in the post-pandemic period (Sailer et al, 2023; Simanjuntak et al., 2023). It has also impacted the management in terms of cost. Sailer et al. (2023) also points 5 main topics that should be solved in the post-pandemic period, such as: work place for the staff and existing facility, spatial reorganization, the management adoption into new practice and new supporting technology. The human resource trends and innovations are essential to examine (Utama, 2023), by introducing employee wellness programs, flexible diverse and inclusive workplace that supports employee communication, well-being, productivity and engagement (Dias et al., 2023). The new office design should respect dynamic working schedules and functional needs organized by private and public circulation (Aksamija, Milosevic, 2023). Close to the home unit, a new office should have great daylight and accessibility to adopt home habits. The existing offices should make a renovation design process to adopt hybrid office structure into existing layouts. The new needs of hybrid workplace, both physical and digital, have to meet the needs of the post-pandemic environment (Kamis et al., 2023). Perspectives on workplace provide well-functioning spaces and a more comfortable and inclusive working environment, developing a framework for returning to the physical office (Sailer et al., 2023). Richter (2024) suggests the 3P model of hybrid work: "Practices, Protocols and Persistency", as optimal hybrid

6 Age (Wald=4.944, p=0.026), level of satisfaction with the functionality of the workspace (Wald=4.159, p=0.041), level of satisfaction with the conditions of the work from home: noise level (Wald=3.761, p=0.052), level of satisfaction with the conditions of the work from home: psychological impact (Wald=4.514, p=0.034) and the impact of the work from home to the quality of work (Wald=5.111, p=0.024).

Older responders prefer office work (Exp(B)=0.936, 95% C.I.for EXP(B): 0.883-0.992). Higher satisfaction with the functionality of the workspace, the responders prefer office work (Exp(B)=0.614, 95% C.I. for EXP(B): 0.384-0.981). However, responders that were satisfied with the level of noise in the conditions of the work from home Exp(B)=1.413, 95% C.I. for EXP(B): 0.996-2.004),

Table V Relationship between choices of work operation and research variables

Independent variables:	Univariate binary logistic regression							
	B	S.E.	Wald	df	p	Exp (B)	95% C.I.for EXP(B)	
							Lower	Upper
Age	-0.066	0.030	4.944	1.000	0.026	0.936	0.883	0.992
Degree of satisfaction with the functionality of the workspace	-0.488	0.239	4.159	1.000	0.041	0.614	0.384	0.981
Degree of satisfaction with working conditions from home: noise level	0.346	0.178	3.761	1.000	0.052	1.413	0.996	2.004
Degree of satisfaction with working conditions from home: psychological impact	0.444	0.209	4.514	1.000	0.034	1.559	1.035	2.348
The impact of working from home on the quality of work	0.472	0.209	5.111	1.000	0.024	1.604	1.065	2.416
Independent variables:	**Multivariate binary logistic regression**							
	B	S.E.	Wald	df	p	Exp (B)	95% C.I.for EXP(B)	
							Lower	Upper
Age	-0.070	0.023	9.630	1.000	0.002	0.932	0.892	0.974
Degree of satisfaction with the functionality of the workspace from home	-0.441	0.141	9.828	1.000	0.002	0.643	0.488	0.848
Degree of satisfaction with working conditions from home: noise level	0.120	0.128	0.873	1.000	0.350	1.127	0.877	1.449
Degree of satisfaction with working conditions from home: psychological impact	0.084	0.140	0.362	1.000	0.547	1.088	0.827	1.431
The impact of working from home on the quality of work	0.286	0.155	3.415	1.000	0.065	1.331	0.983	1.802

Dependent variable: If you had the opportunity to choose the mode of operation after the end of the COVID-19 pandemic, what would you choose: Physical in the office = 0, Combined = 1.

work arrangements across various organizational contexts.

A direct influence and experience of responders, consideration of advantages and disadvantages of previous and new models, lead to the conclusion that the key is in the design of workspace which will ensure adequate distance, a smaller number of users along with the respect of sustainability idea and reduction of negative influences for public health and environment. The employees regard the return to their office as the ground for resocialization, interaction, sense of belonging to the community, intense cooperation and live communication, better access to equipment and concentration to work (Colenberg, Keyson, 2021). The manner of work shall never be the same as before the pandemic, from the organization of work place to the perception of work. Bhamra and Lofthouse (2016) in book *Design for Sustainability* point out that sustainability is an approach to architectural design, which offers a wide range of design inputs, such as: environmental efficiency, responsible, holistic, contextual, restorative, visionary and synergy design, along with solving problems such as comfort, aesthetics and costs. A new standard in the design of offices is increasingly closer to the cellular type, since again the accent is put on "I" space against the "WE" space (Tanis, 2008). In the combined system of work place organization, the number of users of the space may be controlled, appropriate ventilation of individual cells may be achieved, and thus thermic and visual balance better achieved.

The results of this research indicate that for less than a year, the ratio changed significantly in favour of responders who wanted to return to their offices, so the percentage of 33.7% of responders who opted only for office work increased to 54%. Others approved combined manner of work, while nobody wanted to continue their work only on online platforms.

Although work from home may help the employees avoid long and stressful commutes and have more time for family, reaching the balance between professional and private life is impossible. Keeping the balance between professional and private life may be a particular challenge for those obliged to take care of the family, due to the closure of kindergartens and schools, in the absence of alternative care providing systems. Work from home frequently leads to blurring the borders between professional and private life, increase of working time and intensification of work. Work from home denies the boundaries of private life which may have a negative influence on the

as well as those who perceived the psychological impact of working from home as positive (Exp(B)=1.559, 95% C.I. for EXP(B): 1.035-2.348), but also those who thought that work from home had a positive impact on the quality of work (Exp(B)=1.604, 95% C.I. for EXP(B): 1.065-2.416) would prefer combined work (Table V).

In the multi-variant analysis, a statistically important contribution to the explanation of the preferences of the work from home or combined manner of work is influenced by age (Wald=9.630, p=0.002) and level of satisfaction with the functionality of workspace (Wald=9.828, p=0.002). The direction Exp(B) did not move, so we can conclude that older responders and those satisfied with the functionality of workspace prefer office work/workspace.

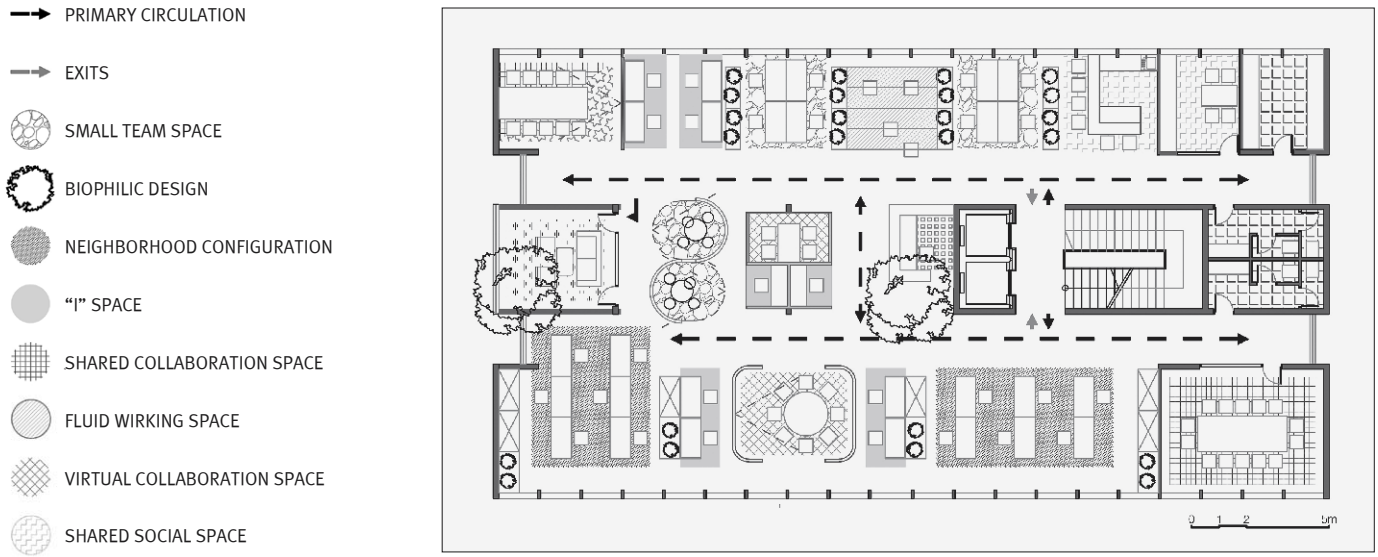

Fig. 2 From open-plan system to post-covid office that is environmentally friendly

wellbeing of the employees and reflect on the overall work performance.[7]

All the previous research was the motivation for providing a new model for the new hybrid environment, adopted from the existing work spaces, especially the open-plan office, presented in Fig. 2. The new office encourages socialization and work in smaller zones that can be properly conditioned. The primary workstations are located next to the openings and the employees are directed to each other. The scenes are resilient and changeable, the furniture is modular so that the employee can be alone or work in a group. There are open spaces, bars, kitchens, as well as reception areas. It also has elements for unconventional (fluid) work. Hybrid office should help to find balance between home and work, by finding possible shapes and variations of new offices, as well as those which might support desired organizational outcomes and strategies.

Thermal and visual comfort of workspaces may be achieved by a multiple approach including adopted bioclimatic architectural principles and energy performances, with the respect for expected requirements of the beneficiaries of workspaces under extraordinary circumstances – such as during the Covid-19 pandemic.

Conclusion

The Covid-19 pandemic has emphasized a number of limitations in the functioning of conventional workspaces. Such limitations are visible, even in advanced architectural working environments, particularly in terms of flexibility, adjustability, environmental and energy performances, microclimate and social and psychological wellbeing. The results of the questionnaire conducted within this research have demonstrated that physical spaces are still the most preferred working environment model, but insufficiently resilient to challenges, such as the recent pandemic. The overlapping of residential and working environment as the dominant solution for action under extraordinary circumstances, due to the need for the reduction of physical contact, has highlighted the challenges of other parameters such as: air quality, ventilation, thermic comfort, micro-climate, mental health, anxiety, relaxation and the like. The conducted study shows that it is necessary to define possible work scenarios under extraordinary circumstances, particularly in case of the overlapping of working, life and recreation activities. Virtual communication technologies, contactless activities, internet and similar may contribute to a more resistant organization of working conditions. The example of Podgorica in the results of the research has served to show that physical workspaces remain the preferred working model in the post-pandemic period with the possibility to adjust to the hybrid working regime. This indicates the need to question conventional models of architectural design of workspaces, as well as the need for the development of new design paradigm of these spaces with a considerably higher level of sustainability, resilience and safety. Based on the results of the questionnaire and a comprehensive analysis of available literature, a new hybrid model for resilient work environment has been proposed.

Future research should be conducted in order provide better conditions for employees in administrative offices, through architectural and design solutions, leading to well-being and a more productive work environment.

[Translated by Ivana Vučinić]

7 Parents who work might need to get involved in learning from home, monitoring and care of the children of school age, or there might be several family members who share the same space for online learning or work from home. 39.6% of employees had to share home workspace with children during the pandemic, while only 12.9% used the right to paid leave for parents with children under the age of 11. Family duties of workers, necessity of sharing workspace or even tension in a relationship or domestic violence may obstruct their working obligations, change the order of work and influence work performance and productivity.

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Source of illustrations

Figs. 1-2 Adapted from: Paunović Žarić, 2022

Authors' biographies and contributions

Sanja Paunović Žarić [S.P.Ž.], Ph.D., Teaching Assistant at the Faculty of Architecture, University of Montenegro. She obtained her Ph.D. in the field of sustainability, bioclimatic and energy efficient architecture. Her research is focused on the building envelope as a generator of thermal and visual comfort, with the focus on working spaces.

Svetlana K. Perović [S.K.P.], Ph.D., is an architect, lecturer and scholar, Assoc.Prof. and Dean of the Faculty of Architecture, University of Montenegro. Her research interests include urban perception, conceptual urban design, urban regeneration, transdisciplinary methodology in science, education and urban practice. She has published numerous articles in international monographs, journals, proceedings, etc.

Ema Alihodžić Jašarović [E.A.J.], Ph.D., architect and educator, Assistant Professor at the Faculty of Architecture in Podgorica University of Montenegro. She works on research related to theoretical aspects of the city identity, and is particularly interested in reviewing the role of architectural discourse in the construction of socio-spatial and visual identity.

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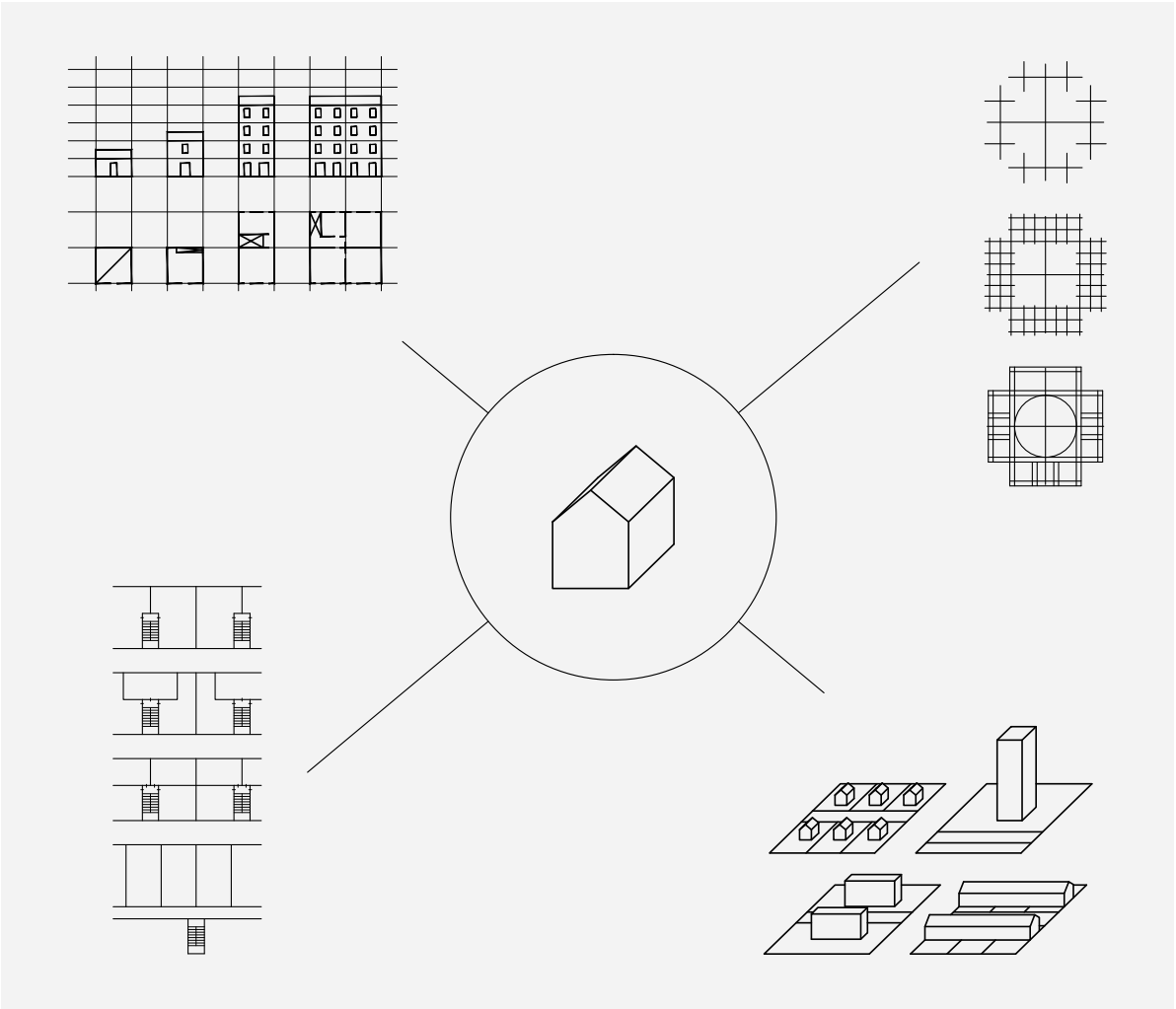

Fig. 1 The variety of typological concepts

Ante Senjanović

University of Zagreb Faculty of Architecture, Fra Andrije Kačića Miošića 26, 10000 Zagreb, Croatia
https://orcid.org/0009-0000-6645-4660

ante.senjanovic@inet.hr

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Question of Presence and Viability of Architectural Type as a Legal Rule in Croatian Urban Planning

ARCHITECTURAL TYPE
LEGAL RULE
URBAN PLANNING

"Type" can serve as a positive legal term in physical planning and a review of the literature clarifies its specific meaning, distinguishing it from its colloquial usage, where it is often confused with "class." In architectural theory, the meaning of "type" is rooted in concepts of similarity and indeterminacy, which parallels its meaning in legal theory, where it stands in contrast to the identity and determinacy associated with "class." This distinction establishes a fundamental limitation on the usability of "type" in legal regulation: the challenge of determining the meaning of a "type" in concrete situations, leading to potential legal uncertainty. An analysis of how the class of single-family houses is regulated in Croatian urban development plans reveals that "type" is typically used only as a general requirement for the conformity of building appearances with the surrounding built environment. Rather than relying on "type," the planning rules predominantly focus on objectively determinable quantitative values assigned to specific building classes.

INTRODUCTION

Ordinance on Spatial Plans[1] mentions the term „typology“ in two places: a residential building should be of a „typology prescribed by the spatial plan[2] in relation to the number of apartments, number of floors, form, etc.“ (PPP, 2023: art. 4.1.2.), and the plan can prescribe the building's typology when determining the requirements for the building form (PPP, 2023: art. 15.). What does the term „typology“ actually mean here?

This question could easily be addressed – at least regarding the legislator's intention – by consulting the administrative body that drafted the ordinance. However, the use of the term "typology" (which refers to a scientific discipline concerned with types, or a system of types) in place of the more accurate term "type" (which denotes a single concept that unites a group of related phenomena)[3] suggests an unclear and polysemous understanding of the concept of “type”. This ambiguity warrants further research into its implications and usage. Since physical planning is a form of legal regulation of land use, this research inevitably delves into the legal domain and will attempt to ascertain the normative relevance of the concept of “type” within the context of planning regulation.

Through a review of relevant literature on the theory of type in architecture and law, this article will primarily distinguish the precise meaning of *the term “type”* from other similar concepts commonly associated with this term. This distinction aims to establish a foundation for further exploration of the legal structure of spatial plans. The analysis will utilize examples from a specific category of national spatial plans to examine the role of typicality and type within the Croatian system of physical planning. This analysis seeks to answer the following questions: Which of the various meanings of the term “type” are present in that system, and how are they relevant to physical planning in its form as legal regulation?

TYPE AND THE UNDERSTANDING OF ARCHITECTURAL AND URBAN FORM

In this chapter, a precise meaning of the term „type“ shall be explored within the context of architecture and urbanism.

The PPP and spatial plans both fall under the category of general legal acts, for which precision of expression is crucial for their effective implementation. Therefore, the terms used should generally possess meanings that are clear and unambiguous (Milotić, Peranić, 2015: 34), or at the very least, convincingly explainable (Visković, 1989: 64). While the colloquial usage of the term “type” may be mostly clear in a professional context, clarifying the specific meanings of the term can enhance the legal dimension of planning. Given the subject matter regulated by these plans, the definition will be grounded in the theory of type within the field of architecture.

The use of the term „type“ in architecture appears against the background of general linguistic context, where type has a range of related meanings:

1. the fundamental form common to a group of objects or phenomena (Hrvatski jezični portal, 2024: tip 1., Hrvatska enciklopedija, 2024: tip 2., Duden, 2024: typus 2., Dicionário RAE, 2024: tipo 2.),

2. a group of phenomena that share similar characteristics or properties (Hrvatski jezični portal, 2024: tip 3., Hrvatska enciklopedija, 2024: tip 1., Duden, 2024: typus 1.a, Dicionário RAE, 2024: tipo 3., Larousse, 2024: type 4., Cambridge dictionary, 2024: type A.2, Merriam-Webster, 2024: type 1.a, 1.e),

1 Hereafter: PPP (following the original title „Pravilnik o prostornim planovima“). No official translation has been found, so the title was translated following the terminology used in the existing translations of regulations in the field of physical planning in Croatia.

2 A document which serves to „establish the purposeful organisation, use and intended purpose of space as well as the requirements for spatial development, improvement and protection“. (ZPU, 2013: art. 53. (1))

3. the ideal or exemplary specimen of that group, or an object that defines it (Hrvatski jezični portal, 2024: tip 2.a., Duden, 2024: typus 1.a, 3., Diccionário RAE, 2024: tipo 4., Larousse, 2024: type 1.,3.,7.,9., Merriam-Webster, 2024: type 4.b, 4.c), or

4. an individual member of that group (Merriam-Webster, 2024: type 1.c).

These individual aspects – similarity, exemplarity, and repeatability – imply an idea of similarity that links a group of individuals and is recognizable in each of them, or an idea of a recognizable individual representing such a group.

In professional usage, the concept of type commonly appears in the form of functional type and morphological type, so that typological debates typically focus on the correspondence between these two types (Forty, 2000: 304). Contrary to such a perspective on typology, which often leans towards simple and unambiguous classification (Oechslin, 1986: 37), a significant body of theory is devoted to a more nuanced investigation of the relation of type to form.

A key reference point for that is Quatremère de Quincy's 19th-century article „Type“ – the basis for many theorists' conceptions (Oechslin, 1986: 40). For Quatremère, type is an abstract, almost Platonic principle that governs the creation of form, both in nature and art (Madrazo, 1995: 201), and explains the roots of architecture by allowing for the recognition of history, nature, and function that defines the architectural object (Moneo, 1978: 28).

Quatremère defines it in the context of French classicism and the search for the resolution of conflicting conventions about classical orders, through a rational basis that would justify specific forms (Anderson, 1982: 110). His approach was influenced by Laugier's primitive hut, a protoform whose imitation leads to the development of architecture, as well as by the natural science concept of type (Madrazo, 1995: 171). However, he replaced the model of the primitive hut with the concept of type, considered as the principle of architecture – a deep structure inherent in and natural to material action within a given cultural context, which produces recognizable, typical forms and is accessible through typological reasoning: analogy, recognition of relationships, application of principles, and adaptation of approaches (Jacoby, 2013: 118, 123, 127).

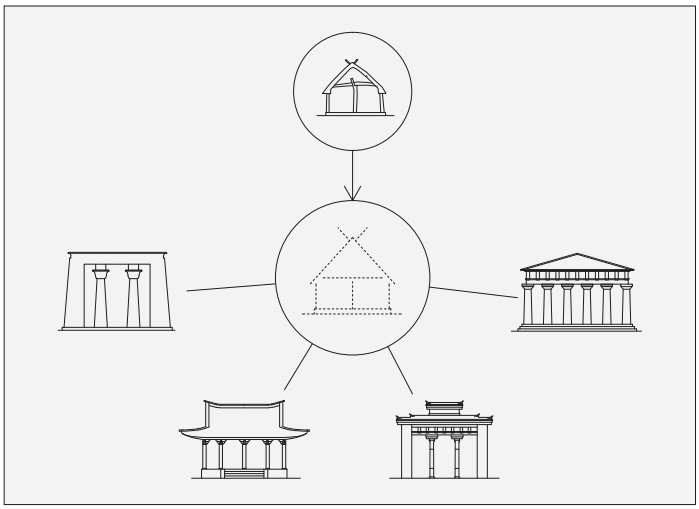


Fig. 2 Protoform as a precursor to type

In the 19th century, as a part of the effort to rationalize the chaos of eclectic architecture and define a style suitable for the era, the concept of type[4] continues to provide the rational basis of architectural forms in a particular culture (Martín Hernández, 1984: 59; Madrazo, 1995: 228). At this point, however, it begins to diverge significantly from Quatremère's purely conceptual idea: the predominantly compositional and taxonomic approach based on Durand[5] becomes the foundation for determining the form of the

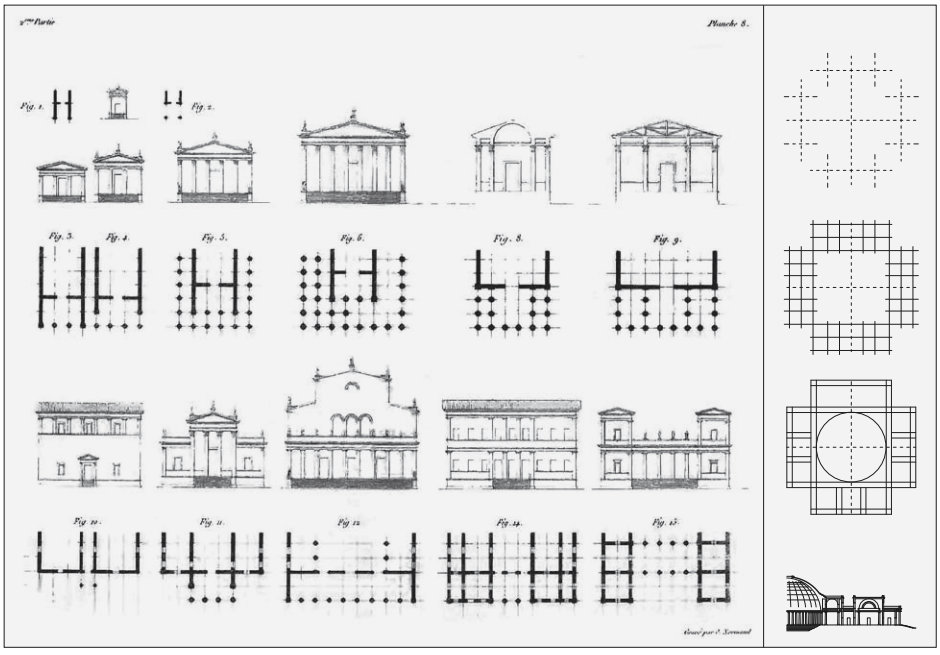


Fig. 3 Typology as taxonomy and composition

3 For more details on this, see next chapter of this article.

4 It appears relatively rarely in a direct sense (e.g., in Semper's writings), but there are related concepts. (Madrazo, 1995: 227).

5 Jean-Nicolas-Louis Durand, an architect and professor, published two books in the early 19th century as textbooks for his lectures at L'École Polytechnique. In these books, he systematizes architectural disposition and composition, and defines a rational, generic design method. (Jacoby, 2013: 64, 67)

building appropriate to its program (Martín Hernández, 1984: 60; Moneo, 1978: 28), bringing the related concepts of taxonomy and typology significantly closer.

The modernist concept of type developed this rationalizing line of thinking: type began to signify either the idea of a pure geometric form, free from stylistic deviations, or the idea of an efficient, functionally appropriate, applicable, and thus repeatable solution – a standard or prototype (Meninato, 2018: 57-62). In the crisis of late modernism, this strict, formal concept of type is replaced by a shift back towards Quatremère's more abstract approach. As a way to reconnect architecture with its context (Forty, 2000: 308), it became the theoretical basis for defining the architectural form that could be integrated into the city and its historical development – a tool for analysing the context from which principles of form could be derived (Moneo, 1978: 35; Bandini, 1984: 74). Through the idea of types acting as carriers of meaning (Forty, 2000: 309), it later evolved into a reduced, formalistic, and prescriptive conception, which gradually lost its theoretical relevance (Bandini, 1984: 80-81).

These concepts of type can be divided into two main currents:

1. type as an abstract idea, a foundation of a recognizable way of building – an indefinite concept that links similar phenomena; through its investigation, something can be learned about building in a particular context;

2. type as a design template – a compositional and formal solution to the relationship between function and form, i.e., an efficient, functional solution for a specific use.

The first of these, the idea of an abstract relationship between type and form, can be considered to be unique to type, while the idea of a template and repeatable solution is, in essence, classificatory – different from type, as we shall see in the next chapter. Thus, it can be argued that the specific meaning of type is tied to its indeterminacy, as an attempt to encompass, rather than to define, the essential similarity of typical objects. In that respect type presents a way of posing questions about why something has, or should have a particular form, or why typical forms exist or should exist.

How would form relate to type in the field of physical planning?

In planning, form is a contentious topic, primarily because planning pertains to ongoing and changing spatial relationships, which never conclude with a definitive, final form (Lendi, 1995: 127). But, if the strategic character of planning transcends the question of the specific form of individual interventions, it could be conceivably supported by a typological, abstract approach to form, based on the principles of building (Raith, 2000: 32). Expanded to, for instance, a typomorphological approach, it would allow for the development of urban form to be based on the maintenance, controlled transformation, or new formation of tissue types, made up themselves of various types of components (Kropf, 2017: 118, 213).

The urban tissue is constituted by the relationships between its components, so the analysis of the types of these components and the resulting tissue type – morphological analysis – becomes a significant tool for understanding the processes of urban tissue formation and their interdependence with the types of architectural interventions that comprise it (Panerai, Depaule, Demorgon, 2005: 76, 132, 160). It relies on the assumption that understanding the principles of the typological process (the emergence and development of types common in a given context) can help to plan accordingly (Caniggia, Maffei, 1995: 185) – and thus determine the manner of space utilization that aligns with socially accepted practices, and with the technical systems that guide building in that society (Habraken, 2000: 279, 252, 256).

This raises the question: can type, in this specific guise, also have a normative, legal role?

TYPE AS THE LEGAL EPISTEMOLOGICAL TOOL

A spatial plan is a by-law (ZPU, 2013: Art. 58) – in other words, a general legal act[6] (Žagar, 2018: 688). It regulates the use and protection of a particular space by specifying the requirements for carrying out interventions within that space, and is implemented by issuing the appropriate permit for carrying out those interventions[7], or, at higher levels, it contains guidelines for drafting lower-level plans and is implemented through the adoption of those plans (ZPU, 2013: Art. 53, 114, 15).

6 A general legal act is an act consisting of general legal rules, which abstractly and generally predicts and regulates certain, repeatable relations between people. (Perić, 1994: 103)

7 The content of the PPP, especially its Annex II, which determines the permissible kinds of interventions (mostly buildings) and the content of the implementation rules (mostly pertaining to the characteristics of buildings) allows us to equate the term "intervention" with the term "building" for the purposes of this paper.

8 Meaning that they can apply to an unlimited number of concrete situations sharing characteristics with that abstract description.

In this paper, the research is limited to the urban development plan (hereafter: UPU) as the lowest level of planning, which contains only the requirements for carrying out the building interventions within its scope (ZPU, 2013: Art. 80).

As a general legal act, UPU must be effective – that is, applicable: a person or a legal entity must be able to comply with the requirements, and there must exist a mechanism to enforce the law in cases of non-compliance (Kelsen, 2015: 156-157). The issue of effectiveness lies precisely in compliance: the person must know what one should do in order to comply with the regulations (Šarčević, 2013: 24), and, similarly, the governing authority that enforces the law must be able to assess whether the person has complied or not.

A general legal act necessarily consists of general legal rules (Perić, 1994: 103) that abstractly[8] describe the situation and the prescribed conduct (Larenz, 1992: 329). In UPU, they contain the requirements that buildings need to meet (PPP, 2023: Art. 54.). The required conduct can be represented as the obligation that the investor wishing to build a certain kind of building at a specific location must meet. Therefore, when obtaining a building permit, which confirms adherence to the relevant spatial plan, it is necessary to establish whether the building project reflects the properties[9] that UPU requires of that kind of a building (ZoG, 2013: Art. 106.).

In the application of law, this is a straightforward example of what is referred to as "subsumption": a logical inference that a concrete case, which shares relevant characteristics with the conduct outlined in a general legal rule, falls within that conduct (Larenz, 1992: 161). This process effectively categorizes the case as a member of the class defined by that rule. Consequently, the application of a general rule can be viewed as classifying a conduct as either legal or illegal, thereby triggering specific legal consequences (Larenz, 1992: 160). For instance, if the designed building falls within the class of structures defined by the rules of the UPU, the building permit is granted; if it does not, the permit is denied.

The issue then becomes how to assess if the concrete and the abstract properties are shared, i.e. equivalent (Larenz, 1992: 162). In architectural theory, one of the primary characteristics of a type is its indeterminacy, which implies a problem in determining the equivalence of typologically defined properties.

The concept of type once enjoyed a certain popularity in legal theory, but, while still present, isn't particularly significant anymore (Carlizzi, 2016: 93). However, the question of the theoretical legal importance of this concept is not as relevant to us[10], as the assumption that examining the significance of type in legal theory could further illuminate the relationship between architectural typology and the normative task of spatial plans.

Type is presented as opposed to the class (Strache, 1968: 21): as a concept that can simultaneously encompass both the individuality of its members and the generality of what connects them (Carlizzi, 2016: 97). The class is defined by an exact set of properties shared by all members of that class, and not by the other individuals; thus, it deals exclusively with generality which distinguishes that class from all others (Strache, 1968: 36). Type, on the other hand, is a concept based on comparison: if an individual is sufficiently similar to what are considered typical examples of the type, it can be attributed to that type (Strache, 1968: 53). Therefore, type is based on „family resemblance", where typical properties overlap between examples, but there is no single set of properties common to all examples.[11] Typicality arises from the interaction of properties, so an individual may, depending on context and other properties, have some sufficient property and not be typical, or have some unusual properties and still be typical (Kuhlen, 1977: 142-143). Typicality is recognized in the context of some purpose, a goal that the involved parties perceive as fulfilled through typical actions or objects (Carlizzi, 2016: 98, 102). This recognition depends on the attitudes of the individuals involved and the situation in which the type is being discussed (Strache, 1968: 39).

The fundamental criticism of this concept is that the idea of a dichotomy between type and class is outdated, and that the concept of typicality is based on intuitive, unsubstantiated, and thus arbitrary assumptions (Kokert, 1995: 276-277). The flexibility and freedom to adapt legal decision-making to the demands of real-life situations, which typological thinking is supposed to provide, are already available within legal reasoning (Ko-

9 The issuance of a permit also requires compliance with other regulations (ZoG, 2013: Art. 110), but that is not the subject of the UPU, nor of this paper.

10 Although it points to an area for future research, in which the normative role, or potential, of architectural typology concepts could be explored through the application of legal concepts that are currently considered more relevant in legal theory.

11 Except for some necessary, basic properties: the members of a type must already be connected into some basic kind, in order to coherently talk about a type – when we talk about a type of building, all its members must necessarily share at least the property of being a building. (Caniggia, Maffei, 1995: 69)

kert, 1995: 275). Legal reasoning is a complex process of interpretation, argumentation, communication, and the constant creation of law, which in both practice and theory is not just a simple model of subsumption (Müller, 1996: 210) – that is only one of the assumptions for the justification of legal conclusions (Alexy, 2019: 18).

A.H. Kaufmann therefore shifts type from the realm of positive legal terms into the domain of interpretation, positioning it as the foundation for both defining and interpreting the content of a general legal act (Seoane, 2002: 332). As an inductively formed idea of a „typical" life situation, it serves as a model for legal regulation, so that the class functions as a reduced linguistic and positive expression of type (Seoane, 2002: 352), or rather of its aspects. Type would then be based on the concept of the „nature of things": the assertion that a particular domain of life and its objects have an inherent, albeit fragmentary and roughly outlined, order or factual structure, and thus their regulation should conform to that structure – appropriate to the thing itself (Larenz, 1992: 222). In this context, type determines the reason for regulation: it identifies the original phenomenon through empirical recognition of typicality within a slice of reality, which, connected with the idea of law, gains an axiological and normative dimension, and so explains why and with what aim something is regulated in a particular way (Seoane, 2002: 332, 344).

Viewed this way, type becomes an epistemological tool, the foundation for the creation and realization of law. That parallels the architectural type: an analytical tool by which a conduct, or its causes and results (specifically: the built environment), is recognized as typical and desirable within a given context.

Kaufmann, in addition to recognizing such uses of type, acknowledges that it is always possible (albeit problematic) to use it directly as the content of a legal rule, by:

1. attempting to describe the type in detail and with precision (which turns it into a class definition, and no longer a type),

2. merely referring to it (which creates legal uncertainty, since the meaning of the type is inherently open and indeterminate), or

3. resorting to an exemplary method, citing examples to indicate the content of the type; it is then expected that the person applying the law will analogously conclude about the specifics of the case (Seoane, 2002: 333).

In the second and the third cases, the problem of the normative use of type remains its legal certainty: instead of proving the existence of a specific set of required characteristics, the predictability of a judicial decision regarding the conformity of specific conduct with the type depends on the context, on the existence of socially recognizable, conventional examples of the type, and on the ability of an expert to correctly assess typicality on those grounds (Strache, 1968: 39, 54, 58).

THE ANALYSIS OF BUILDING-CLASS PROPERTIES IN CROATIAN URBAN PLANNING

Whether the use of type can be detected in the general rules that make up the UPU shall be explored through the analysis of a set of properties used in a sample of UPUs to define a certain class of buildings.

UPU regulates a defined spatial area, primarily by demarcating public, unrestricted access area (streets, squares, parks, etc.) from the other areas (ZPU, 2013: art. 80., 3.) where access restriction and individual interventions for non-public purpose are possible. It further divides those areas into zones for certain purposes (ZPU, 2013: art. 80), which can also be subdivided into spatial units with their unique implementation rules[12] (PPP, 2023: art. 7.).

PPP defines which zone purposes are allowed, as well as which building purposes are allowed within each zone purpose (PPP, 2023: Prilog II).[13] A building of a given purpose can be subject to different implementation rules within different implementation-rule areas. Therefore, while a building class most often regulates all the buildings of a given purpose, it can also regulate only the buildings of a given purpose within a certain implementation-rule area.

The way those implementation rules are defined by PPP specifies which kinds of proper-

12 In Croatian: „pravila provedbe". Legal norms containing the requirements for buildings – that is, defining their required properties. The spatial unit is called an „implementation-rule area" (in Croatian: „područje pravila provedbe").

13 The practice currently taking shape indicates that the additional definition and limitation of the zone purpose through UPU could become the norm.

14 The plan must be published in digital form within the official electronic system "e-Plans". This system limits the ability to input different kinds of implementation rules to those prescribed by the system, and to a set of „other" implementation rules whose content can be developed according to the recommendations by PPP (PPP, 2023: art. 8.(2)).

15 They are often regulated in subclasses of detached, semi-detached and row houses. However, only detached houses appear in every analyzed plan, so they were taken as the object of research.

16 This refers to the now outdated statistical division of the Republic of Croatia into five regions: Central, Eastern, and Mountainous Croatia, as well as Northern and Southern Littoral. It is retained in this research,

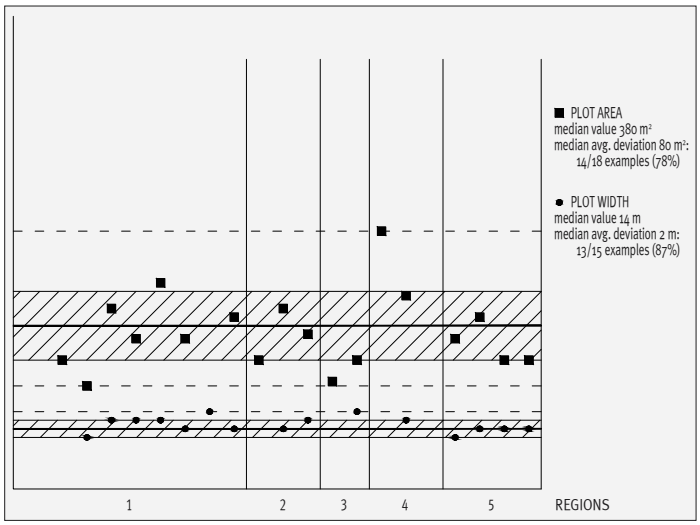


Fig. 4 Plot size values in the analysed sample

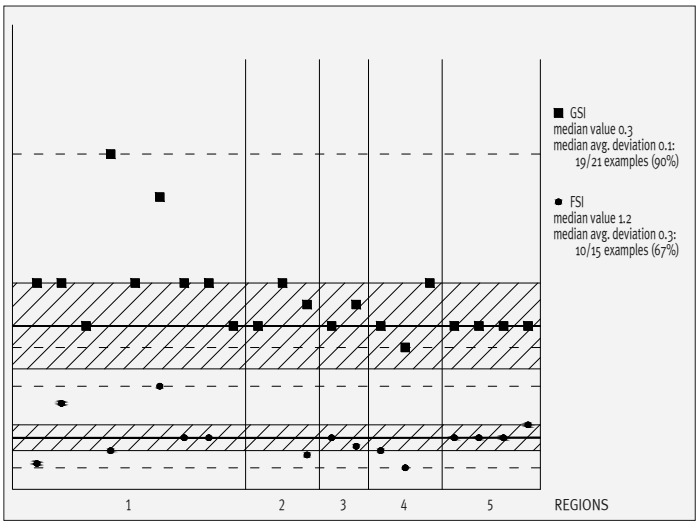


Fig. 5 Building area values in the analysed sample

ties must or can be included.[14] These include spatial indicators and other properties of buildings that determine their placement in space and their use (PPP, 2023: art. 8-21).

Based on planning experience, which suggests that individual (single- to three-family) residential buildings are the most frequently and extensively regulated building classes in Croatian urban planning, their regulation[15] has been elected for the following analysis. The research sample includes plans that were developed in accordance, or aligned with the current ZPU, and that also meet the following requirements: that for each region[16] there is at least one plan for a large city, a city, and a municipality, that each county is represented, and that each plan was drafted by a different planner.[17]

The analysis of the set of properties was structured according to the content of the implementation rules defined by PPP and divided into three sets of properties:

1. the content of the building (purpose)
2. the spatial properties of the building and its associated space
3. the construction prerequisites (procedures, infrastructural connections).

Only the second group was analysed, as the first essentially determines the building class to which the spatial properties apply, and the third group is mostly independent of the building class.

Since PPP is a new regulation, the plans in the sample were not created in accordance with it.[18] However, the legally established obligation to transform existing plans into the system defined by PPP suggests that there is an assumption of compliance between the content of existing plans and the new system.[19] The analysis confirmed this assumption to the extent that the identified properties could be fully categorized according to the content of PPP.

Out of 47 different properties identified within the analysed group, 31 appear in less than 1/2 of the examples, while 15 are regulated in more than 2/3. The values of those 15 predominantly present properties, determined by different plans, falling within the median absolute deviation in 2/3 or more of the plans where they appear (Figs. 4-7), and can therefore be considered to be the typical range of values for these properties.[20] The properties and their values are taken as an indication of a typical way of regulating this building class in national urban planning.

The set of typical properties can be taken to represent those characteristics of buildings whose regulation is generally considered to be important for the achievement of planning

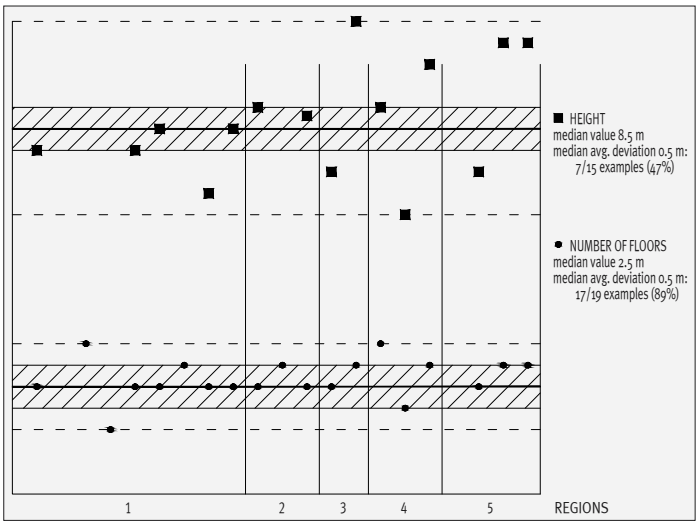
because it better reflects the geographical and cultural diversity of the country than the current division into statistical regions.

17 It was not possible to meet the requirement that each county be represented or for all three kinds of municipalities to be represented in each region. However, regional overlaps resulted in a sample that matches the number of counties: 21.

18 They followed the old ordinance regulating the content of spatial plans: Pravilnik o sadržaju, mjerilima kartografskih prikaza, obveznim prostornim pokazateljima i standardu elaborata prostornih planova. (1998) Republika Hrvatska. Narodne novine, 106/1998, 39/2004, 45/2004, 163/2004.

19 The author's experience of the transformation processes shows that this assumption holds, albeit with certain issues, mostly caused by a misunderstanding of the subject matter of UPUs by planners or relevant authorities.

20 The exception is the building height, where less than a half of examples fall within MAD, precluding the assumption of the typical height value.



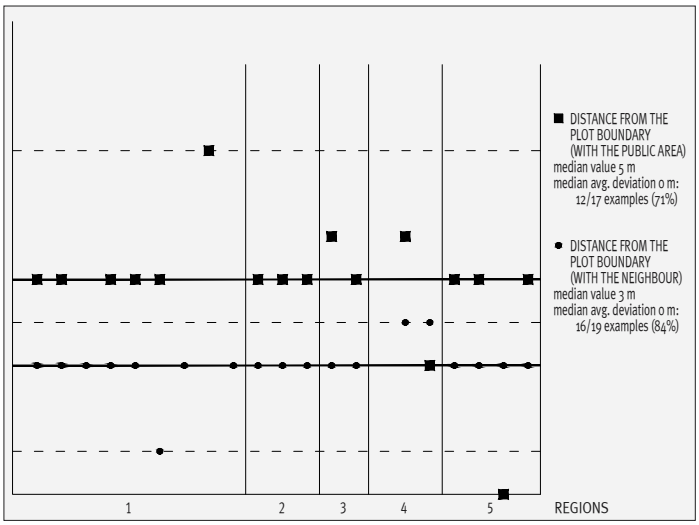


FIG. 6 BUILDING HEIGHT VALUES IN THE ANALYSED SAMPLE

FIG. 7 BUILDING PLACEMENT VALUES IN THE ANALYSED SAMPLE

objectives. This set can be ordered into the following groups:

1. purpose[21] – the fundamental assumption defining the building's content: which activities, and in what quantity, are allowed to be placed within the building and on the associated land;

2. size – the plot size (area and width), the building area (GSI, FSI)[22] and height (number of floors, height);

3. placement – the distance from the plot's boundary;

4. form – the general formal requirement (referring to the facades, materials, as well as size and the form of the building), roof form (shape, slope, openings);

5. open space of the plot – the amount of natural terrain and its content, height and material of the fence.

Almost all of these properties are expressed in clear, quantitatively defined values, usually as minimum or maximum allowed limits – giving them a classificatory and not a typal character.

A notable exception is the general formal requirement, which most often simply calls for the appearance of the building to be harmonized with the surroundings or the local (mostly traditional or regional) building style. This makes it an obvious example of a rule referring to a type (although type is of the most general sort): a typical way of building. It appears in 80% of analysed plans, but it is the only one of the 15 typically present properties which is a type- and not class-concept.

The values are mostly consistent across all regions. However, certain regional differences seem to emerge, which merits further research. They suggest the existence of regional variations in common building practices, in line with the typological principle that type is conditioned by context.

The professional planning experience suggests that this mode of regulation is similar for other building classes, with differences in typical values, and variations in the set of essential properties. However, additional research is needed to confirm this. Nevertheless, the object of analysis is sufficient to draw some general conclusions about typicality in Croatian urban planning.

CONCLUSION

The term „type“, in professional colloquial usage mostly refers to the purpose (function)[23] or spatial structure[24] of buildings. That is acceptable, both professionally and linguistically, since they can be taken as type-signifiers that refer to the recognizable ways in which those kinds of buildings are built in a given context. However, in legal context, they function as classes: each is a concept defined by a set of necessary properties which an individual needs to have in order to be considered a member of that class. Legal conception of type as an essence, the nature of something which connects similar individuals in an indeterminate way, parallels the theoretical concept of the architectural type. It is a universal concept, recognizable in its instances – the typical individuals – but is itself undefined. There is no set of necessary properties which would define the typicality of any individual, since it always needs to be judged within the context. In the concrete situation, typicality may require the existence of additional properties, or even the absence of those usually considered typical. Type, as opposed to class, is therefore a flexible concept, resting on the similarity instead of the equality of properties.

21 Although purpose was not the subject of analysis, it should still be presented as part of the typical properties that define a certain building class.

22 GSI: ground space index or lot coverage. In Croatian: kig (koeficijent izgrađenosti). FSI: floor space index. In Croatian: kis (koeficijent iskoristivosti).

23 E.g. residential, public or commercial. Possibly further divided into single-family, multi-family or collective housing, or into museums, schools, libraries, office buildings, banks, supermarkets, etc.

24 E.g. detached, semi-detached or row housing, or central-, corridor-, gallery-, courtyard-types.

25 It should be taken into account that class and type concepts don't need to refer exclusively to the building as a whole: a single property can also be based on the class (it is present if a set of necessary characteristics exists) or type concept (it is present if there are typical characteristics).

26 The anecdotal evidence of notable challenges in determining these properties in specific cases will probably be familiar to professionals. It can still be argued that, in ideal case, these properties are easily and objectively determinable.

27 It could be said that it is possible: through adaptation of the traditional type to the requirements of the modern context, set out by those rules – but in that case, the meaning of the type concept becomes even less clear.

Architectural type can be viewed as a value claim about the contextual fitness of buildings. As a universal concept, it cannot be expressed, but it can be approximated through an analysis, classification and description of the properties of typical forms. However, as mentioned, a form having those properties isn't necessarily a typical form. Thus, regulation by class doesn't necessarily realize the type and the value it contains. Rather, regulation by type, by requiring that a building of a certain kind be built in a typical way, might seem more efficient. However, since typicality always needs to be argued, the legal certainty of such a regulation is limited. Regulation should, therefore, simultaneously provide both the legal certainty, by defining class concepts, and the flexibility, using type concepts which, in a given context, ensure that the type is realised.[25]

The analysed plans contain almost exclusively class-based concepts: UPU defines the content of its area by assigning building classes to specific zones, and for each of these classes, a set of properties that each building must possess in order to be a member of the class is defined, thereby aligning with the plan and being permissible for construction. These properties are predominantly quantitative: spatial or measurable in terms of quantity, and thus relatively easily and objectively determinable.[26] The only significant type-based concept is the requirement for the building appearance to be consistent with the built or natural context, but this does not refer to a specific type of building or construction; rather, it represents a general demand for typicality. It appears in the majority of analysed plans, but makes for a tiny share of all the properties. Building types appear only as the building class markers, primarily as the purpose of a building, and more rarely as their plot situation (detached, semi-detached or row). Other building types don't appear in the analysed sample.

Architectural type doesn't appear to be significant as a positive legal term in the Croatian system of urban planning. However, its presence does point out a possible potential for the use of type concepts in planning. The requirement for the typical appearance of the building is often contradictory to the requirements set out by the class concepts: it isn't possible to achieve the form which would be consistent with the traditional or regional way of building – the architectural type – while at the same time adhering to the rules about the placement and size of the building which do not reflect that type.[27] The regulation making use of the legal concept of defeasibility – a possibility of deviating from the class concept required by the legal rule, in order to achieve a certain legal value – could incorporate the type concept to ensure the necessary flexibility. Further research in that direction would be of value.

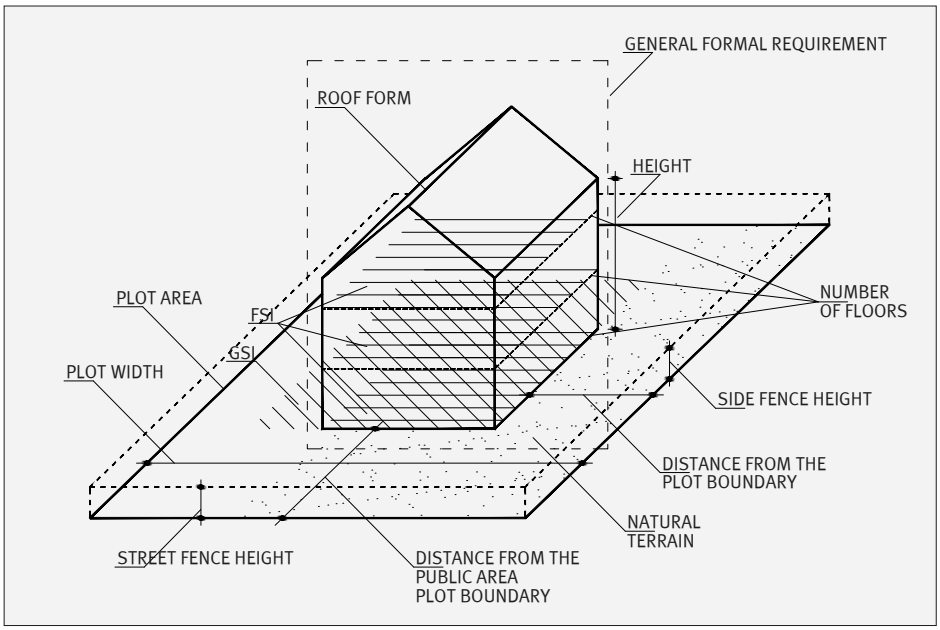


Fig. 8 The set of typical properties (author's drawing)

Research has also shown another dimension of typicality: that of the regulation itself. The analysed sample shows a typical set of properties and their values, most often used to define building classes. Where does it come from? Is it just a template-based method of regulation, adopting successful or simply common models? Or does it stem from alignment with the actual social conditions of spatial development and the resulting typical way of utilizing space? That suggests the need to not only research the planning methods generally utilized, but also the historical plans, to uncover patterns of regulation, their persistence and transformation. Identifying the presence of architectural and building types in those patterns would also contribute to the understanding of the role and potential of typological thinking in planning.

[Proofread by Vanja Šrajer, prof.]

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Figs. 1-2, 4-8 Author

Fig. 3 Durand, 1823. Processing and additional material by the author.

Author's biography

Ante Senjanović is a Ph.D. candidate at the University of Zagreb Faculty of Architecture. He works in spatial planning and is interested in the problems of translating the spatial phenomena into legal, normative expressions.

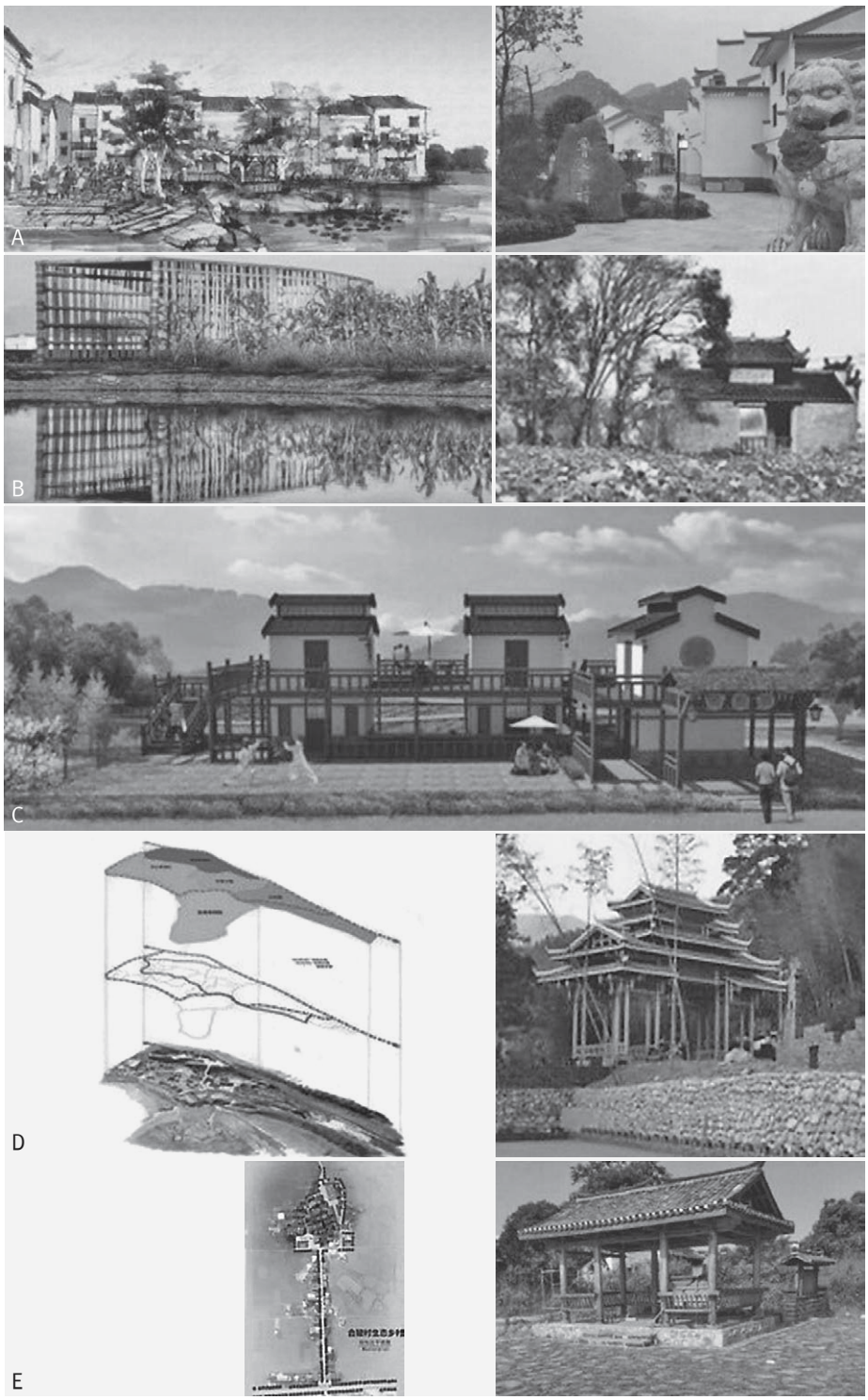

Fig. 1 Design solutions for the reconstruction of traditional Chinese settlements:
A – Lu Village and Guilin; B – Fuchuan County North MAO Family Ecological Village;
C – Ecological Village of Oak Tail in Mailing Town of Fuchuan Country; D – Long Tang Jiang;
E – Hebei Ecological Village. The use of modern building materials is accompanied by traditional building forms, decorative details and spatial organization (lion's sculpture, traditional roof ridges and matoujian elements, spatial placement of buildings in relation to water and trees and orientation to the cardinal points in accordance with Feng Shui requirements).

Min Li[1], Xian Hu[2]

[1,2] Guangxi Normal University, School of Design, Guilin, China

[1] https://orcid.org/0009-0007-9810-2660

[2] https://orcid.org/0009-0007-5327-3415

110367752@qq.com
xian_hu8675@gmx.com

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Semiotic Analysis of Chinese Folk Architecture in Modern Planning

architectural planning
architecture semiotics
Chinese folk architecture
national history of China

The study aims to explore the semiotics of the genetic symbols of Chinese folk architecture as the basis for representing the symbolic and mythological events of national history in the contemporary reconstruction of traditional settlements. The questionnaire-based survey, which involved 227 city dwellers and 239 residents of traditional villages, was used to assess architectural objects. As a result, the study justified the use of Chinese folk architecture symbols when implementing the Chinese state program for the traditional village revival, as well as when solving the problems of preserving the original historical architectural heritage in Western Chinatowns and in China itself. The mentioned symbols can be used to determine the conceptual approaches in architectural planning of traditional Chinese rural settlements.

Introduction

The concept of folk architecture is ambiguous, debatable and poses a certain challenge to scientific research (Zwerger, 2019). China is a very ancient culture with a great architectural heritage. The oldest fully preserved architectural monument is the Great Wall of China (the oldest fragments date back to the 3rd century BC); most of the oldest architectural forms are known from written sources and the preservation of elements of these forms in later monuments and surviving buildings. Most of the ancient construction was wooden and has survived to this day only in copies and inheritances, as well as in vernacular wooden architecture, which is confirmed by comparison with data from ancient written sources (Wang, 2017; Zhou et al., 2019).

Most historical buildings cannot be qualified as architectural environment for most of the population, the "folk". These are palaces, temples, administrative buildings (judiciary courts (yamen), district administrations, post stations, etc.), fortresses, etc. We are, in fact, talking about different types of architectural units that were built and used by broad layers of the population of the lower social strata: simple peasants, townspeople, poor merchants, etc., related to residential buildings, household outbuildings, small shrines, etc. This group of objects is referred to here as "folk architecture" because it was built by relatively "non-professional architects". Buildings built professionally are referred to as "traditional architecture".

As a result of the rapid economic and technological growth of the last five decades, China presents numerous results of the rapid urbanization of the 20th century that reflect the idea of domination over nature. This has led to the chaotic construction of skyscrapers observed in many large cities, the neglect of environmental issues, and the deterioration of several aspects of human well-being (Wang, 2017; Zhang et al., 2020). This problem is relevant for modern China since 1970s, as there are still many surviving traditional old houses that represent traditional folk architecture mainly in the first half of the 20th century, but also earlier up to the end of the 18th century, and have influenced the organization of internal and external living space. Traditional Chinese timber-framed architecture has a unique semiotic language that defines Chinese cultural identity (Koh and Lim, 2022). Architectural structures are important elements that not only represent historical and cultural value, but also determine the characteristics of the heritage and evolution of civilization, reflecting the sociocultural semantics and symbolism of significant values in the semiotics of buildings and structures, which determines the priority of the semiotic approach to its study (Aroni, 2023; Eskandani et al., 2022; Zhou and Wei, 2021).

Leach largely described the concept of the city as a Gestalt rather than as an organized spatial structure. This Gestalt reflects the accumulated experience of changes and layered states that reflect an understanding of its symbolic structure (Leach, 2017). Roland Barthes mentions Rome as an example of a contemporary city, where semantic contents associated with history are constantly opposed to the functionalism of urban stagnation. He saw space in the city as consisting of discourses that may even be unknowable in a given situation or context if the historical connection or understanding is lost (Barthes, 1997). The requirements of functionality may require the demolition of the useless Colosseum, but it is the essence of Rome and without it could Rome exist as a semiotic whole? – asks the semiotic theorist. This is a semiotic significance that accompanies almost all Chinese cities, which are often rarely less and mostly more than a thousand years old. These kinds of problems have both applied significances associated with problems of city planning and its development and reflect complex symbolic contexts that determine the behaviour of the population and citizens (Eco, 1997). A similar situation exists in the Chinese countryside, as many of the traditional rural settlements are older than some

cities and their associated cultural and symbolic contexts date back to the early dynasties before the middle of the 1st millennium BC (Yongting, 2022; Zhou et al., 2019). It is possible to apply to them the same semiotic problems that were considered by mentioned European thinkers in relation to the city as a specific phenomenon.

Regrettably, since the mid-20th century, the heritage of Chinese folk architecture has been undervalued by Chinese researchers and has received limited attention in the works of foreign scholars. However, interest in studying this subject has surged recently, primarily due to the Chinese government's initiatives to revive historical cities and rural settlements since the early 2000s (Wang, 2017). The Cultural Landscape Genes of Traditional Settlements (CLGTS) theory, proposed by P.L. Liu, aims to revive and develop traditional settlements. This theory focuses on identifying and studying the cultural landscape genes and folk architecture of traditional settlements, including their geographic context (Mei, 2017).

The environment serves as a vessel for regional culture, encompassing the social, historical, and cultural aspects of human life. Within this framework, the semiotics of architecture functions to preserve collective memory and convey significant cultural and historical information to future generations, based on the spatial narratives created by traditional buildings in their symbiotic relationship with the natural landscape (Dai, 2022; Xue, 2022). In China, the concept of a building's symbiosis with its landscape carries a deeper and more nuanced meaning, consisting of three layers. The first layer involves aesthetic compositional compatibility, allowing the spatial arrangement of a building to harmonize with its surroundings and be perceived as an integral part of the natural environment. The second layer focuses on the optimal technological placement of the building to enhance functionality – ensuring good lighting, protection from prevailing winds and groundwater, proximity to drinking water sources, and stable soil and foundation conditions. The third layer addresses the mystical relationship between the building's characteristics and the natural energy "qi," as well as the correct alignment of the building with the philosophical "Five Elements" of nature (Water, Earth, Fire, Metal, and Wood). These principles are well-established in a substantial body of specialized literature known as Feng Shui (Han, 2023; Kryżanowski, 2021). Feng Shui is the art and science of geomancy, which was widely used in ancient China and is a method of arranging buildings and arranging homes in accordance with the correct movement of qi energy in space, popularized throughout the world. The goal of Feng Shui is to harmonize the space where a person lives, attract health, happiness, money, and social success, and repel evil spirits, troubles, and diseases. Traditional Chinese astrology and medicine are closely related to Feng Shui. Feng Shui practices included the doctrine of placing buildings in accordance with the relief and orientation to the cardinal points, considering groundwaters, types of minerals in the soil, the placement of other buildings, rocks and trees nearby, etc. (Hassan et al., 2021; Kryżanowski, 2021).

Important for understanding not only the Chinese, but also the South Asian context as a whole is that contemporary urbanized people of this region adhere to beliefs associated with Feng Shui and use the services of magicians and geomancers specialized in Feng Shui, if possible (Han, 2023; Hassan et al., 2021). The design of the architectural style and form depends on the regional architectural features, among which the 'High Pedestal', 'Deep Cornice' and 'Elegant View' with their regional variations prevail in ancient Chinese architecture (Zou et al., 2023).

The conceptual basis of China's new economic and cultural policy is the preservation of rural heritage, the revival and social development of traditional villages as opposed to rapid urbanization (Zhou et al., 2019). Various approaches to preserving this heritage are under consideration and in application. This is the conservation of numerous surviving buildings and the use of their tourism potential; stimulating the development of local crafts and the preservation of traditional forms of construction in the regions with the assistance of the state and local administrations; support, advertising and government stimulation of the use of traditional elements of architectural design, spatial arrangement, etc. in contemporary construction (Zhou et al., 2019; Zhou and Wei, 2021).

Therefore, it is reasonable to study the semiotics of Chinese folk architecture in the context of representing the events of national history. A study such as this may solve practical problems of creating a contemporary ecofriendly and comfortable living environment, taking into account the ancestral experience of harmonizing the human living space and the surrounding natural landscape. The scientific novelty of the study lies in the theoretical justification of using symbols of Chinese folk architecture in contemporary residential construction, based on the semiotic approach. The practical significance of the study results is the possibility of using them

during architectural planning of traditional Chinese rural settlements and objects of contemporary architecture.

Literature Review

Although the process of Western-style modernization began later in China than in Western countries, it has had a profound impact on urban space development (Denison, 2018). An illustration of this modernization can be found in the contemporary architectural ensemble and its spatial and functional solutions present in Tiananmen Square (Chang, 2019). The current era is witnessing a revival of traditional Chinese culture as a symbol of national identity Chinese identity (Chang, 2019; Denison, 2018). Furthermore, this revival is built upon the interconnectedness of the past, present, and future (González Martínez, 2021). Among the notable elements of folk architecture in China are the original 'corridor bridges' known as langqiao. These corridor bridges can be found in six regions of China characterized by the presence of ancient cultures and states: Northern Fujian and Southern Zhejiang; Southern Anhui and the Jiangnan region; Southern Fujian, Southern Jiangxi, and Northern Guangdong; the Guangxi, Guizhou, and Southern Hunan border area; Hubei, Hunan, and Eastern Chongqing; and Yunnan and Sichuan. Collectively, these areas can be grouped into three regions in the northern, central, and southern coastal parts of China. Technically and architecturally similar, these bridges also exhibit regional ornamental and stylistic features. The historical and tourist significance of these bridges has only recently been recognized, despite their long-standing existence – some dating back approximately 2000 years – constructed with the same materials and techniques used for residential buildings and places of worship (Knapp et al., 2020).

Some scholars (Zhang et al., 2021) emphasize that while focusing on China's rural rejuvenation policy, it is essential to remember that the uniqueness of traditional folk architecture arises from various factors. These factors, which have shaped the interactions of communities with their surrounding landscape over long periods, sometimes millennia, include regional climatic conditions, ethno-cultural characteristics, historical events, and religious influences. Consequently, buildings founded on the principles of traditional folk architecture often exhibit advantageous characteristics, providing optimal land usage and comfortable living spaces. Such structures result from the accumulated practical experience that reflects the interactions of diverse communities with their environments. For example, entrances and main windows oriented towards the south ensure optimal sunlight, while maintaining distance from large trees prevents roots from compromising foundations, etc. (Han, 2023; Kryżanowski, 2021). Additionally, these architectural forms are adapted to the regional landscape and align with the lifestyle of the local population (Zhang et al., 2021).

Creating a residential architectural environment involves both environmental and social responsibility, reflecting the value and mental meanings, images, and historical traditions of the population (Fachun and Leontovich, 2020). The uniqueness of traditional Chinese settlement semiotics is based on the ordinariness and practicality of architectural planning. Architectural planning always considers regional landscape features as well as cultural, historical, religious, and ethno-specific traditions (Lee and Lou, 2019). Present-day Chinese urbanism combines the ambivalent nature of the latest digital technologies and ancient traditions. This creates a unique image of a contemporary high-tech and environmentally friendly metropolis as a historical continuation of ancient cities and folk architectural creativity (Liu et al., 2019; Wang and Feng, 2023). Such an approach to the development of contemporary Chinese cities ensures their environmental friendliness and economic profitability, makes them attractive for tourists and international commercial projects (He, 2021; Li and Kovacs, 2022). The studies of semiotics, such as this one, provide an opportunity to recognize the use of traditional motives in architectural objects and to reveal their socio-historical significance. These motives are typical both for the folk architecture of Chinese settlements and for the Chinatowns in other countries that retain their original national authenticity (Chu, 2020; Wang, 2020; Wu et al., 2020).

The semiotic significance of the traditional cultural heritage of China certainly consists in passing along the cultural and spiritual values, traditions, rituals and mythology that have developed over many centuries to future generations. However, it also includes the formation of respect for the historical past and the environment. These are two important components of the ethnocultural identity and a source of innovative development of national culture in the multicultural environment of the global society (Ding, 2020; Johnson, 2021; Wei et al., 2022; Zeng and Wang, 2021). The tasks of rural construction aimed at the revival of traditional settlements are to protect and renew the natural rural landscape and folk architecture along with its unique planning solutions and regional features (Yongting, 2022).

Problem Statement

Researchers consider studying traditional folk architecture semiotics to be one of the most effective ways of determining the criteria for the positive arrangement of living space in harmonious unity with the environment (Saidi, 2019; Zhang et al., 2020). The traditional village is of great historical and cultural value. The semiotic approach promotes its exploration with a view to preserving and reviving it in order to ensure the prosperity and well-being of the Chinese people (Bian et al., 2022; Huang et al., 2022).

The purpose of the study is to determine the significance and practical value of the semiotic factors of traditional Chinese folk architecture for rural and urban residents for the further use of research findings in the contemporary reconstruction of traditional settlements programs. In rapidly modernizing and technologically developing societies, as exemplified by China, there is a strong tendency towards the adoption of more contemporary forms and methods of construction, the Westernization of the urban landscape and the loss of traditional landscapes and architecture. However, folk elements in architecture over the centuries have performed important functions that may retain their significance for contemporaries. This determines the relevance and necessity of the research being carried out.

The objectives of the study are as follows:

1. To collect the most important elements of the semiotics of Chinese architecture, identified in the existing scientific literature;
2. To identify the most distinctive semiotic features of traditional Chinese folk architecture through a comparative analysis of representative contemporary architectural objects in China;
3. To determine the prospects for the practical use of the semiotic symbols in Chinese folk architecture for representing the events of the national history in contemporary residential construction.

Methods and Materials

Study design – The study was conducted in several organizational stages: (1) an analytical review of scientific literature sources on the problem of traditional Chinese architecture semiotics; (2) setting the objectives of the study; (3) determining the materials and methodological approaches of the study; (4) conducting research in the form of a survey based on a semi-structured questionnaire; (5) statistical processing and analysis of the results; (6) drawing conclusions and designating promising areas for further research. The paradigm of the semiotic analysis of folk architecture involves the use of qualitative and descriptive methods (Asadpour, 2020).

The methodology of the study revolves around the ideas embodied in the CLGTS theory developed by P.L. Liu (Hu et al., 2019). The theory was designed to solve the problems of reconstruction and revival of the architectural principles of traditional settlements in accordance with historical events and periods. It is based on ancient Chinese ecological thinking and philosophical understanding of the relationship between the human and the environment and combines qualitative, quantitative and bioinformatic research methods (Hu et al., 2019).

The methodological description of the CLGTS contains dialectical, morphometric, and structural aspects that include the concept of a socio-cultural gene as a meme, the regional features of which are viewed from the humanism standpoint (Hu et al., 2021). Furthermore, this theory covers architectural, cultural, spatial, and environmental features. The four CLGTS identification rules consider internal, external, local uniqueness and overall excellence of the architecture. These parameters are evaluated through fourteen factors and are determined using such identification methods as element, pattern, structure, and connotation (Hu et al., 2021). The CLGTS Tupu method how to further develop the CLGTS theory was created as an additional new tool for to assess the regional cultural characteristics of traditional settlements from a geographical point of view (Hu et al., 2021). The CLGTS method of semiotic genetic analysis of traditional settlements was used throughout the study. In this method, the identification of significant cultural features of folk Chinese architecture was based on attention to detail and such factors as form, ornament, layout, functional purpose, spatial arrangement, design features and structural elements (Hu et al., 2021).

The study analyzed materials from the conceptual reconstruction design of the following traditional Chinese settlements: Wutong Town, Lingui District, Guilin; Sitang Town; Wuliqiao (new immigrant village in Lingui District, Guilin); Shuanghe Shanty towns in Xiangxi; Lu Village and Guilin; Fuchuan County North MAO Family Ecological Village; Long Tang Jiang; Ecological Village of Oak Tail in Mailing Town of Fuchuan Country and Hebei Ecological Village.

Employing the method of semiotic genetic analysis has allowed for a comparison of the static and dynamic spaces of the traditional settlement architecture of different historical

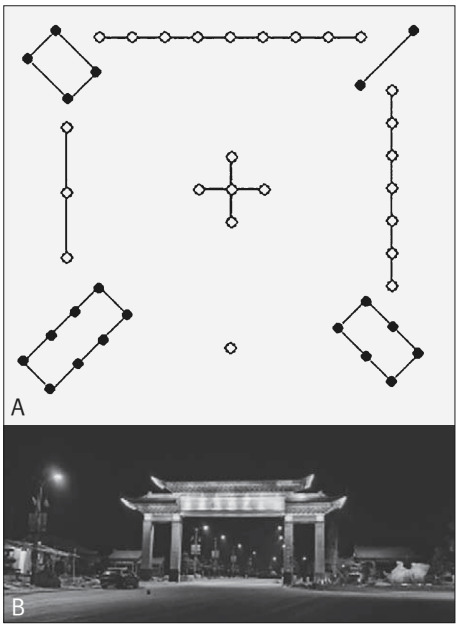

Fig. 2 A – Magic square on the shell of a mythological turtle from the Lo River; B – the concept of reconstructive landscape design of Wutong Town, Lingui District, Guilin (China's Traditional Village Protection and Development Research Centre, 1982; project fragment)

Fig. 3 'Matouqiang', Anhui County in Jiangxi, China. 1840s.

periods (Liu et al., 2019). The evolution of folk architecture was studied by collating information from scientific literature sources, geographical maps and plans, historical archives, as well as the results of the survey conducted in this study. The semi-structured questionnaire used for the survey consisted of 20 statements; the answers were assessed on a 5-point Likert scale (5 – strongly agree, 4 – agree, 3 – I find it difficult to answer, 2 – rather disagree, 1 – strongly disagree). It also included 5 open-ended questions regarding the arrangement of internal and external settlement spaces, architectural planning solutions, the preferred shape of residential and public buildings along with the design of their facade and interior, the choice of building materials, the provision of household amenities, comfort, cost-effectiveness and environmental protection. The questionnaire was valid since it included both regular and open-ended questions relevant to the purpose and objectives of the study, which allowed obtaining more accurate information.

Sampling – In total, 227 city dwellers from 17 large and medium-sized cities and 239 residents of 17 traditional villages located in different regions of China throughout its territory were invited to participate in the survey. The invitation and survey were conducted via email and interviews via electronic communication channels and telephone. Participants were randomly selected without differentiation by age, gender or any other social category. All of them agreed to participate in the survey. At the same time, no personal data other than confirmation of place of residence was used, collected, and could not be used in the future.

Statistical processing – Statistical processing and analysis of study results were performed using Student's t-test to determine the statistical reliability and significance of the results, as well as the correlation of the data obtained. Accumulation, sorting and visualization of information were conducted in the Microsoft Excel program; calculations were made using the Social Science Statistics online calculator.

Limitations of the study – The study's limitations stem from the specific nature of the subject being examined. As the definition of folk architecture and its components remains a topic of debate within the academic community, distinguishing traditional semiotic symbols of Chinese settlements can be ambiguous. Nevertheless, the use of a random sample of urban residents and traditional village inhabitants allows for the interpretation of the results as relatively significant. Furthermore, the study did not consider differences in nationality, gender, or age among respondents, though future research is planned to address these aspects.

Ethical issues – Ethical protocols were upheld during the study by obtaining written consent from all participants prior to the survey. Additionally, approval was granted by the ethical commission for the study's execution, and all necessary bioethical standards for scientific research were adhered to.

Results

The semiotic analysis of the traditional symbols preserved in the reconstructed settlements was primarily aimed at identifying cultural landscape genes that are important for understanding the historical past of the traditional Chinese village and its further development. Assessments given by townspeople and rural residents make it possible to assess the predominant value of elements of traditional architecture in order to make decisions about introducing these elements in the future in the construction of educational, housing, administrative or other facilities. The results obtained will allow us to determine functional and spatial solutions for the corresponding buildings. The need for such an assessment is due to trends towards modernization and extreme functionalization and westernization of architecture in areas of traditional development.

There are two main landscape-forming factors that can be distinguished in the studied settlements: mountainous terrain and water bodies. For instance, the urban area of Guilin is located in the southwestern part of the Nanling mountains on the banks of the Lijiang River. This type of location creates favorable climatic conditions for the settlements that have existed here since the third century BC. In the planning solution of the Lingui region settlements, which was formed in the era of the Qing Dynasty, the traditional folk architecture of China has preserved the famous image of the dragon, the most worshiped totem figure associated with the symbol of water and the fertility cults. In this case, the spatial solution was suggested not only by topographical conditions, but also by the symbolism chosen by the builders.

Along with the image of the dragon, the Chinese folk architecture often uses the turtle symbol related to it, which is also associated with water and flood prevention. For that reason, this symbol is reflected in the planning of traditional settlements, with water being one of the main landscape elements. According to beliefs of Chinese people, the turtle

and the dragon are soulmates, and they created the terrain together. The turtle shell is viewed as a square-shaped model of the universe. According to the CLGTS theory, the square itself is the gene that determined the most ancient forms of the spatial arrangement of Chinese settlements (Fig. 2).

Underestimating the importance of rural settlements has led to their decay. In contrast, the cities experienced a rapid population growth, which did not allow to create an ecological and well-organized cultural and economic environment in time. The result of these events was the appearance of shantytowns. This is the process of urban sprawl and the inclusion of rural settlements in their surroundings, which often retain their color and architecture. On the other hand, in China, many rural settlements grow into medium-sized cities within a short time, which creates a characteristic ensemble and features of the "urban village". They became an integral part of the residential infrastructure and social environment: provide better infrastructure typical for a city (electricity, high-quality roads, sewerage, heating, etc.), but preserve the way of life and the nature of the organization of the local community, more typical for a relatively independent rural community (Bian et al., 2022; Fachun and Leontovich, 2020). Eventually, they significantly impacted the image of contemporary cities and towns. The socio-economic role of an 'urban village' determines its historical and commercial value, as it attracts tourists who want to immerse themselves in the authentic atmosphere of ordinary historical Chinese life. However, many 'urban villages' are themselves cramped and narrow, lacking public spaces.

Reconstruction based on the principles of folk architecture appears to be a viable solution to these challenges. The Xiangxi region of China exemplifies the implementation of semiotic principles in architecture. It successfully integrates traditional symbols and signs into the design of a contemporary tourist city within its architectural landscape. The Xiangxi region is renowned for its distinctive vernacular architecture, characterized by intricate brick and wood carvings, alongside ornamental decorations of windows, doors, and screen walls displaying both geometric patterns and figurative representations of people, animals, and plants. These features may be referred to as "image symbols" or "composite symbols," conveying multiple levels of meaning and value.

In addition to these image symbols, Xiangxi architecture incorporates various "orienting symbols" that clarify spatial relationships and functional areas within structures and complexes. For instance, the placement of a 'swallow's nest' (tunkou) or a 'hearth' (huotang) within a courtyard or dwelling signifies the central location for social activities, industry, and rituals. The term "tunkou" in Chinese refers broadly to traditional decorative design elements that enhance the aesthetic value of spaces. The 'huotang' serves as a central hearth or fireplace, symbolizing family unity and fulfilling multiple roles in the home, including cooking, heating, and social interaction. Traditionally, this feature is positioned at the heart of the courtyard, fostering connections among family members and welcoming guests. Moreover, architectural elements such as the 'horse-headed wall' (matouqiang) or the 'head-facing gate' (chaomen) act as boundary markers that define the spatial limits of a complex while providing protection against fire and theft. The 'matouqiang' is distinctive in its design, preventing the spread of fire to neighboring homes by virtue of its height. Additionally, this architectural feature symbolizes a homeowner's status and signifies the attraction of prosperity, as its form resembles a herd of galloping horses (Fig. 3).

The term 'chaomen' encompasses various gate decorations, which may include imagery of deities, classic slogans and sayings, huabiao stone columns, and other decorative elements. For affluent households, a 'shigan-

Fig. 4 Shigandang, known as A Tai Shan stone, photographed by William Edgar Geil in November 1909, near Yangshuo (Stone Face Village), Guangxi province. The five ideographs have been freely translated: "I am Tai Shan: you dare not run over me". It is approximately dated to the middle of the 18th century. In contemporary construction, similar or stylized stones or images are used as a decorative element at the entrance to the territory of a house or residential complex.

Fig. 5 The revitalization of Shuanghe shantytowns in Xiangxi using the genetic symbols of a dragon and a turtle. The plan of the settlement tends to reproduce the outlines of the dragon's body; at the same time, individual buildings (the right side of the Fig. 5) and the placement of buildings within the settlement tend to reproduce the square section of the shell of the mythical turtle (compare Fig. 2 A).

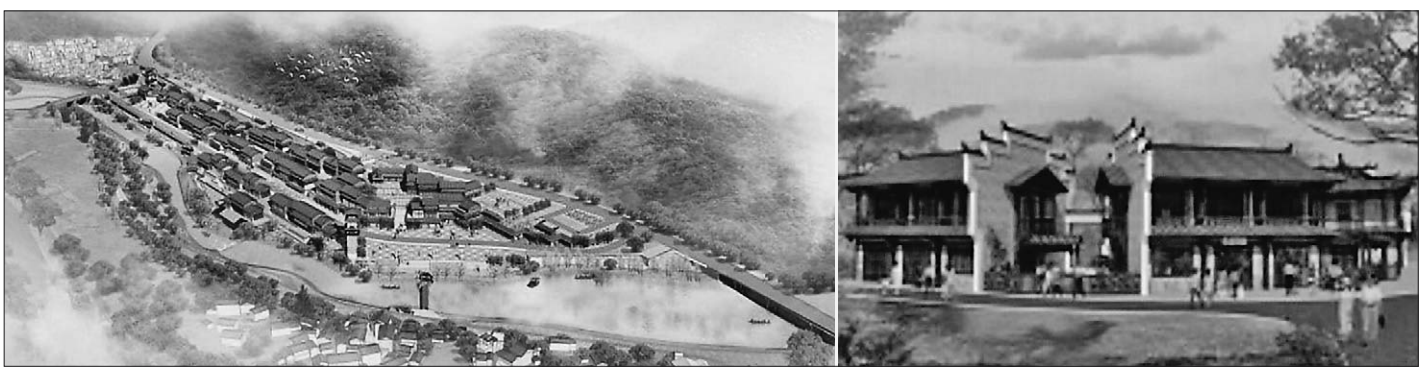

Fig. 6 Planning solution of the Sitang Town reconstruction. Traditional arched gates installed outside buildings organize the space in a specific way, separating the residential and commercial space from the area for the movement of ships and carts and the placement of trade caravans. The gates have administrative significance (they designate the administrative boundaries of the village) and mystical, protecting the place of residence from external harmful spirits.

dan' – a special stone placed at a distance from the entrance (Fig. 4) – was a common feature, aimed at preventing the entry of evil spirits.

Applying these symbols and signs to the design of a contemporary tourist town in the Xiangxi area offers a fascinating example of how traditional elements can be adapted and reimagined to meet contemporary needs and expectations. Thus, the project of reconstructing Shuanghe shantytowns in the city of Xiangxi uses the same dragon and turtle symbols that are typical for folk Chinese architecture and are also present in similar projects (Fig. 5).

This specific approach to the landscape design for revitalized settlements arises from a philosophical understanding of architectural semiotics, as well as an acknowledgment of the historical and sacred significance imbued in traditional symbols. These symbols exemplify intergenerational continuity and are intended to foster the economic, social, and environmental development of modern China.

Analyzing the semiotic approach to landscape design emphasizes the genetic relationships between settlement layouts, the arrangement of internal and external human living environments, and the natural landscape. A particularly noteworthy example is Sitang Town, often referred to as the 'Chinese Venice' due to its location on nine rivers that divide the village into eight parts, interconnected by 104 unique bridges. These picturesque arch bridges, often adorned with covered art galleries, embody valuable cultural heritage and necessitate preservation and careful reconstruction (Fig. 6).

Thus, by generalizing reconstruction approaches based on the semiotic analysis, we can identify a number of common genetic features that are to some extent present in the historical folk architecture of China and have been successfully used by contemporary architects (Fig. 1). The semiotic analysis has allowed us to identify such key constructive genetic features of architectural planning solutions for the reconstruction of traditional settlements:

– The placement of architectural objects in accordance with terrain features.

– Ensuring harmonious unity between internal and external spaces, as well as elements of earth, water, and sky.

– Utilizing mythological totemic symbols that represent well-being, prosperity, and strength.

– Employing natural building materials.

– Repeating traditional architectural forms.

– Incorporating traditional decorative elements into the design of architectural features and smaller structures.

– Balancing the utility and functionality of architectural objects with the aesthetics and philosophy of their cultural and historical meanings.

Through surveying both urban and rural residents, we gained insight into the significance of the primary semiotic factors that inform the conceptual approach to reconstructing folk architecture (Table I).

As can be seen from this table, there are some statistically reliable and significant differences in respondents' assessments. City dwellers pay more attention to the preserva-

Table I Comparative analysis of the survey results

Semiotic factors	GPA		Student's t-test	p
	City dwellers (A)	Villagers (B)		
Terrain-compiled planning solutions	3.8±0.5	4.2±0.6	−0.89	>0.05
Preservation of the historical settlement layout	4.4±0.2	3.9±0.3	2.4	<0.05
The use of natural building materials	3.6±0.8	4.0±0.5	−0.82	>0.05
Tourist attractiveness	4.5±0.2	3.9±0.2	3.41	<0.05
The provision of household amenities and comfort	4.1±0.3	4.8±0.2	−3.36	<0.05
Emphasis on the historical past of the settlement	4.5±0.2	4.6±0.1	−3.36	<0.05
Utility and functionality of planning solutions	3.8±0.4	4.4±0.2	−2.32	<0.05
The solution of social issues	4.0±0.2	4.6±0.4	−2.32	<0.05
The solution of environmental issues	4.3±0.6	4.5±0.5	−0.49	>0.05
Philosophical concept of the project	4.0±0.4	3.8±0.2	0.77	>0.05
The use of traditional mythological symbols	4.2±0.5	4.3±0.4	−0.27	>0.05
Security	3.9±0.3	4.4±0.1	−2.74	<0.05
Cognitive and educational value	4.6±0.2	4.8±0.2	−1.22	>0.05
Historical continuity of generations	4.6±0.4	4.7±0.3	−0.35	>0.05

tion of the historical layout of traditional settlements (4.4±0.2 vs. 3.9±0.3 points, $p<0.05$) and the attractiveness of traditional Chinese architecture for tourists (4.5±0.2 vs. 3.9±0.2 points, $p<0.05$). On the other hand, respondents living in these settlements (villagers) are more concerned about the provision of household amenities (4.8±0.2 vs. 4.1±0.3 points, $p<0.05$), security (4.4±0.1 vs. 3.9±0.3 points, $p<0.05$), the utility and functionality of planning solutions (4.4±0.2 vs. 3.8±0.4 points, $p<0.05$), as well as solving the social issues of the settlement (4.6±0.4 vs. 4.0±0.2 points, $p<0.05$). Both groups of respondents equally noted the importance of the historical past of traditional settlements (4.5±0.2 and 4.6±0.1 points, $p>0.05$), terrain-compiled planning solutions (3.8±0.5 and 4.2±0.6 points, $p>0.05$), the use of natural building materials (3.6±0.8 and 4.0±0.5 points, $p>0.05$) and the solution of environmental issues in rural settlements (4.3±0.6 and 4.5±0.5 points, $p>0.05$).

Moreover, they both emphasized the importance of the cognitive and educational value of traditional folk architecture objects (4.6±0.2 and 4.8±0.2 points, $p>0.05$) as well as the continuity of generations (4.6±0.4 and 4.7±0.3 points, $p>0.05$). This of course means that the two groups also consider the use of mythological symbols in the reconstruction process necessary (4.2±0.5 and 4.3±0.4 points, $p>0.05$), since such symbols are the archetypal basis of psychological confidence in well-being and prosperity. The correlation coefficient between the indicators of the studied groups is 0.29, which suggests that there is a direct, but not very strong correlation between them.

The typology of traditional rural architecture in China is difficult to define in general terms, since it combines the experience of many eras and many regions with significant natural landscape, climate, and cultural differences, as well as more than 50 national minorities in addition to the main culture of the Han Chinese. Therefore, the basis of such a typology of traditional rural architecture is most easily considered to be the semantic elements of traditional culture representing mythological ideas and adaptations to the environment. These elements give meaning to the building and fit it into the general discourse of culture. The distinctive typology of contemporary architecture lies precisely in the absence of these semantic elements of tradition, which were eradicated during the Chinese revolution and early Chinese Communist party governance since 1949 and the influence of the contemporary westernized architectural approach.

The mutual influences consist of two streams of change. Traditional rural architecture accepts elements of functionalism and technological improvements: the use of concrete and frame construction, engineering infrastructure inside buildings (cables, sewerage, water supply, etc.), typical Western formats of windows, doors, doorways, etc. Contemporary architecture, as shown in the examples, adopts elements of Feng Shui, orientation to the cardinal points, specific division of internal spaces according to their functionality, the use of round entrances and shigandan, the use of traditional magical and mythological symbols as important attributes of the building.

Discussion

The pronounced appreciation for traditional symbolism in architectural elements, shared among both rural and urban respondents, corroborates the perspective of researchers who describe traditional architectural forms as reflections of archetypal foundations of confidence and well-being (Zhang et al., 2021; Zhou et al., 2019). In a Chinese context, this connection is particularly pertinent given the historical evolution of geomantic practices, commonly recognized now as Feng Shui (Fengshui, n.a.; Liu et al., 2019; Shao and Zhang, 2018). These beliefs are deeply intertwined with traditional calendars, annual festivals, and the folklore of various regional groups within China. Accordingly, the preservation and incorporation of such elements in housing construction are likely to garner psychosocial approval from communities and enhance individual psychological comfort and a sense of well-being (Chang, 2019; Denison, 2018). Similar phenomena have been documented or suggested in various studies across other nations where traditional architectural elements and spatial configurations have informed residential, administrative, and urban design (Aroni, 2023; Asadpour, 2020).

Analyzing Chinese architectural objects through the lens of CLGTS theory highlights how spatial planning solutions derived from traditional settlements are informed by geographical features, underscored by cultural factors. This observation aligns with statements made by researchers (Hu et al., 2021) emphasizing the need to preserve traditional customs and their manifestations in Chinese architecture, known for their richness and cultural significance. The diversity of spatial forms within the CLGTS framework (Hu et al., 2021) stems from the geomantic approach to spatial planning and the necessity to address the functional requirements of architectural structures. For centuries, the spatial geometry of traditional settlements has been based on the concept of a spherical sky and a square earth, exemplified by the construction of houses and settlements in square layouts across northern China (Zhou and Wei, 2021). Furthermore, population migrations to southern regions with differing geomantic traditions led to the transition from square to round and elliptical layouts. Over time, more complex configurations emerged as a response to the nonlinear characteristics of natural environments (Huang et al., 2022). Researchers have validated the influence of migration and local heritage on architectural transformations as populations moved from rural to urban settings (Huang et al., 2022; Koh and Lim, 2022). This analysis underscores the enduring significance of traditional symbolic meanings within architecture for housing construction and their impact on residents' perceptions.

Within this geometrically complex environment, CLGTS theory sees orderliness and the desire to find ideal forms of architectural planning. This relevance is particularly acute in the context of contemporary urbanization trends, where modernism has often resulted in chaotic developments of skyscrapers, creating a disharmony within the arrangement of residential areas.

Moreover, the CLGTS framework emphasizes the genetic quality of self-repetition (iteration) within spatial structures and symbols. Architecture thus can be compared to social and humanitarian systems, as well as self-evolving natural systems, which also tend to utilize iterative elements. The genetics of cultural meaning is manifested in living space layouts, house shapes, and the use of decorative elements (Zhang et al., 2021; Zhou et al., 2019). The study indicates that the iterative design approach in contemporary architecture can enhance the organization of living spaces for urban residents while preserving a traditional landscape for rural inhabitants as rural buildings undergo modernization (Bian et al., 2022; Chang, 2019).

The findings of this study generally support the tenets of the CLGTS theory, and the survey results reveal various aspects regarding the significance of traditional vernacular architectural symbolism for the well-being of residents. Presumably, the validity of the CLGTS theory in understanding the semiotics of traditional Chinese architecture is rooted in the principles of its semantic interpretation. Architectural elements – including the orientation of buildings to account for cardinal directions, adherence to widely recognized Feng Shui principles, and the presence of specific features that reflect traditional beliefs – are interpreted by cultural representatives within their respective semantic frameworks. A "correct house", which meets these criteria and incorporates essential "protective elements" like shigandan, is perceived as a reliable home that brings health, prosperity, and good fortune to its occupants. Consequently, this framework supports a sense of anticipated well-being and social status (Han, 2023; Kryżanowski, 2021; Shao and Zhang, 2018).

The framework used in this study reflects principles similar to those applied in Chinese hieroglyphic writing, which relies on specific figurative representations that correspond to

the structure of the language and the objects within the surrounding world. The semiotic visualization model of CLGTS symbols is organized to construct architectural objects while adhering closely to their historical, cultural, socio-ethical, and environmental components in graphic, textual, and spatial contexts (Hu et al., 2021).

Conclusion

The rapid modernization of construction methods and materials, coupled with the urbanization of rural areas, has led to the loss of traditional settlements, rural landscapes, and unique architectural heritages. Folk architecture carries symbolism that continues to profoundly impact the well-being and sense of security among residents of both cities and villages. The primary objective of this study was to explore how traditional architectural folk symbolism can be applied in the contemporary reconstruction of traditional settlements. The semiotic analysis identified two key landscape-forming elements in the studied settlements: mountainous terrain and flowing water.

This research has argued that the semiotics of Chinese folk architecture is closely tied to traditional symbols such as the dragon and the turtle, both associated with water, flood prevention, and prosperity. The findings indicate that the turtle's shell represents a square model of the universe in folk architectural contexts, further supporting the CLGTS theory's assertion that this square is a core 'gene' influencing ancient spatial arrangements. A survey conducted with 227 urban dwellers and 239 residents of traditional villages revealed that both groups recognize the importance of semiotic factors, such as the cognitive and educational significance of folk architecture and the continuity of cultural heritage across generations.

The primary distinction between the two groups lies in their priorities: urban residents are more focused on the tourism appeal of traditional settlements, while villagers prioritize security and domestic comfort. The enduring influence of traditional architectural symbols on urban and rural populations, along with their assessments, underscores the necessity of integrating traditional architectural forms in space organization, interior design, and decorative elements for modern housing construction. It is posited that this approach can positively influence residents' personal well-being and sense of security, fostering a deeper connection to their cultural roots.

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Sources of illustrations and table

Figs. 1, 5, 6	Photos by the authors
Fig. 2	A – Fengshui, n.a.; B – developed by the authors
Fig. 3	Cultural Keys, 2023
Fig. 4	Tian, 2021
Table I	Authors' materials

Authors' biographies and contributions

Min Li has a Master degree. Min Li is a Lecturer at the School of Design, Guangxi Normal University, Guilin, China. Research interests: architectural planning, Chinese folklore, traditional villages.
Xian Hu has a Master degree. Xian Hu is a Lecturer at the School of Design, Guangxi Normal University, Guilin, China. Research interests: architecture semiotics, national history of China, cultural heritage.

Both authors contributed to the study conception and design. Conceptualization: M.L. Material preparation, data collection and analysis were performed by M.L. and X.H. The first draft of the manuscript was written by X.H. and both authors commented on previous versions of the manuscript. Both authors read and approved the final manuscript.

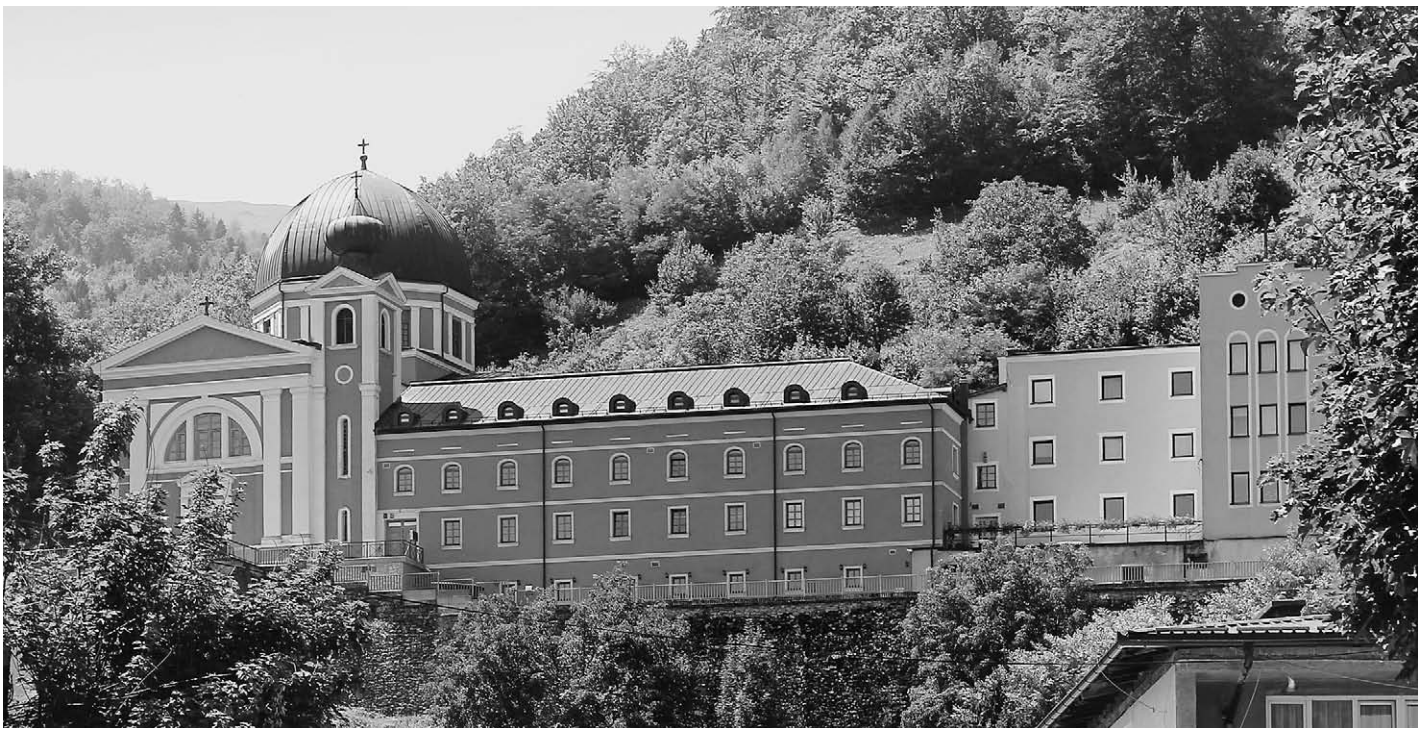

Fig. 1 The Convent and the Parish Church devoted to the Holy Spirit are located on the eastern slope of the Križ meadow, rising above the Fojnica River valley in the town of Fojnica in Central Bosnia: landscape view from Fojnica downtown

Miroslav Malinović

University of Banja Luka, Faculty of Architecture, Civil Engineering and Geodesy, Banja Luka, Bosnia and Herzegovina
https://orcid.org/0000-0003-3816-6586

miroslav.malinovic@aggf.unibl.org

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Architectural Heritage of Franciscan Convent in Fojnica (Bosnia and Herzegovina)

architect Josip Vancaš
architectural heritage
Convent Fojnica
Franciscan province Bosna Argentina
sacred architecture

The Franciscan Order has played a significant role in the Roman Catholic presence in present-day Bosnia and Herzegovina since establishing the Bosnian Vicariate in 1340. It has profoundly influenced the region's religious, cultural, and social development. The Franciscan convent in Fojnica, founded in the late 14th century, has been instrumental in this mission. Despite facing repeated destruction and subsequent rebuilding during the Ottoman period, the convent emerged as a crucial educational and religious centre. Architecturally, it evolved with substantial contributions from architects like Josip pl. Vancaš, who designed the Renaissance-Revival Style church in 1886. This paper delves into its rich history of resilience and adaptation, highlighting its significance in Bosnian Franciscan heritage and its role in preserving Catholic traditions amidst challenging historical circumstances. It examines the historical background of architectural heritage, focusing on a systematic analysis of benefactors, involved architects, and construction masters, a review of the architectural design, and an evaluation of its features.

INTRODUCTION

Since the foundation of the *Bosnian Vicariate* in 1340, Franciscans have been guardians of the Roman Catholic establishment in the territory that corresponded to present-day Bosnia and Herzegovina. Due to numerous historical circumstances, the diocesan hierarchy in Bosnia and Herzegovina was not established until 1882, which testifies to how deeply were Franciscans enrooted in ecclesial and profane life, playing an exclusively important role in preserving and upgrading the national, religious, and cultural heritage of the Croats, at the same time contributing to the social development of all religious groups in the country. During different historical periods, first as a vicariate, later as a province, Province *Bosna Argentina*[1] went beyond the country's borders to offer pastoral care to the Catholics, reaching as far as Hungary, Croatia, and Serbia.

The Province holds 16 convent sites in Bosnia in the present-day establishment, with three remote locations in Zagreb, Belgrade, and Đakovica. However, three sites – Fojnica, Kreševo, and Kraljeva Sutjeska – represent the most important convents in the Province, being the only ones to outlive the Great Turkish War (1683-1699; Jukić, 2023: 119; Novaković, 2023: 114). Besides that, the convent in Fojnica (Fig. 1) with one of his friars, Anđeo Zvizdović, played a historically utmost significant role in securing the freedom for Catholics in Bosnia when he negotiated the mutual recognition and safeguarding with Sultan Mehmed the Conqueror in 1463 (Gavran, 1990: 39-40).

During the Ottoman rule in Bosnia, the convent in Fojnica experienced periods of destruction and revival, each leaving its mark on the site's architectural heritage. With the arrival of the Austro-Hungarian rulers in 1878, the convent was completely revived and rebuilt to its present-day form. Following the final extension works in 1940, only interior and restoration works were carried out, leaving the Fojnica site as one of the best-preserved Franciscan sites in the Province. It still holds the original architecture dating back to the mid-19th century, a testament to its historical and cultural significance.

This paper assesses the history of architecture of known layers from the earliest documented stages of development of the Fojnica convent while at the same time showcasing the common historical facts and knowledge valid to place the architecture in the context. However, the most essential part of the complex is the church in Renaissance-Revival Style by Josip pl. Vancaš, which underlines not only the valley's architectural landscape but also the country's cultural image.

The bibliography and sources date back to publications from the Austro-Hungarian era when historians performed the first scientific research, accompanied by contemporary findings in published and archival sources with design projects. A thorough on-site analysis made the inductions and conclusions about architectural features and their assessment possible.

The Convent and the Parish Church of the Holy Spirit as a building ensemble (Fig. 1) and the mobile cultural assets within the library and museum are listed as the National Monu-

1 The etymology of the name Bosna Argentina: In Srebrenica, which refers to the "silver mine" near the Drina River on Bosnia's far eastern border, the Franciscan convent and the church of Saint Mary existed. According to its initial Roman name – *Argentaria* lat,, the name of the settlement gave its descriptive adjective to the whole Province – *Bosna Srebrena*, or *Bosna Argentina*, virtually meaning *silver Bosnia*. Moreover, the fortress that was located above the convent was named Argentina. Sultan Mehmed, the Conqueror, visited the Convent of Saint Mary while returning to Istanbul (Karamatić, 1991: 7; Stražemanec and Sržan, 1993: 176-177).

2 OFM (lat. *Ordo Fratrum Minorum*), Order of Friars Minor, a branch of the Franciscan order founded by Saint Francis of Assisi in 1209.

3 Ahdname (*achtiname* or *ahidnâme* tur.) is a type of Ottoman charter commonly referred to as a capitulation. During the early modern period, the Ottoman Empire called it *Ahidname-i-Humayun* tur. or an imperial pledge, and the Ahdname functioned as an official agreement between the Empire and various European states (Aksan and Goffman, 2007: 63-64).

ment of Bosnia and Herzegovina. The ensemble comprises the surrounding retaining walls, portable goods, and the graveyard with the chapel of Saint Michael. The latest addition, the third wing, does not hold the status of a national monument (*** 2023a).

The Franciscan Establishment in Fojnica

During the late 13th and beginning of the 14th century, Fojnica witnessed the establishment of its first convent and parish church devoted to Saint Mary. The construction of new convents and churches in the region was greatly aided by the contribution of Catholic miners hailing from Dubrovnik, Dalmatia, and distant Saxony, who worked alongside their priests, whose task was to retain pastoral care in their native languages: German and Italian. They were heavily included in constructing new convents and churches as well in Srebrenica, Olovo, Zvornik, and Kreševo, nearby Fojnica. While the exact details regarding the inception and timeline of the first Franciscan site in Fojnica remain ambiguous, its significance remains undoubtful (Batinić, 1913: 15-17).

The earliest reliable evidence of the Franciscan Monastery in Fojnica dates back to the year 1435. During this time, Friar Ivan, also known as Proboz, successfully negotiated his appointment as the guardian of the Fojnica convent. While some historical records suggest that the convent Fojnica might have been established earlier, likely towards the end of the 14th century, it existed after 1378. This conclusion is drawn because the convent is conspicuously absent from the earliest census records of the Bosnian Vicariate in that year.

The founding of the Franciscan convent in Fojnica itself played a pivotal role in the Bosnian Franciscan community, extending its authority over the entire left bank of the Bosna River up to the Sava River. Consequently, more than a half of Bosnia fell directly under its influence (Stanić, 1989: 64). The historical significance of the Franciscan Monastery in Fojnica cannot be overstated, and it continues to command reverence and respect.

It is unknown whether the site was destroyed during the first Ottoman campaign in Bosnia in 1463. It is recorded that the convent was repaired in 1478 but remained in modest proportions and not so crucial architectural condition. One demolition was recorded between 1521 and 1524, when the convent and the parish church were torn down. At the same time, convents in Konjic, Visoko, Kraljeva Sutjeska and Kreševo were demolished, too. Afterwards, permits for a new convent and church were requested in 1527, and only in 1594-1598 were they built. Later on, at the turn of the century, the friars moved to their current location, on the Križ hill (Batinić, 1913: 23-6; Stražemanec and Sršan, 1993: 224-227).

Unfortunately, this new site was destroyed soon after the great fire on 10th April 1664. Friars managed to rebuild the site: the convent in 1666-1668 and the church in 1669. It was consecrated on 31st August 1669 (Stažemanec and Sršan, 1993: 226-227). More than a century afterwards, the site was rebuilt, followed by the painful process of receiving permits from the Ottoman authorities. Except for the details of the new reconstruction that followed in 1798, guided by Friar Mirćetić and in 1830, no unique features, not to mention architectural data and properties, were recorded for these buildings (Batinić, 1913; Jelenić, 1915: 601; Karamatić, 1991: 56-57). The site was undoubtedly more oriented towards survival in that complicated period than introducing novelties in architecture and art production. Only in the supervening period, did friars in Fojnica manage to undertake some outstanding architecture that has been preserved until now.

Even though the fundamental rights and freedoms were secured for the Catholics in Bosnia, massive migrations followed the arrival of Ottoman authorities in Bosnia. Fojnica, along with convents in Kreševo and Kraljeva Sutjeska, managed to retain the formal and official status of the Franciscan convent, and they represented the main spiritual shelters for the Catholics in Bosnia during the centuries of the Ottoman era. That caused significant responsibilities for the friars, who had to exercise the pastoral care of Roman Catholics all over central and western Bosnia. The convent in Fojnica had a substantial role in educating the illiterate people in Bosnia. In 1847, Ivan Franjo Jukić founded a public school in Fojnica, which later rose to a junior gymnasium.

The convent area Fojnica currently holds parishes in Brestovsko, Bugojno, Busovača, and Gornji Vakuf/Uskoplje. The parish Fojnica is under the jurisdiction of the Roman Catholic Archdiocese of Vrhbosna, Sarajevo.

Convent of the Holy Spirit

The Convent of the Holy Spirit in Fojnica has been in uninterrupted function since the very beginning of its existence, unlike numerous other Franciscan convents all over the Province. The convent is distinctive due to its remarkable role in the history of Bosnian Catholics and Bosnian history in general. One of the most valuable documents for OFM[2] Bosna Argentina, *Ahidnâme* tur.[3], given to Friar An-

FIG. 2 AHIDNÂME, GOUACHE PAINTING DONE BY ĆIRO TRUHELKA

đeo Zvizdović, is just one of the highlights of the Convent in Fojnica (Fig. 2).

In 1463, when the city of Jajce fell under the Ottoman siege, Friar Anđeo used the opportunity to meet Sultan Mehmed the Conqueror, who had been on his way from Jajce, where he executed the last Bosnian king, Stephen Tomaševic of Bosnia. They met in Milodraž, near Kiseljak, where Friar Anđeo offered the Franciscan and Catholic recognition of their rule in Bosnia. At the same time, Mehmed II gave his word to protect the rights of Catholics and Franciscans as official representatives to employ their religion and maintain their freedom, buildings, and possessions. It was officially confirmed in *the Ahidnâme*, written at the time and place they met (Gavran, 1990: 39-40).

The Oath (ahidnâme) of Sultan Mehmet II the Conqueror

Mehmet the son of Murat-Khan

Always victorious!

I the sultan Mehmet-Khan inform all the world that the ones who possess this imperial edict, the Bosnian Franciscans, have got into my good graces, so I command:

Let nobody bother or disturb those who are mentioned, not their churches. Let them dwell in peace in my Empire. And let those who have become refugees be, and safe. Let them return and let them settle down their monasteries without fear in all the countries of my Empire.

Neither my royal highness, nor my viziers or employees, nor my servants, nor any of the citizens of my empire shall insult or disturb them. Let nobody attack, insult or endanger neither their life nor the property of their church. Even if they bring somebody from abroad into my country, they are allowed to do so.

As, thus, I have graciously issued this imperial edict, hereby take my great oath.

In the name of the Creator of the earth and heaven, the one who feeds all creatures, and in the name of seven Mustafas and our great Messenger, and in the name of sword I put, nobody shall do contrary to what has been written, as long as they are obedient and faithful to my command.

Written on 28th May 1463

In Milodraž

The convent site consists of the church and two convent wings, placed on the site linearly, aligned with the slope of the Križ hill. Between the upper retaining walls on the western side and the convent, an inner courtyard is enclosed by the building on one side and a natural environment on the other.

The construction of the latest and the most crucial sequence in the history of the Convent began in 1863, following the journey of Friar Mijo Zubić to Bavaria and Vienna in 1860. During and after the *Tanzimat* era (1839-1876) featuring imperial reforms, the situation for non-Muslims was far better than before. Hence, Bishop Šunjic, the Provincial Superior at the time, provided permits for new convents and churches. To raise as much as possible for the funding of the construc-

4 Ante Ciciliani was born on 17th February 1815 in Trogir, a Croatian town in Dalmatia. There is little information on Cicilani's life. He participated in several constructions in Trogir and a convent and parish church in Imotski, Dalmatia (1863-1867). However, projects in Guća Gora and Gorica for OFM Bosna Argentina remain his most prominent works (Ivanišević, 1989: 356; Karamatić, 2009: 218).

5 Matija Lovrinović, construction master from Fojnica, known for his activities during the mid-19th century.

6 Johann and Franjo Holz, construction masters, uncle and nephew, often referred to as the architects from Slavonska Požega, worked at the turn of the century, mainly in Croatia and Bosnia, with several engagements for Bosna Argentina – Gorica, Tolisa, Bistrik, Plehan, Kraljeva Sutjeska etc.

7 Scholarly sources don't contain a lot of data on builder and construction master Špiro Maric. Besides his engagement in Fojnica, he is recorded as being involved in the construction of a church in Gorica, Livno.

8 Franjo Lavrenčić was born in 1904 in Ljubljana and died in 1965 in Austria. In 1923, Lavrenčić started Senior Technical School in Ljubljana, and in 1928, the Faculty of Architecture in Prague. He studied for only one year, after which he abandoned the studies in favour of the "will to create the architecture". Ever since 1931, he lived and worked in Sarajevo, producing several designs in both Sarajevo, Zagreb and Belgrade, practising early Modern style in domestic architecture. Besides two projects for OFM Bosna Argentina – Extension of the Convent of the Holy Spirit in Fojnica and the complex of Convent of Saint Nikola Tavelic, today Convent of the Exaltation the Holy Cross in Kovačici, the majority of his projects were residential and public buildings.

One of his most prominent commissions was the series of projects for the residential complex Crni Vrh, which included other designs of very well-known architects at the time: Dušan Smiljanić, Bruno Tartalja, Danilo Kocijan, Franc Novak, Mate Bajlon, and Stjepan Planic. His other single-family houses are: a house for I. Kapetanović in Podhrastovi, a house for Leon Kahij, a house for brothers Finci etc. In the post-war era, he was commissioned for several projects in Zagreb and Tuzla (Commission to Preserve National Monuments).

Fig. 3 The Convent and the Parish Church of the Holy Spirit, Fojnica: view of the link between the church and first wing from the inner courtyard

Fig. 4 The Convent of the Holy Spirit, Fojnica: view of the link between the first and second wing from the inner courtyard, on the left, wing built by Franjo Lavrenčić in 1940, on the right re-built building of the first wing, built in 2001

tion works in Fojnica, Friar Zubić left for Western Europe. Soon, he got most of the needed financing. On 18th August 1863, the birthday of Franz Joseph I of Austria, the foundation stone of the new convent was laid.

The project was done by Ante Ciciliani[4] from Trogir. Ciciliani also participated in the construction campaign of the convent of Saint Peter and Paul in Gorica, Livno, and the parish church of Saint Francis of Assisi in Guća Gora. Until 1865, Matija Lovrinović[5] led works, but not everything went according to plans. Lovrinović managed, from the spring of 1864 until 14th September 1864, to build the convent and put it under the roof, but soon, supporting walls started to collapse, and the convent was endangered. Two specialists involved in construction campaigns all over the Province, uncle and nephew Johann and Franjo Holz[6] inspected the site and discussed the measures to be implemented to secure the buildings. The friars dismissed Lovrinović and hired Špiro Marić[7] from Vis Island, Croatia, who was also involved in construction works in Gorica-Livno. He continued work in 1865 and built additional supporting walls, making the surrounding ground more solid and firm (Karamatić, 1991: 57; Batinić, 1913: 115-117). Interestingly, Johann Holz was commissioned again in 1884 to extend the wing, but the works never took place according to his project (*** 2010: 17).

In 1913, along with the repair works of the church built in 1888-1889, the convent was thoroughly repaired, too: housing premises, museum with library, furnishings etc. (Batinić, 1913: 128).

The second wing, attached to the northern side of the first one, was built in 1940, according to a project made by architect Franjo Lavrenčić[8] (Karamatić, 1991: 57). Just after the thorough analysis of poorly available data about the first wing, it can be concluded that after the construction of the first wing and second one in 1940, one part of the first building was demolished: it matches three additional window axes – which are now visible on the main façade. Architect Lavrenčić, who was at the same time engaged in a project of the new convent and theology in Kovačići, Sarajevo, did the project for the second wing. It is connected to the first one, in the place of the demolished building part, and polygonally placed on site to close the third side of the inner courtyard. However, this second wing did not introduce any contemporary architectural novelties, although it was already the era that got underway in Modern architecture. Separately analysed, it does not hold any of the illustrative details which could be related to the sacred background of the project. The prominent façade is oriented towards the town, facing the east. It reveals the central corpus, which was made as an Avant-corps. This part of the façade holds three vertical stripes of rectangular windows, outlined with arched decoration in plaster, crowned with three aligned oculi on top of each line. The rest of the building lacks identity; one could easily misplace it with a residential house.

During the period between 1949 and 1959, local authorities, in line with the policies of the communist regime in former Yugoslavia, seized one part of the Convent. However, the Convent's resilience shone through as the housing wing was thoroughly repaired and renovated between 1987 and 1990. This resilience was further demonstrated in the post-war era when all façades were refreshed and recoloured, a testament to the enduring spirit of the Convent (Figs. 3 and 4).

Interestingly, the first wing of the convent was partly demolished in 2001; it was rebuilt, retaining the main principles of the design,

FIG. 5 THE CONVENT OF THE HOLY SPIRIT, FOJNICA: VIEW OF THE PRESERVED ARCADES FROM THE OLD CONVENT ON THE GROUND FLOOR OF THE FIRST WING – CURRENTLY MUSEUM'S EXHIBITION

which was initially introduced in 1864. Krešimir Kolovrat, from Bugojno, did the project. The historical arcades from the ground floor, a significant part of the Convent's history, were not lost but instead included and incorporated into the museum. This preservation of the past ensures a sense of historical continuity. Furthermore, the modern design consists of one single wing, oriented with its longitudinal axis in the southeast-northwest direction (Fig. 5). It is attached to the church on the southeastern and northwestern sides of the extension built in 1940. The architecture reveals no noteworthy highlights: a simple rectangular building with a basement, two storeys, and an attic. The basement has a direct approach from the eastern side. The northeastern façade holds ten symmetrically aligned window axes, horizontally divided with cornices marking the floor levels. The matching principle in window disposition and overall decoration was used on the opposite entrance side of the inner courtyard, except for the polygonal bay addition to the ground and second floor. The roof has traditional, gabled construction, hipped towards the northern wing. The outer decoration is reduced to coloured plaster on walls and copper, applied in metal tin sheets on the roof. Lavrenčić's work on the Convent of the Holy Spirit in Fojnica, particularly with the addition of the second wing in 1940, reflects a subtle yet significant engagement with modernity. While the architectural design of the new wing did not overtly embrace the avant-garde movements of modern architecture, it demonstrated a clear departure from the more ornate and historicist styles that characterised earlier phases of the convent's development. Lavrenčić's approach was more restrained and functional, emphasising simplicity and the practical needs of the convent rather than decorative embellishments. The building's orientation and the use of light reflect a thoughtful consideration of the convent's natural surroundings and the need for a harmonious relationship between the old and the new. Overall, Lavrenčić's work can be seen as a balanced response to modern architectural trends, adopting a modernist simplicity that respects the convent's historical context while subtly introducing contemporary ideas about space, functionality, and environmental integration.

The Convent holds a massive collection of different artefacts and pieces of various arts. After the fire in 1664, the library was gradually enriched. Among others, the most valuable books are, for sure, 13 Incunabula[9] and a series of essential volumes of contemporary and old books, magazines, and other documents. The most significant paintings are dated in Baroque time – in the 18th century:

9 Incunabula refer to books, pamphlets, or other printed materials produced in Europe before the year 1501, during the early printing period with movable type. The term, derived from Latin, means "swaddling clothes" or "cradle", symbolizing the infancy of printed literature. These works are highly valuable to historians and collectors as they represent the transition from manuscript culture to print culture. The most famous example of an incunabulum is the Gutenberg Bible, printed around 1455 by Johannes Gutenberg, which is considered one of the earliest major books produced using movable type (Carter, 2004: 86, 130).

10 Franjo Moyses (Franjo Moises), construction master, sometimes mentioned as the architect, originates from Split. Moyses was active in the second half of the 19th century, with notable commissions in OFM Bosna Argentina recorded in Gorica, Livno and in Fojnica (Karamatić, 1991: 73).

11 Josip plemeniti Vancaš was born on 22nd March 1859 in Šopronj (Ödenburg) in the Austro-Hungarian Empire, today located in Hungary, near the Austrian border on Neusiedler See. He was Czech by nationality. He completed elementary school and gymnasium in Zagreb before starting his studies at *Technische Hochschule* in Vienna in 1881 under the mentorship of Professor Heinrich von Ferstel. Between 1882 and 1884, he attended studies at *Akademie der Bildenden Künste*, at the Department for Architecture, with Professor Freidrich Schmidt. Besides Schmidt, Vancaš coworked with famous Viennese architects Ferdinand Fellner and Hermann Helmer during his studies (Krzović, 1989: 253). In 1883, the Government in Bosnia invited Vancaš to Sarajevo and participated in constructing a new Cathedral and Government administration building. Professor Schmidt recommended Vancaš to perform Schmidt's project, but when the authorities realised that Schmidt's project was too expensive, Vancaš was assigned as a chief architect. In the first years of his stay in Sarajevo, which lasted until 1921, he designed mainly Historicisms and then slowly changed the course towards secession and, later on, to the so-called "Bosnian style". Among all the foreign architects who worked in Bosnia, Vancaš left the biggest opus of works and ingenious designs. Overall, Vancaš designed and built more than 240 buildings: 102 houses, 70 churches, 12 institutes and schools, 10 state and municipal buildings, 10 banks, seven palaces, six hotels and coffee shops, six factories, seven interior designs and altars and ten adaptations (Božić, 2006: 36; Božić, 2020: 298; Damjanovic, 2014b: 254-255). Vancaš was very active in social and political life in Sarajevo, founding and supporting numerous foundations, organisations, and events. In 1921, upon his return to Zagreb, he continued in the same manner. In 1929, Vancaš was elected honorary member of the Viennese architectural group Wiener Bauhütte, honourary member of the association *Braća hrvatskog zmaja* (Brothers of the Croatian dragon), and ultimately the corresponding member of the Croatian Academy of Sciences and Arts (HAZU), at the time Yugoslav Academy of Sciences and Arts (JAZU; Božić, 2020: 307).

Vancaš's best profane designs are, besides others, Government Administration Building I (currently The Presidency Building, 1884-1886), Grand Hotel, together with Karel Pařík (1893-1895), Central Post Office (1913), all in Sarajevo and The Grand Hotel Union (1903-1905) and The Municipal Savings Bank (1903-1904), both Ljubljana, Slovenia. Most of his designs were in Sarajevo, but many others were around Bosnia, Herzegovina, Croatia, and Slovenia. Even though his enormous talent and dedication to architecture in all spheres of life led him to outstanding designs of all kinds of projects, sacred architecture was his speciality. Most churches were different parish churches belonging to newly formed dioceses in Bosnia and Herzegovina: Archdiocese of Vrhbosna, Diocese of Banja Luka, and Diocese of Herzegovina.

St. Anne and Mary, *Madonna with Christ*, *The Crucifixion*, *St. George*, *St. Andrew*, etc. Another exciting collection is the *Fojnica coat of arms collection,* including dozens of coats from royal families, countries, noble families, and institutions (Karamatić et al., 1990: 11-13; Oršolić et al., 1984: 19-27).

The Convent Archive, due to the decisive role of the Convent in history, holds a significant number of essential documents, and besides the reprint of the original *Ahidnâme* from 1463, there are other firmans like the one given by Sultân Bayezid-î Velî in 1483, and many other documents, maps, handwritings, etc. (Karamatić, 1991: 58).

It is notable to mention a valuable number of items, once intended for everyday use and sacred events, which are kept in the Museum that operates within the site. Besides the colourful collection linked to common Bosnian and Provincial history, probably the most valuable is the fabric given to Friar Anđeo Zvizdović during the ceremony of the delivery of *Ahidnâme* in 1463 (Oršolić et al., 1984: 19-27).

Parish Church of the Holy Spirit

The history of today's known convent church began just after the occupation crisis in 1878. On 26th August, Bishop Friar Nikola Krilić, Provincial Superior of OFM Bosna Argentina, Friar Bono Milišić, convent's Guardian, along with two other friars from Fojnica, paid a visit to Josef von Philippovich, commanding general of the Austrian troops that invaded Bosnia. Later on, one large delegation of all ethnic groups from Bosnia went to Vienna to meet Franz Joseph I of Austria, Emperor of Austria and Apostolic King of Hungary, to thank him for the liberation of the country; two friars from Fojnica were representing the Bosnian Franciscans. It was all followed by the invitation from Rome in 1880, when two friars from Fojnica were sent there to submit a report on the situation in the country. It was then agreed that the Minister General of the Order of Friars Minor should come to Bosnia. Indeed, it happened in 1882, when Bernardino dal Vago da Portogruaro (Porto Romantino) came to Fojnica and held the General Chapter of the Province. On that occasion, it was decided to construct a new church in Fojnica and new convents in Jajce and Rama-Šćit (Batinić, 1913: 123-6).

At first, friars offered a project to Johann Holz, after which he inspected the site more and proposed constructing the church where it stands now. Due to his serious occupation with other construction sites, he refused the job, and it was later assigned to Franjo Moyses[10], an architect from Dalmatia, who was 30 years before commissioned in Gorica. Shortly after the construction in 1884, the church was demolished owing to the inconsistency and poor quality of the works. Even though everything seemed in order, the walls cracked when the dome was erected, and the construction site was immediately closed. Soon, the Government from Sarajevo sent the architect Josip pl. Vancaš[11] will inspect the site and proceed to take action on further action (Batinić, 1913: 126).

The current church, at the same site, was designed by architect Josip Pl. Vancaš in 1886 (Figs. 6-8). He made significant changes to the original design, opting to demolish most of the previous work. His first step was constructing new retaining walls just below the plateau, followed by the church's construction. By the end of 1889, the majority of the works were completed (Batinić, 1913: 126).

The church, designed in the Renaissance-Revival Style, is a significant example of architectural trends in OFM Bosna Argentina at the turn of the century. In comparison to Vancaš's other projects for convent churches, such as those in Kraljeva Sutjeska, Bistrik, and Plehan (Damjanovic, 2014a), this one stands out for its unique features and is a prime example of the use of revival styles in Bosnian architecture.

The floor plan is cross-shaped, with the central dome at the intersection between the

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Moreover, during the construction of the Cathedral, he was involved in projects for parish churches in Brčko (1884-1885), Brestovsko, Bijeljina, Gradaćac (1886), Modriča (1887) and Žepče (1889). Later, other churches were built according to Vancaš's projects: Tuzla (1893), Domaljevac (1892-1894), Komušina (1893); Gornji Vakuf, Guća Gora, Podhum (1894); Šivša (1895), Kiseljak (1895-1897), Brajkovici (1894-1897), Pećnik (1896-1899), Banbrdo (1899), Vitez (1900), Plehan (1898-1902), Lukavac near Tuzla (1907); Bosanski Brod, Doboj (1909); Zenica (1908-1910), Podmilaćje (1910), Tešanj (1910); Svilaj, Vidovice, Morańcani, Odžak, Olovo (1911); Konjic (1912), Crkvica (1913), Maglaj (1919); Pećnik, Uzdol and Novo Selo (1921); (Božić, 2006: 40). Besides churches, Vancaš was involved in designing numerous convents and parish houses, the most important being the Franciscan convents of OFM Bosna Argentina.

Vancaš had a significant oeuvre outside Bosnia and Herzegovina. Among numerous designs, some should be outlined: in Croatia: parish churches in Krapina (1899-1903) and Desinic (1901-1902), reconstruction of parish church in Oštarije (1901-1902); in Slovenia: parish churches in Bled, combined with Friedrich Schmidt (1900-1905), Prečna (1907-1910), Radeć (1910-1911), and Mirna Peć (1914-1917); (Damjanović 2014b; 252-264).

Regarding ecclesial architecture, Vancaš was intensely devoted to Historicism: Gothic and Romanic revivals, but with tumbling combinations of numerous stylistic elements from other architectural styles. This was because of Vancaš's Viennese education, international contacts, and the Church's decision to direct the architectural guidelines to Western European trends, emphasising and affirming its roots.

Vancaš deceased on 15th December 1932 in Zagreb (Božić, 2020: 277-316).

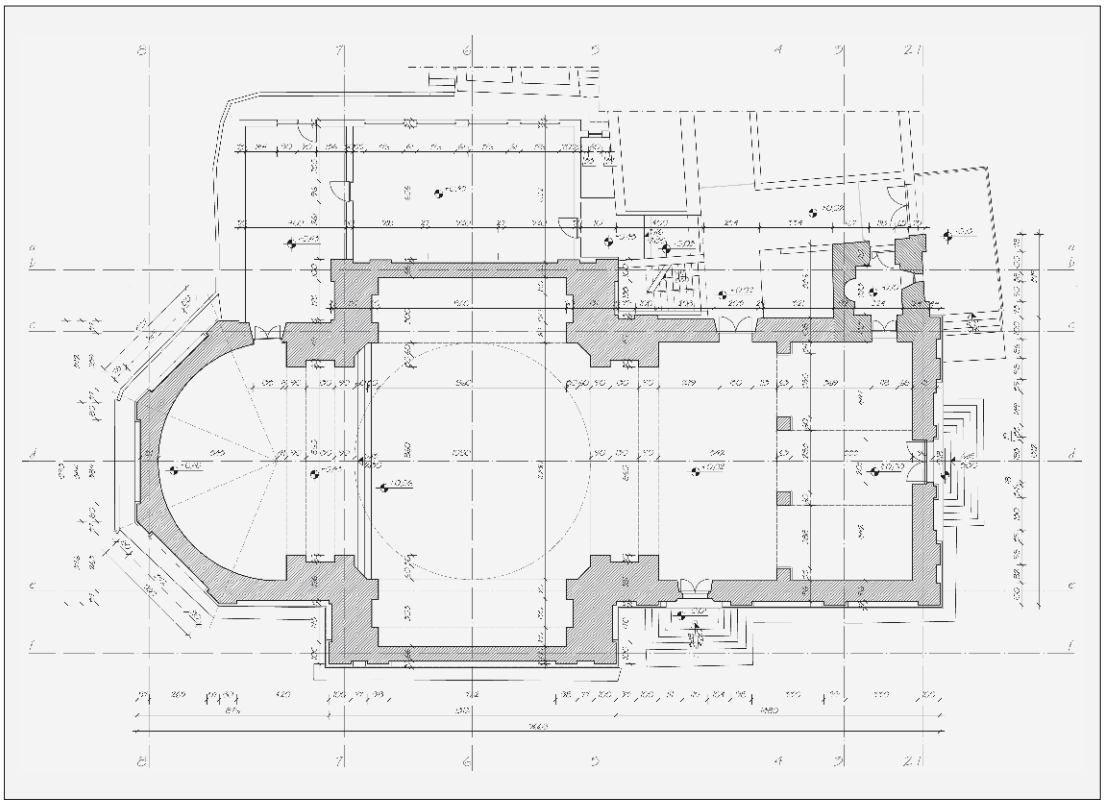

FIG. 6 THE PARISH CHURCH OF THE HOLY SPIRIT, FOJNICA: A PLAN OF THE GROUND FLOOR, SEGMENT OF THE PROJECT OF THE CURRENT CONDITION, DONE AFTER THE ORIGINAL PROJECT BY JOSIP VANCAŠ IN 1886

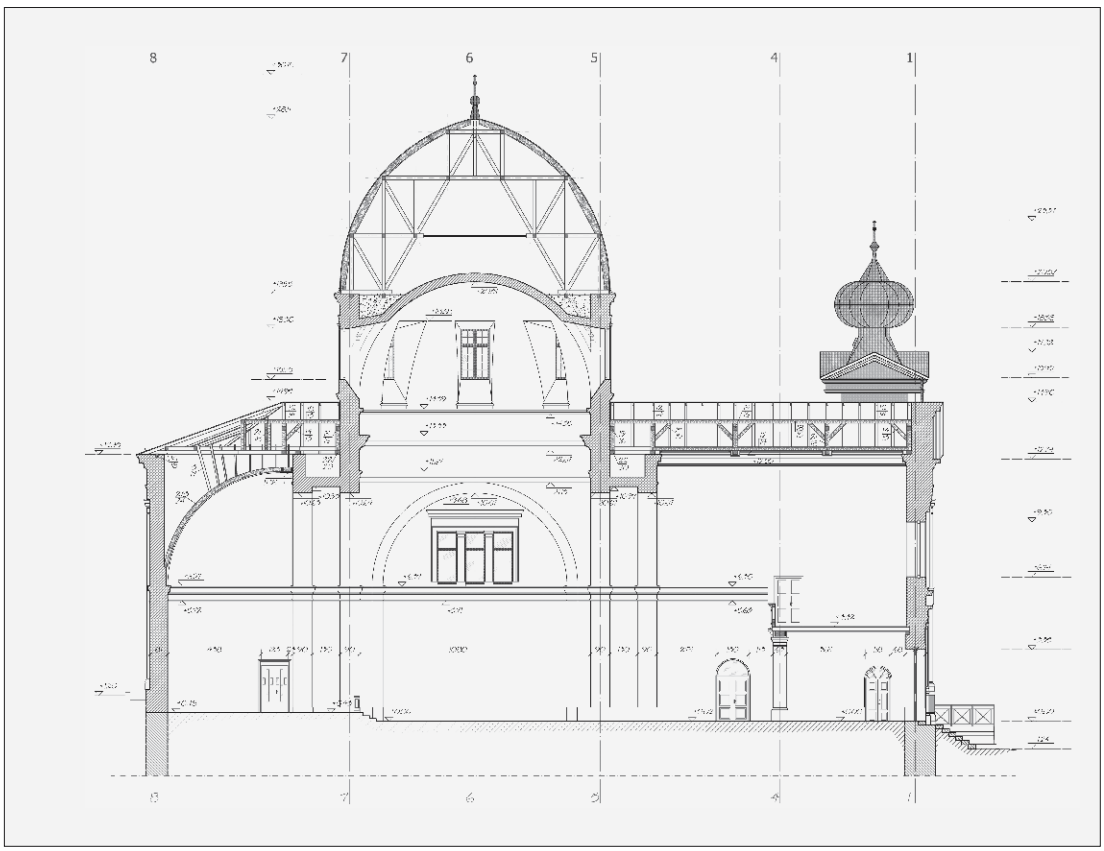

FIG. 7 THE PARISH CHURCH OF THE HOLY SPIRIT, FOJNICA: LONGITUDINAL SECTION VIEW, A SEGMENT OF THE PROJECT OF THE CURRENT CONDITION, DONE AFTER THE ORIGINAL PROJECT BY JOSIP VANCAŠ IN 1886

main nave and transept – making it the only domed convent church in the province. The main entrance is through the narthex, a simple add-on attached to the main axis of the central nave. On the northern side of the narthex, towards the convent wings, there is a bell tower, connecting the church with the first convent's wing.

The core of the structure and inner organisation is the central area: the intersection. Two pairs of pilasters hold the semi-circular arches supporting the upper construction on each of the corners of this square space. Inner pilasters and corresponding arches carry the square tambour, forming the polygonal dome's basis. In contrast, outer pilasters and opposite façade walls form the narthex, transept, and apse. Besides the main entrance from the east, the narthex holds side entrances from the south and north, directly from the convent, while other communications, also from the entrance zone, lead to the bell tower. The narthex is virtually separated from the central nave, with two columns holding the choir platform above it. In the apse, which is semi-circular, there is a connection to the sacristy, located in the later added building part, on the north-western corner between the apse and the transept.

On the second level is the choir mentioned above, which is additionally enlightened with three south-oriented rectangular windows. At the identical height, other windows are located above the east entrance door and on the transept's southern and northern sides. Furthermore, the whole church's structure is at its top, while only the central area rises above the side structure, erecting the polygonal dome structure out of the circular basis. The entire roof structural system is covered with traditional wooden trusses: gabled trusses above the narthex and transept and adapted wooden trusses above the apse, which form the polygonal roof structure – a similar outcome on the central dome.

The addition of the bell tower disturbs the symmetry of the floor plan. Its square foot is directly attached to the northeastern corner of the narthex, bridging the gap between the convent and the church. Its fourth wall above the roof allows it to rise above the church. It has an entirely different dome than the main one: here, the onion-shaped dome sits at the intersection of two small, gabled roofs.

The used materials are stone in lime mortar for the church walls, brick for the bell tower, wooden beams for the horizontal spans of the choir and roof trusses, and sheets of metal tin for roof covers. The walls are plastered and coloured dark yellow or white, depending on the element type on the façade.

Fig. 8 The Parish Church of the Holy Spirit, Fojnica: elevation view from the east, segment of the project of the current condition, done after the original project by Josip Vancaš in 1886

The church's floor is made in two segments: the upper one includes the sanctuary within the apse, and the lower one includes the rest of the church. This is done probably because of two reasons. First, to emphasise the holy place of the sanctuary and discretely raise it above the people, and second, to follow the configuration of the terrain, as it is the place of elevated zone oriented towards the western retaining wall. Those modifications form the basis for the variable height of the stone plinth wall surrounding the church's perimeter in the exterior. The exterior decoration is done following the interior. Each of the façade parts is outlined with pilasters: the polygonal outer wall of the apse holds one pilaster on each of the corners. At the same time, the narthex and transept have two pairs of pilasters, everything virtually supporting the crown cornice. Then, there is a specific break in the plastics so that another, almost the same cornice is put above, and it is the

Fig. 9 The Parish Church of the Holy Spirit, Fojnica: interior view of the central nave, with the main altar and apse in the background

Fig. 10 The Parish Church of the Holy Spirit, Fojnica: interior view of the entrance and the choir level

foot for the tympanums, obviously corresponding to the gabled roofs just behind the gable wall. Transept walls hold rectangular triforas, while the entrance façade above the entrance door has a semi-circular window on the same level. Additional pilasters are distributed along the southern border of the narthex, dividing the space between the sides as mentioned above windows. Rising above the roofs is a subtle transition between the square dome's base and the octagonal dome shape. Each of the eight walls features small pilasters and windows between them.

Surrounded by its pilasters, the bell tower boasts three subtly elongated arched windows on its eastern façade. At the exact height of the turn between the dome foot and the dome, the bell-tower structure changes to the aforementioned intersected roofs, decorated with tympanums and crowned with an onion-shaped dome. All the foreground plastics, meaning the pilasters, cornices, tympanums, etc., are white, while the façade plains are coloured dark yellow.

The inner decoration was done by the Austrian painter Josef Oisner[12] in 1894. It is among the rarest remaining examples of retained "Austrian sacred paintworks" in Bosnia (Batinić, 1913: 126-127; Karamatić et al., 1990: 11-12). Some sources, however, refer to the painter Marko Antonini[13] and his son, Otto.[14] However, as the authors of the work, it remains less likely due to the missing distinctive signature at the entrance, which Marko Antonini typically included in other churches (Oršolić et al., 1984: 8).

12 Josef Oisner, painter, originates from Graz, Steiermark, present-day Austria. Oisner is known for numerous commissions for interior paintworks for churches in Steiermark, most notable is Kalvarienbergkirche Breitwegg in Sankt Ruprecht an der Raab (Bouvier, 1999: 292).

13 Marko Antonini, painter and scenographer, Gemona del Friuli, Italy, 7th September 1849 – Zagreb, 25th May 1937 (Schneider, 1983). He studied painting in Rome. In 1875, in the service of Count A. Nugent, he restored and painted frescoes in Oroslavje and Trsat. In the spirit of academic realism, he painted landscapes, portraits, still lifes, and created frescoes in many churches across Croatia and Bosnia. For the old theatre in St. Mark's Square in Zagreb, he produced around 50 scenic decorations and equipment (Schneider, 1983).

14 Otto Antonini, painter and illustrator, Zagreb, 17th July 1892 – Zagreb, 15th February 1959. Antonini was well-known for his intricate and evocative landscapes, as well as for his illustrations in books and magazines. His paintings often portrayed peaceful and charming scenes of the Italian countryside, skilfully capturing the natural light and atmosphere. His style is characterized by a strong sense of composition and a delicate use of color. Alongside his landscape paintings, Antonini also contributed illustrations to various publications, showcasing his versatility as an artist. His work reflects a fusion of traditional techniques with a subtle modern sensibility, establishing him as a respected figure in the Italian art scene of his time (*** 2023b).

15 "Rieger Orgelbau" was founded in 1845 by Franz Rieger in the town of Jägerndorf (present day Krnov, Czech Republic). It is seated in the Austrian town Schwarzach in Voralberg.

16 The workshop "Ferdinand Stuflesser" originates from Ortisei, Bolzano, South Tyrol, Italy

17 Damiani Suzana, painter. Born in Osijek, Croatia (1965). Damiani holds a bachelor's degree in painting earned at the Academy of Fine Arts, University of Zagreb, and a master's degree from Jan Matejko Academy of Fine Arts in Krakow, specializing in art conservation and restoration. Damiani is a tenured professor at the Academy of Fine Arts, University of Zagreb (*** 2024).

Even though it is one of the smallest convent churches in the OFM Bosna Argentina, besides the convent churches in Visoko and Nedžarići, the inner decoration was brought to an equally high level as the general architecture. As told, Oisner did beautiful paintwork, separating the internal space into two ensembles: the lower one, corresponding to the total height of the choir with the railing, and the upper one, including all the rest above. The lower zone is superficial, painted in beige and crowned with a substantial cornice following the total inner perimeter. The contrast to the plain colour is made with hanging paintings, altars, and other furnishings, which accent it even more. The more prominent is, for sure, the sanctuary, where a heavily decorated altar is brought to the foreground. The zones above are also richly decorated with floral motives and adequate displays of the saints. On all arches, separating the central space from the surrounding zones, there are inspiring Christian inscriptions – something that can be found in most of Vancaš's churches.

As described previously, the old church, built in the late 17th century, was equipped with the organ installed in 1801 – and it was the first organ in Bosnia. Unfortunately, the organ was also not preserved when the old church was demolished. However, the new church was equipped with a new organ built by "Rieger Orgelbau"[15] 1896 (Stanušić, 2005: 6). In 1894, the workshop "Ferdinand Stuflesser"[16] furnished the interior with three altars. Afterwards, the church was equipped with Via Crucis made in Vienna and two bells made in Innsbruck (Batinić, 1913: 126-127; Karamatić, 1991: 58). Currently, the church holds three bells: big and small – cast in Livarna Zvonov in Maribor in 1927, and the middle one cast in Ljubljana in 1894 by Albert Samassa.

On 15th August 1895, Dr. Josip Stadler, Archbishop of the Archdiocese of Vrhbosna, consecrated the church (Batinić, 1913: 128). The church was repaired in 1913 and finalised by laying ceramic tiles on the floor and furnishing the rest of the interior (Batinić, 1913: 128).

The façades and the interior were restored from 2010 to 2014. The paintwork and furnishings restorations works were done under the leadership of Prof. Suzana Damiani[17] from the Academy of Arts University of Zagreb (Figs. 9 and 10), while construction works were executed by „DM Projekt Mostar"[18] from Mostar.

Contemporary or Obsolete?

A common topic of debate is whether architecture in Ottoman and post-Ottoman Bosnia and Herzegovina was contemporary or already outdated. The Franciscan complex in Fojnica, with its three construction stages belonging to different eras and a few other sites in the country, often serve as evidence of contemporary architectural influence. The development of primarily religious buildings and some communal and public structures during the Ottoman period did not align with Western European architectural trends, flourishing just a few hundred kilometres from medieval Bosnia. This disparity is evident in the sudden halt of architectural evolution seen in the preserved remnants of constructions like the late 15th century tower of Saint Luke adjacent to the Franciscan church and the convent of Saint Mary in Jajce, which exhibit Romanesque and Gothic elements. Similar characteristics are observed in the earliest preserved architecture at Fojnica, such as the stone arches on the ground floor of the first convent wing.

The advent of Austro-Hungarian rule in 1878 marked a significant shift. A wave of engineers, educated in imperial schools in Vienna, Graz, Prague, and Brno, began establishing private practices or engaging in public projects under the *Landesregierung* in Sarajevo. During this period, the Austro-Hungarian administration, still grappling with the onset of the Industrial Revolution and the move away from historic styles, promoted historic revival styles that were prominent in Vienna, Budapest, and Graz. This influence heavily shaped the architectural identity of Bosnia and Herzegovina at the turn of the century.

The architectural language of the church in Fojnica is a notable example of a transition to contemporary styles and influences, moving away from Ottoman traditions to embrace Western aesthetics. Vancaš's use of the Renaissance-Revival style reflects broader European trends permeating Bosnia during the Austro-Hungarian period. The church's cross-shaped floor plan, central dome, and fusion of Renaissance features with local architectural traditions indicate a deliberate effort to engage with contemporary architectural movements while addressing the Franciscan community's specific religious and cultural needs in Bosnia.

The continual rebuilding and adaptation of the convent over the centuries, particularly following the challenging Ottoman era, highlight the dynamic nature of its architecture, evolving in response to external influences and the practical needs of the Franciscan fri-

18 "DM Projekt Mostar doo" is a construction company from Mostar notable for commissions on various cultural heritage buildings, foremostly in southern Bosnia and Herzegovina. The company ceased to exist in 2023.

ars. Although the medieval elements were often reconstructed, they retained their original features, reflecting the contemporary heritage of their respective periods. The most recent addition to the convent exemplifies adherence to the principles of the Modern movement, which was already sweeping across Europe and influencing regional centres like Belgrade, Zagreb, and Sarajevo. Architect Lavrenčić, a proven Modernist, incorporated a design characterised by clean lines, minimal ornamentation, and straightforward material usage, epitomising modern architectural ideals favouring functionality. This contemporary approach is evident in how the new wing integrates with the existing structures, achieving visual and functional coherence without overshadowing the convent's historical components.

In conclusion, the architectural ensemble at Fojnica stands as a testament to its historical context and contemporary architectural expression of the times. Its unique value lies in the seamless integration of layers from different eras, demonstrating a continual adaptation to contemporary movements while preserving the essence of its historical significance.

CONCLUSION

The Franciscan site in Fojnica undoubtedly represents one of the most significant sites for Catholics from western and central Bosnia, and beyond – with its decisive influence on the historical streams of both OFM Bosna Argentina and Bosnia and Herzegovina. From its humble beginnings in the late 13th century to the pivotal negotiations of Friar Anđeo Zvizdović with Sultan Mehmed II in 1463, the site has weathered wars, fires, and cultural transformations, emerging each time as a beacon of hope and continuity for the Catholic community in the region. The architectural journey of the convent and church, spanning from medieval origins through Ottoman and Austro-Hungarian periods to contemporary renovations, reflects changes in building styles and the adaptive spirit of the Franciscan friars who safeguarded this spiritual and cultural sanctuary.

From an architectural point of view, with its unique position in the valley, rising prominently above the town and dominating the landscape, the Convent and the Parish Church of the Holy Spirit stand as representative landmarks. Not only is architecture from the mid-1860s preserved, but later additions – foremostly the church, introduced original novelties to the province's architectural heritage range. The church designed by Josip Vancaś highlights the architectural values, being one of the most prominent churches built by this architect throughout his prosperous career in Bosnia and Croatia.

Today, the Convent of the Holy Spirit and its accompanying Parish Church, with their rich collections of art, manuscripts, and historical artefacts, continue to inspire reverence and scholarly inquiry. They stand not just as physical structures but as living testaments to the enduring role of faith in shaping Bosnia and Herzegovina's cultural mosaic.

In conclusion, the Convent and Parish Church of the Holy Spirit in Fojnica are more than mere buildings; they are symbols of spiritual resilience, cultural continuity, and the timeless pursuit of religious freedom and artistic expression. Ensemble in Fojnica remains influential in shaping the architectural landscape of the region, making them enduring icons of the intersection between tradition and modernity in Bosnian religious architecture.

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Fig. 2	Rudolf, 1901: 244
Figs. 6-8	*** 2010

Author's biography

Miroslav Malinović, Ph.D. (1988), architect and associate professor. His research focuses on the history of architecture in Bosnia and Herzegovina, particularly the period from the late 19th century onwards. He serves as the Head of the Chair for History and Theory of Architecture and Building Heritage Protection. He was appointed Vice-Rector for Science, Research, and Development at the University of Banja Luka (2022-2023).

Fig. 1 View of the town of Ploče, area of Lower Ploče

Jasenka Kranjčević[1], Zrinka Barišić Marenić[2], Duje Jelčić[3]

[1] Institute for Tourism, Vrhovec 5, 10000 Zagreb, Croatia
https://orcid.org/0000-0002-5594-9868
[2] University of Zagreb Faculty of Architecture, Fra Andrije Kačića Miošića 26, 10000 Zagreb, Croatia
https://orcid.org/0000-0002-8574-7220
[3] University of Zagreb Faculty of Architecture, Fra Andrije Kačića Miošića 26, 10000 Zagreb, Croatia
https://orcid.org/0009-0008-1088-0351

jasenka.kranjcevic@iztzg.hr
zbarisic@arhitekt.hr
djelcic@arhitekt.hr

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Urban Genesis of a Modern Port-Industrial Town on the Adriatic from 1945 to 1990 – Ploče, Croatia

Adriatic
Ploče, Croatia
port-industrial town
urban genesis

Based on the urban planning historical and comparative method, the paper gives a concise overview of the urban genesis of Ploče, a new port-industrial town, built in the 1945-1990 period. As the youngest town on the Croatian part of the Adriatic coast, it developed after the demanding and extensive works on the regulation of the Neretva River and the construction of the Sarajevo-Ploče railway line to meet the needs of the port. Within the framework of social planning and on the basis of urban development plans, which involved mostly Croatian urban planners, a new town was soon built on a previously undeveloped rocky and swampy area. 80 years after the idea of a new town, the urban planning of Ploče undoubtedly represents the urban heritage of Modernism. The specific spatial identity can be presented for the needs of tourism and used for sustainable development planning.

Introduction

In the long fact-oriented urban planning documents on urban settlements on the Croatian territory planned for more than 25 centuries[1] (Obad Šćitaroci, Bojanić Obad Šćitaroci, 2018; Karač, 2020: 217), there are still some cities whose urban genesis has not been sufficiently researched. That is why they have not been regarded as heritage and placed in the function of sustainable development.[2]

Cities which were planned and built in a relatively short time and were a result of strategic objectives are not a novelty on the Croatian territory and can be found throughout the history of urban development. The reasons of their creation may be a result of one or more factors (political-military or political-economic factors, transport or health tourism factors, religious factors, etc.). For example, Greek colonies on the Croatian side of the Adriatic founded new towns such as Vis (Issa), Stari Grad on Hvar (Pharos), etc. Pag and Ston were created later as planned towns. Karlovac (1579), Osijek (1712), Slavonski Brod (1715), Nova Gradiška (1748), Bjelovar (1756), Pula (1856), etc. were founded as military cities. Kaptol and Đakovo were founded for religious purposes. In the late 19th and early 20th century, the Croatian territory went through numerous modernisation processes and cities were founded for industry purposes. Among them are Đurđenovac (1866), Belišće (1884), Duga Resa (1884), San Pietro / Uble on the island of Lastovo (1931-1936), Bata ville / Borovo near Vukovar (1931-1938), Mandre on the island of Pag (1936-1941), Raša (1936/1937), Pozzo Littorio / Podlabin (1940-1942). Lipik (1867) and Opatija (1882) were founded as health resorts. There were also planned reconstructions, such as the one after the Dubrovnik earthquake in 1667, marked by a new spatial structure (Karač, 2020). The urban genesis of the said towns has been more or less researched, and some of it has been recognized as valuable urban or architectural heritage and presented partially or more fully for the needs of tourism and/or sustainable development.

The planned construction of new settlements was not completed even after World War II, when Croatia was part of the socialist Yugoslavia. New cities were founded in each of the republics[3], including Croatia. For the purposes of the military industry, a new town, Lički Osik, was planned and founded (Kranjčević and Božić, 2012, 2014), as was Ploče, which served as an Adriatic port (Fig. 1).

The issue of urban planning and technical-technological experiments in the urban planning and architecture of socialist Yugoslavia is still a very current topic that is also being researched abroad, as shown by the large exhibition on Yugoslav architecture (Toward a Concrete Utopia: Architecture in Yugoslavia 1948-1980) held in early 2019 at the prestigious New York Museum of Modern Art. The great interest of international experts and visitors only indicates that the urban and architectural heritage in which Croatia occupies an important place is still insufficiently researched and presented.

The aim of this paper is to research the urban genesis of Ploče as the youngest planned port-industrial town on the Croatian part of the Adriatic in the context of the 1945-1990 regional and urban planning, and to determine whether the urban genesis represents heritage, what valuable characteristics it has and whether it can win recognition and support development. Several methods were used to research the urban genesis of Ploče,

1 A scientific project entitled Heritage Urbanism, funded by the Croatian Science Foundation, was carried out at the Faculty of Architecture of the University of Zagreb 2014-2018, in which models of urban revitalisation were considered. The need for this type of research was indicated in the 1988 preface to Lewis Mumford's book The City in History, in which he stated that he was unfamiliar with the urbanism of the cities of Eastern European countries

2 European Union, Cities and regions driving high-quality architecture 2023, https://data.europa.eu/doi/10.2766/833321. Accessed on 29/06/2024.

3 Velenje (Titovo Velenje) and Kidričevo near Ptuj are the new cities founded in Slovenia. Novi Travnik

such as the urban planning historical and comparative method (to explain the construction of the port by providing the regional context and comparison with other cities) and the analytical method (for the analysis of the physical planning documentation, partially preserved in various institutions). The inductive-deductive method was used to form a conclusion in order to determine the urban genesis as heritage and to valorise it.

The research on the urban genesis of Ploče had certain limitations as there was no access to the spatial planning documentation, which was either lost or destroyed and which would have been used to gain a more complete insight into the creation of the town. Different names (now outdated) used for same-level urban development plans (e.g. directive basis, regulation plan) also represented a challenge. In addition, the archives of the Urban Planning Institute of the Socialist Republic of Croatia, which are located in the State Archives in Zagreb, have not been preserved in their entirety. The part missing is the one that refers to the period immediately after World War II. Another limitation is the fact that the Town of Ploče changed the scope of the town and the regional context due to the changes in socio-political and economic circumstances in the 1990s. Ploče often changed its name; during the Austro-Hungarian Monarchy it was called Porto Tolero ("transshipment port" in Italian), in the Kingdom of Yugoslavia up to World War II its name was Aleksandrovo (after King Alexander I Karađorđević), and during the 1943-1945 Italian occupation its name was changed back to Porto Tolero. During socialist Yugoslavia, its name was again changed several times; it was called Ploče 1945-1950, then Kardeljevo 1950-1954, Ploče 1954-1980, and Kardeljevo again 1980-1990. In 1990, its name was once again changed to Ploče, and has been in use ever since (Kovačević, 1996).

Literature Review

The urban genesis of the youngest town on the Croatian part of the Adriatic has surprisingly remained overlooked by both national and international researchers. As a result, there is a notable absence of papers that are at least tangentially related to its urban development. The first ideas on why the contemporary port of Ploče (Porto Tolero) should be built and its connection with the railway can be found in Austro-Hungarian magazines after the 1878 occupation of Bosnia and Herzegovina. The variants of the routes of the new railway line and the connection with the port can be read about in different publications from 1878 to 1973 (*** 1878a; *** 1878b; Žežula, 1898; *** 1905; *** 1911; *** 1912/1913; Wessely, 1973).[4] The plans and the projects needed good-quality geodetic bases, so the delta/mouth of the Neretva River was surveyed during the second military measurement (1865-1896).[5] In Croatia, the most important papers on the regulation of Neretva are the papers by Szavits-Nossan from 1939 and Vujasinović from 2008, which reveal information regarding demanding construction and reclamation works (Szavits-Nossan, 1939a, 1939b; Vujasinović, 2008). Geographer Curić's work mostly focused on the transformation of the seaside towns and villages under the influence of tourism of the Lower Neretva, including Ploče. Through his longitudinal research, he offered a review of the tourist traffic and the most important information on the natural and cultural heritage (Curić, 1989, 1994). As a passionate collector of the documentation on Ploče, Ante Kovačević published various books on specific topics, including the development of the school system and the heritage of the surrounding towns, which also offered other information on Ploče (Kovačević, 1989, 1992, 1994, 1996, 2003, 2004); however, he did not cover the urban genesis of the new town. The most important papers regarding the port of Ploče and its regional context are papers by Jelinović from 1957, Dobrinčić from 1959, Žuljić from 1978, Kojić from 1983 and Smoljan from 1996. Ivo Orešković pointed out the importance of the archival documentation of Ploče as an important source for various kinds of research, even though he created an inventory list of the remaining documentation of the Ploče archives (Orešković, 2020, 2022). Numerous civil engineers from Croatia participated in complex projects on the regulation of the Neretva, whose realization contributed to the improvement of the working and living conditions of the local population, such as Ante Celegin, Frana Hekman, Dinko Volarić, Vjekoslav Vlašić, Branko Pejaković, Tomislav Ramljak and others (Martinović, 2011). The potentials of the construction heritage of the rural areas of the Neretva Valley and the guidelines for their revitalisation

(formerly Pucarevo) and a large expansion of the pre-war industrial city of Vogošće near Sarajevo were built in Bosnia and Herzegovina.

4 A discussion on the economic justification is noticeable in the listed publications, as is a discussion on the selection of the best quality solutions for the river regulation route and the railway line for the construction of the port.

5 Given that the regulation of the river, the construction of the railway line, the port and the city itself were capital investments, they took several decades to be realised. Despite the economic justification, the investments were halted with the two world wars.

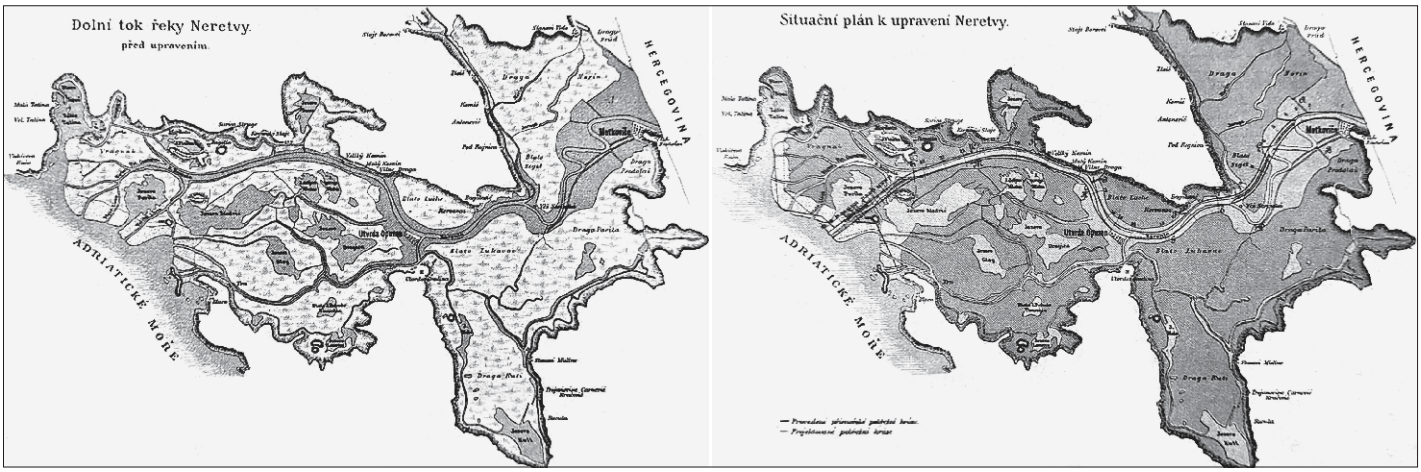

FIG. 2 THE NERETVA BEFORE (LEFT) AND AFTER REGULATION (RIGHT)

were considered during the European project CO-EVOLVE (APE, 2019).

The starting points of the urban genesis of Ploče is an article published in 1955 in the magazine Arhitektura (*** 1955) and two books by the Urban Planning Institute of Croatia which contain an exhaustive list of physical plans which were made for Ploče but have not been found (Urban Planning Institute of the Socialist Republic of Croatia, 1987; Urban Planning Institute of Croatia, 1997).

ASSUMPTIONS AND CONDITIONS FOR THE CONSTRUCTION OF THE PORT AND ITS REGIONAL CONTEXT

Throughout history, the location of the settlements on the Neretva River delta was conditioned by various factors (geographical, political, economic, social, and cultural). Most often they were founded on the borders of fertile valleys. With the development of technology, certain settlements were founded along routes (waterways, roads, and railways). Those on the crossroads of various routes, such as Metković, obtained a larger role and importance.

With systematic and long-term regulation of the Neretva, its navigable route had been increasingly exploited, and the idea of building a port at the river's mouth into the sea developed. Simultaneously with the construction of the port, the idea of building a new town was being considered. The new city would become one of the centres of this area and bring significant changes to the region that previously had predominantly rural characteristics (Urban Planning Institute of Dalmatia, 1973; Curić, 1989, 1994).

Although the Neretva regulation plans date back to the beginning of the 17th century, they mostly deal with the navigability and the flood defence system. In the late 19th and early 20th century, the Austro-Hungarian Monarchy was exploring the possibility of economic development of its southern parts (Dalmatia and Bosnia and Herzegovina) through the development of industry. However, various prerequisites needed to be fulfilled, which included those related to transport. The projects were interrupted by World War I. With the completion of the regulation of the Neretva in its lowest reaches, as well as with the construction of the railway line and the road to Ploče, the prerequisites for the planning of the new town were fulfilled. In addition to the regulation works, reclamation works were also carried out because they reduced the negative consequences of floods and therefore of malaria (Dobrinčić, 1959: 68; Smoljan, 1988, 1996; Vujasinović, 2008; Fig. 2).

In 1936, between the two world wars, architect Boris Karakoz drew up the projects for the construction of the harbour operational coast in the bay of Ploče and the railway line to Ploče because Metković (20 km from the mouth of the Neretva) did not meet the conditions for a port town (Kojić, 1983; Curić, 1994; Kovačević, 1994; Smoljan, 1996). The construction of a narrow-gauge railway line from Metković to Ploče started in 1937. In 1942, during World War II, the Metković-Ploče narrow-gauge railway line was put into operation, and it was modernised in 1966 with the Sarajevo-Ploče broad gauge (Kovačević, 1996: 48-49). The port was serving the whole hinterland, an area in Bosnia and Herzegovina and the eastern part of northern Croatia, as

6 The Vladimir Gortan railway construction company from Croatia carried out the works on one part of the route through Bosnia and Herzegovina between the stops Gornji Grad and Čelebica, as well as the construction of the railway junction in Konjic.

well as a part of Vojvodina and Serbia (Dobrinčić, 1959; Fig. 3). All this indicates that the building of Ploče should be viewed in a regional context (Vresk, 1990). With the development of the regional planning methodology, i.e. the coordination of different sectors (transport, physical planning, tourism, etc.) and after World War II, Ploče was viewed in a regional context. The works on the modernisation of the railway from Sarajevo to Ploče were done in early 1960s[6] (Kukić, 1963; Staklarević and Štefanac, 2015). Construction was also focused on the building of the Adriatic road which was the greatest investment in Croatia at the time (Jančiković, 1965). Investment in the transport infrastructure and the port resulted in a sharp increase in freight transport and made Ploče one of the most important ports in the Socialist Federal Republic of Yugoslavia, right after the port of Rijeka and more important than Split and Koper (Kojić, 1983: 121).

The regional significance of Ploče was supported by the Regional Physical Plan of the Southern Adriatic (Regionalni prostorni plan Južnog Jadrana – RPPJJ; UN and Government of Socialist Federal Republic of Yugoslavia, 1968; Zeković, 1971; Vušović, 1971; Kostić, 1971). In that plan, the Neretva Valley was considered as one of the six subregions with the Sarajevo-Metković-Ploče centre. Due to the rapid economic development and population migration, towns and villages on the Neretva delta demonstrated a strong growth, and the 1968 RPPJJ planned that around 25,000 inhabitants would live on the territory of the then Municipality of Ploče in 2000. The development guidelines set out by the RPPJJ were taken into consideration in the next generation of state-level physical plans made in 1974 and 1989 (Republican Secretariat for Urban Planning, Construction, Housing and Communal Affairs of the Socialist Republic of Croatia, 1974; Republican Committee for Construction, Housing and Communal Affairs and Protection of the Human Environment, 1989), as well as in lower-level plans, such as the Master Plan of Ploče and the Physical Plan of the Municipality of Ploče (Urban Planning Institute of Dalmatia, 1973, 1982). The littoralisation, urbanisation and industrialisation processes resulted in the settlement of young and active population in the area. In just over 40 years, the population in Ploče increased by around 8.6 times (Table I).

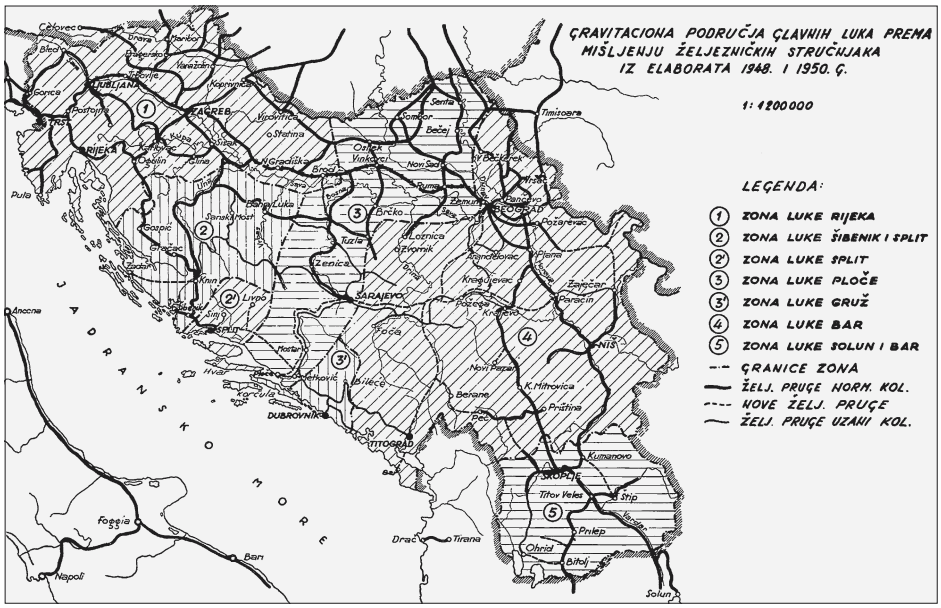

Fig. 3 Gravitational area of the ports of socialist Yugoslavia

Table I Population Flow in the Town of Ploče 1948-1991

Year	1948	1953	1961	1971	1981	1991
Number of inhabitants	727	1,657	3,102	4,405	5,318	6,324

Note: In 1948 and 1953 the town was listed under the name Kardeljevo, in 1961 and 1971 under the name Ploče, and in 1981 once again under the name Kardeljevo. In 1991, the Ploče area was reduced by removing a part of the villages which became part of the Peračko Blato area. Source: Croatian Bureau of Statistics, Settlements and population of the Republic of Croatia 1857-2001. https://web.dzs.hr/Hrv/DBHomepages/Naselja%20i%20stanovnistvo%20Republike%20Hrvatske/Naselja%20i%20stanovnistvo%20Republike%20Hrvatske.htm. Accessed on 28/06/2024.

Urban Genesis of the New Town

Geographically, Ploče is situated 43002´N and 17026´E, in a well-protected natural bay of the Neretva delta. The harbour is approached through a 100m-wide canal at Cape Bada or a 150 m-wide canal at Cape Višnjica. The depth of the harbour is 11.5 m.

On 15 July 1945, the Regional People's Liberation Committee for Dalmatia in Split reached a Decision on the Construction of the Town and the Port, which resulted in its fast planning and the construction of the new town (Kojić, 1983).[7] During the process of designing the town, two concepts were considered; the linear and the homogeneous type of a town. Having taken into consideration its relief, routes of roads and waterways, as well as other limiting factors, the idea of a linear town was abandoned and the concept of a homogeneous town was chosen because of the natural ambience and functional connectivity of the town located on the southwestern slopes of Stražnica hill, which has a slight amphitheatre shape (Urban Planning Institute of Dalmacije, 1973). In order for the town to function, it was necessary to build electri-

7 Although the narrow-gauge railway line to the port was destroyed in several places during the war, in October 1945 it was reconstructed, and the reconstruction of the coastline was started to allow the arrival of cargo for the steelworks in Zenica (Bosnia and Herzegovina).

TABLE II OVERVIEW OF THE PHYSICAL PLANNING DOCUMENTATION OF PLOČE 1945-1991

Year	Name of physical planning documentation	Responsible planner / Source
1947-1948	Detailed Regulatory Plan of the Port and Town of Ploče	Tankred Lubinsky / *, **, ******
1949-1952	Conceptual Urban Design of the Settlement (Prišnica), Ploče	Tankred Lubinsky / **
1954	Historical-Urban Development Kardeljevo, studies – research	– / *
1954	Conceptual Study of the Master Plan of the New Town	Branko Vasiljević; Branko Petrović; Miroslav Kollenz; model: Hasan Zukanović; photo: Zvonimir Barbaric / *******
1954	Regulatory Basis for the New Town Ploče Port	Branko Vasiljević and Branko Petrović / *******
1954	Conceptual Design of the Town Center with a Horticultural Solution for the Area and Space Around the Pier	– / **
1957	Urban Development Plan of the New Town	– / **
1960	Directive Urban Development Plan of Ploče I	– / ***, ***** Box 6/26
1960	Directive Urban Development Plan of the Town of Ploče II	– / Projekt Zagreb / ***, ***** Box 7/27
1960	Urban Design V. and M. Milosavac (Residential Neighbourhood)	Projekt Zagreb / ***
1963	Detailed Urban Development Plan	– / ***** Box 16/46
1964	Detailed Urban Development Plan of Ploče	– / ***** Box 11/29
1964	Regional Physical Plan of the Drvenik – Gradac Coastal Strip and the Bacinska jezera Area	– / *, ***
1967	Decision Replacing the Regional Coastal Area Plan of the Municipality of Metković	– / *, ***
1967	Ploče – Velike Bare Residential Neighbourhood	– / ****
1967	Projects – Prišnica-Stražnica	– / ***
1967	Projects Mali Milosavac	– / ***
1968	Conceptual Design of the Gradina Center and Settlement	– / **
1970	Urban Design Project – Analysis of the Wider Area	– / **
1971	Urban Design Project	– / **
1973	Master Plan of Ploče	Berislav Kalogjera, Srđan Truta / ***, ****
1980	Detailed Urban Development Plan for the Laguna – Jadran Tourist Resort on the Neretva mouth	HR-HDA-2039 Urban Planning Institute of Croatia, Box 720
1982	Physical Plan of the Municipality of Kardeljevo until 2000 – Final report	***, ****
1987	Amendment of the Physical Plan of Kardeljevo	Boris Fantella / ****
1987	Amendment of the Master Plan of Kardeljevo	Boris Fantella / HR-HDA-2039 Urban Planning Institute of Croatia, Box 716 ****,
1987	Spatial possibilities	Srđan Truta / Urban bureau of Split, URBS 1947-1967, 20 godina urbanističke organizacije [20 Years of Urban Organisation], Split, 1967
1987	Spatial Location of Kardeljevo as a Transport, Production, and Distribution Hub in the Central Adriatic	– / Urban bureau of Split, URBS 1947-1967, 20 godina urbanističke organizacije [20 Years of Urban Organisation], Split, 1967
1987	Detailed Urban Development Plan of Stražnice – Mali Milosavac	Germano Mitrovic / ***** Box 51/114; URBS 1967
1987	Detailed Urban Development Plan of Brist for Slakovac	– / *****, Project, Box 187/353

Processed by authors. Sources: * Urban planning institute of the Socialist Republic of Croatia, monograph, 1987; ** Urban planning institute, 1997; *** Urban planning institute of Dalmatia, 1973; **** Matošic, 2012; ***** The town of Ploče, Archives; ****** Milas, 2011; ******* The Official Gazette (Narodne novine – NN), 1955

cal, water, sewage and telephone networks and introduce a waste collection system.[8]

The town is divided by the Crna Rijeka, a sidearm of the Neretva. To the south of the Crna Rijeka are the port and Prišnica, or lower Ploče, to the north Stražnica, and to the northwest the Milosavac peninsula, or upper Ploče.

The construction of the new town can be divided into two basic spatial areas, although they are interconnected in various ways: the port (later also industrial complexes) and the town. The port is located in the southern part of the town and in the flat part of the Neretva delta and occupies the largest area of the town. Adjacent to it, there are complexes which are in the function of the port and serve for storage, as well as industrial complexes. Massive cranes dominate the view of Ploče. In the northern part of that area, a ferry pier from which now operates the ferry line Ploče-Trpanj on the Pelješac peninsula was built. South of it is the current terminal of the Port of Ploče and the Port Authority. The expansion of the port, as an incentive for the creation of the new town, has not been realised to date, although the project for it was made back in 1966 (Smoljan, 1966: 169).

In the first decade after World War II, various kinds of plans were drafted for the new town (Table II) because the situation on the ground required certain changes during construction (Figs. 3-5). For example, the sports and recreation area originally planned east of Prišnica was realised on a regulated swampy area – then called Bara (Pond). The streets of the new town were laid out on the southern slopes of Stražnica following isohypses that are connected to each other by public pedestrian stairs. Although the plans included public and social buildings and buildings for sports and recreation, the construction of residential buildings was prioritised. The pace of the construction of the new town can be seen from comparative aerial photographs of the State Geodetic Administration taken in 1960, 1966, and 1968 (Figs. 6-8).

Few physical planning documents have been saved, namely those from the 1970s and 1980s. Those plans and the publication of the Urban Planning Institute provide insights into the process of the preparation of the physical planning documentation presented in Table II. Projektno poduzeće Projekt from Zagreb was hired, along with the Urban Planning Institute which drew up plans for the town, for planning and designing the port and providing knowledge of the technical and technological process. During the 1970s, the Urban Planning Institute of Dalmatia was hired to draw up plans (Urban Development Bureau of Split, 1967; Urban Planning Institute of Dalmatia, 1973; Matošić, 2012).

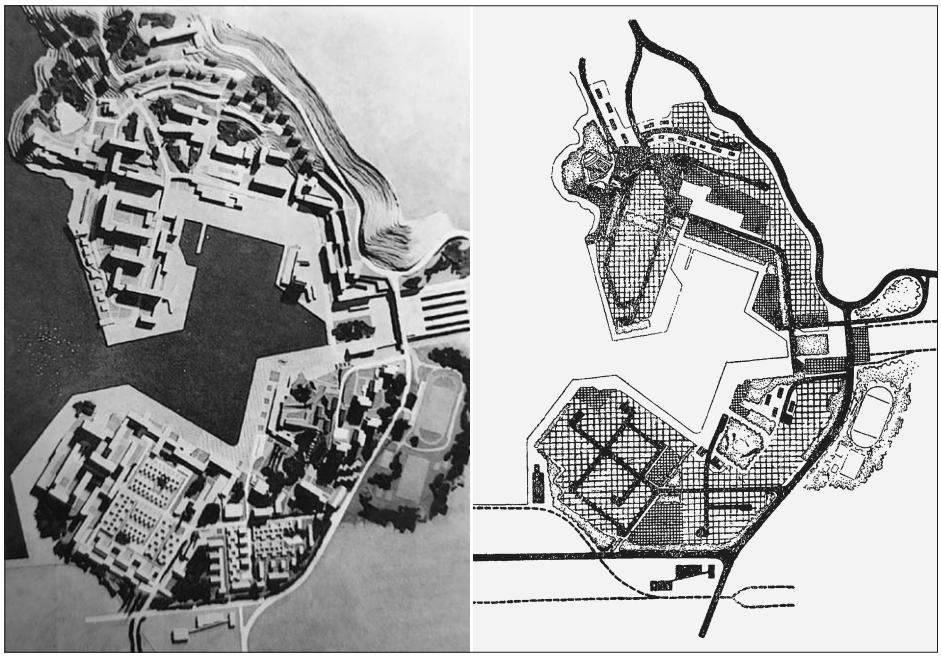

Fig. 4 Photograph of the model of Ploče (left) and the first known town schema (right), 1954

Fig. 5 Comparative arial photographs, orthophoto, Ploče, 1954 (left) and 1960 (right)

8 The water supply network uses water from the Klokun source (minimum capacity: 150 l/s), and until 2000 its capacity met the needs of the growing population. In the event of the construction of new industrial plants, new water extraction locations would need to be explored. Electricity is supplied from the Opuzen electricity substation. The cemetery was planned along the Adriatic road, next to the small church of St George, and the landfill is located west of Ploče. See the Urban Planning Institute of Dalmatia, 1973: 138-140.

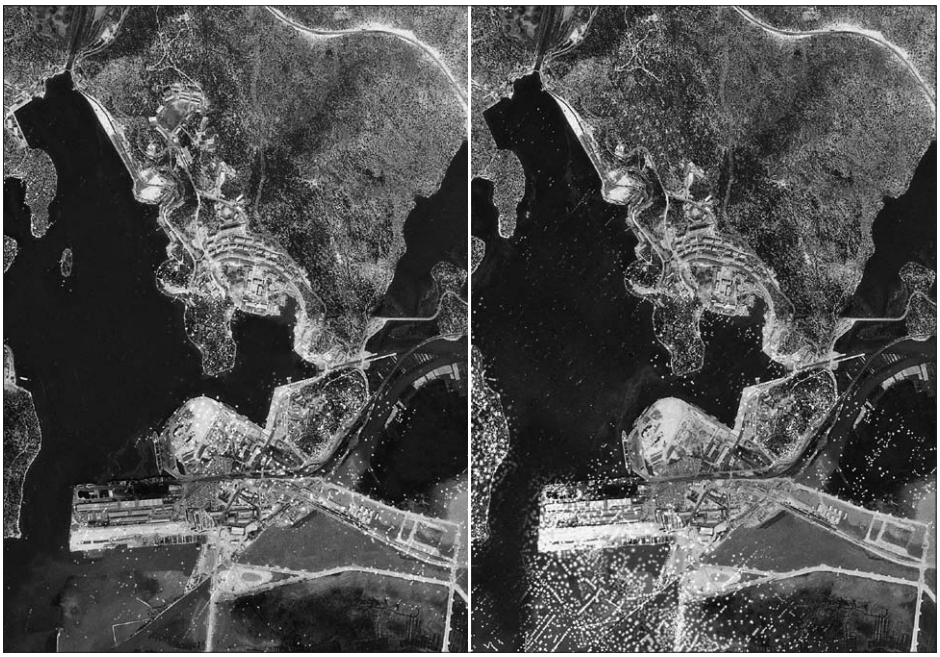

Fig. 6 Comparative arial photograph, orthophoto, Ploče 1966 (left) and 1968 (right)

According to architect Dinko Milas, the first concept of the town is associated with Tankred Lubinski from the Urban Planning Institute from Zagreb. He was the son of the prominent architect Rudolf Lubinski (Milas, 2011). In mid-1950s, architects Branko Petrović, Branko Vasiljević and Miroslav Kollenz, who were also employed at the Urban Planning Institute, worked on the urban development plans (*** 1955). With the strengthening of the Urban Planning Institute of Dalmatia, located in Split, the drafting of the new generation of physical planning documentation was entrusted to architects Srđan Truta, Berislav Kalogjera, Boris Fantella and Germano Mitrović from Split (Urban Planning Institute of Dalmatia, 1973; Matošić, 2012). "Srbija projekti" from Belgrade worked on the detailed urban development plans.

Fig. 7 Photograph of Upper Ploče (northern part)

Due to the change in the character of Ploče and other towns and villages in the Neretva Valley in the late 1960s, further expansion of the town was planned. There was some consideration of a conurbation that never materialised. The first residential stone buildings in Ploče were built on Prišnica hill in 1947, south and above the Neretva side-arm, also known as the Crna Rijeka. In the northern part of the town, on Stražnica, a series of multi-residential buildings and public and social buildings were gradually constructed. The arrangement of buildings on the sloped terrain was designed to provide residents and users with open views to the south, towards Ploče Bay, in accordance with the principles of modern urbanism and architecture.

A series of longitudinal buildings of a smaller scale was being constructed parallel to the terrain contour lines, visible in aerial photographs from 1960 (Figs. 6-8). The arches of the winding streets, Vladimir Nazor Street and Rogotinska Street, or three zones of smaller residential buildings follow the terrain contour lines, i.e. the arch of the original bay, before shore embankment. A 1955 longitudinal high five-storey building by Ivo Geršić (T. Pl. /Premerl/, 1988), colloquially called Blok, dominates the area above the series of the small-scale residential buildings. Most residential spaces have open views of the port and the bay, and have a southern orientation, in accordance with the principles of modern architecture. Initial architectural research showed that projects in Ploče were made by prominent Croatian architects Ivo Vitić, Lovro Perković, Zoja Dumengjić, Ivo Geršić, Mladen Frka, and others.

The new town was faced not only with challenges in construction, but also social living conditions, which is why an important criterion in the planning phase was to find the optimal solution for the establishment of all functions to form a cohesive organism (Urban Planning Institute of Dalmatia, 1973: 97). The citizens of the rapidly growing town faced various challenges, which was especially evident in the 1960s, as there were no public or social amenities – shops, markets, cultural buildings, public spaces, etc. That is why sociological research was conducted in the early 1970s by surveying the local population about their needs (Urban Planning Institute of Dalmatia, 1973). In brief, due to the intensive construction of residential buildings and a growing population influx, the new town needed the construction of its social and

9 The Neretva Valley experienced a landscape transformation through the reclamation of agricultural land for the cultivation of citrus fruits, which was co-financed by the FAO.

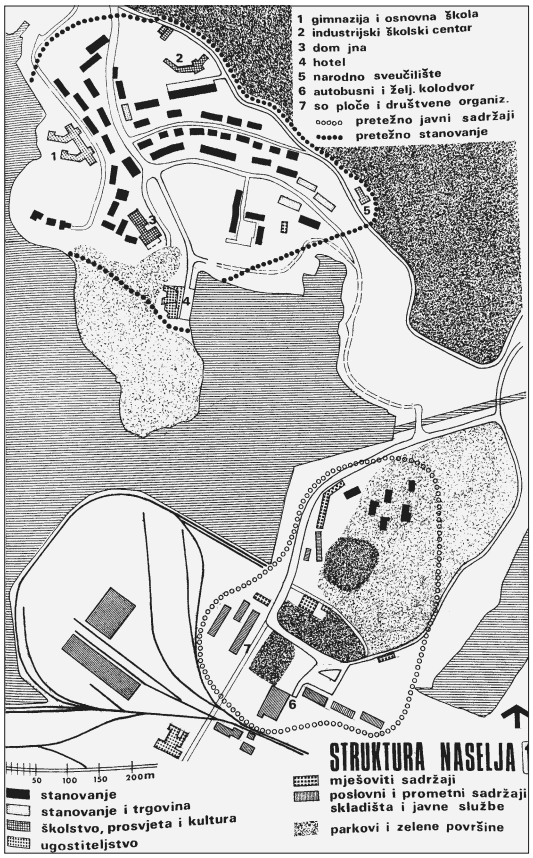

Fig. 8 Structure of Ploče

Fig. 9 Toponyms of the city of Ploče

public facilities (health centre, schools, cinemas, shops, etc.), involving many Croatian architects.

Conclusion

Ploče, the youngest town in the Croatian part of the Adriatic, certainly has a specific urban genesis compared to other cities because its urban planning (and its architecture) is not defined by ancient, medieval, or other historical layers, but by its town, constructed in the second half of the 20th century with a very favourable geographical position. They town went through a big construction expansion after World War II, although the technical prerequisites for the construction of the new town (the regulation of the Neretva and the construction of the railway line) were fulfilled in the previous periods. The new town expanded on the previously empty, undeveloped, rocky and partially swampy land to the east and the north by initially relying on the port and later on industry. Thanks to great investments in the port of Ploče itself during socialism, the port became the second busiest port for cargo transport in socialist Yugoslavia.

80 years later, the urban genesis of Ploče can be considered urban heritage and potentially a cultural asset from the socialist period, while the architecture needs to be researched in more detail. Its urban value can be assessed through spatial and structural completeness, urban stylistic characteristics, landscape position, and town image. All these values give it a specific urban identity of a town that was built in the second half of the 20th century. As a town with a homogeneous concept, its stylistic characteristics are related to the period of Modernism, which is evident in its position in the landscape, the appearance of the town, and the arrangement of its streets and buildings.

In addition to previously fulfilled prerequisites (regulation of the Neretva and the construction of the railway), the construction of Ploče in the first two decades after the Second World War rapidly changed the existing landscape of the Neretva delta through the construction of the port and city, as well as agricultural areas.[9]

The urban concept of Ploče is still visible, although it was degraded with a number of interpolations in the last decade of the 20th century and with unsystematic interpolations in the first two decades of the 21st century. Therefore, it is necessary to go through a detailed process of documenting, researching

and valorising the town because that is the basis of the future registration of the town as an urban heritage site.

In Croatia, Ploče is thematically comparable to Raša, Podlabin and Bata-villas (although they were built between the two world wars). Temporally it is comparable to Lički Osik and geographically to cities that emerged on river deltas or at their mouths, such as Solin at the mouth of the river Jadro, Omiš at the mouth of the river Cetina, Rijeka on the delta of the Rječina, Šibenik on the river Krka, etc.

In the beginning, Ploče was developing mainly as a strong transport and industrial centre, and public and social facilities (a health centre, educational, sports and recreational facilities, shops, cultural centres, a market, a hotel, etc.) were built along with residential buildings. From the last quarter of the 20th century, tourism has been increasingly developing in the town and beyond thanks to the construction of hotels and people's recreation on nearby lakes and in nearby rural areas.

Ploče, like other new cities, was subjected to new economic conditions (profit) through competitiveness and sustainability. In the increasingly weak economic conditions of life and work, the history of the town is burdened by its political past, and not even its urban and architectural heritage, which can be used as a tourist attraction, is recognised. Considering that the urban development and the architecture of Ploče are the heritage that should be affirmed through the heritage of modern urban planning, it should be affirmed in the context of heritage and valorisation as a valuable part of the town's identity, as well as a contribution to its increased tourism. Like many other cities built or significantly expanded during socialism (1945-1991), Ploče is subjected to new conditions and its urban history seems to be neglected.

Although numerous UN and EU documents connect heritage and sustainable development, heritage has not been recognised as a tourist attraction and it has not been used in the recognition of the spatial identity of Ploče. The architectural heritage of Modernism is also a value yet to be researched and valorised. In further research, the goal is to research in more detail and valorise the architectural achievements of architects from Croatia and the surrounding countries who gave their contribution to Ploče.

New cities undoubtedly require new approaches, incentives and design proposals for their existence and further development. However, it is necessary to consider their specific geographical and spatial characteristics, as well as economic, social and cultural potentials.

[Translated by Prof. Ana Uglešić]

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  - Digital orthophoto map 1:5000 (DOF5), 1968 and 2017, TIFF+TFW+DWG, HTRS96/TM – 14 sheets (Pozla Gora-1, Ploče-4 Gradac-1, Trpanj-1). List of bibliographic references comprises detailed references of all the used and cited source materials (an extensive list of bibliographic units which are not referred to in the text or notes is not acceptable). Bibliographic units are listed alphabetically according to the surname of the (first) author. If a particular text is written by several authors, their names are listed in the same way as they are printed in the original publication.

Illustration sources

Fig. 1 Authors, summer 2024

Fig. 2 Szavits-Nossan, 1939a and 1939b. According to copyright, graphic attachments older than 70 years do not need copyright.

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Fig. 5 left: *** 1955; right: State Geodetic Administration (Državna geodetska uprava – DGU) Zagreb – Central Dalmatia assignment, 1960, Series 64, Photograph 5588. The State Geodetic Administration – grants us rights of use for non-commercial use. The authors have no commercial benefits from the publication of the article.

Fig. 6 left: DGU Reambulation, Military Geographical Institute (Vojnogeografski institut – VGI) Sarajevo Primorje, 1966, Series 2, Photograph 2302); right: DGU map 1:5000 (DOF5). The State Geodetic Administration – grants us rights of use for non-commercial use. The authors have no commercial benefits from the publication of the article.

Figs. 7-8 Generalni urbanistički plan Ploče 1973 made Urbanistički zavod Dalmacije (Urban planning institute of Dalmatia). Two letters were sent to the City of Ploče in May and June 2024. They did not respond and they are considered to be in agreement.

Fig. 9 The State Geodetic Administration – grants us rights of use for non-commercial use. The authors have no commercial benefits from the publication of the article. Edited by the authors

Authors' biographies and contributions

Jasenka Kranjčević, Ph.D., is an assistant professor and scientific advisor at the Institute for Tourism, Croatia. Her main research interests are history of rural and urban settlements, architectural tourism heritage, and the history of tourism.

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.

Duje Jelčić, BArch, is a graduate student at the Faculty of Architecture of the University of Zagreb.

Conceptualisation: J.K. and Z.B.M.; methodology: J.K. and Z.B.M.; software: Z.B.M.; validation: J.K. and Z.B.M.; formal analysis: J.K., Z.B.M. and D.J.; investigation: J.K., Z.B.M. and D.J.; resources: J.K., Z.B.M. and D.J.; writing – original draft preparation: J.K. and Z.B.M.; writing – review and editing: J.K. and Z.B.M.; visualization: J.K. and Z.B.M.; supervision: J.K. and Z.B.M.; project administration: J.K.; funding acquisition J.K. and Z.B.M. All authors have read and agreed to the published version of the manuscript.

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Fig. 1 Comparative total construction area analysis of Abide Sitesi

Özlem Balci Öztürk[1], Burak Öztürk[2]

[1] Kocaeli University, Faculty of Architecture and Design, Department of Architecture, 41100 Kocaeli, Turkey
https://orcid.org/0000-0002-7489-0216
[2] Istanbul Technical University, Faculty of Architecture, 34467 Istanbul, Turkey
https://orcid.org/0009-0002-6160-6279

ozlem.balci@kocaeli.edu.tr
burozt@gmail.com

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Abide Sitesi as Innovative Approach to Build-and-Sell Housing Production in Post-World War II Istanbul

Abide Sitesi
Build-and-sell
Housing in Istanbul
Housing production
Mass housing

Yapsatçılık, meaning build-and-sell, is a capital-free model based on apartment sharing between landholders and developers that became widespread among the post-war housing production methods in Turkey. The Abide Sitesi settlement in Istanbul's Mecidiyeköy district is the focus of this study, as it is the first large-scale initiative of the build-and-sell method and, contrary to all criticism, proves that the method could produce successful practices. Prior to this, Kemal Ahmet Aru prepared a garden-city master plan for the same land in 1955, but this plan was never realized. After various legal regulations made it possible to open this land for settlement, in 1975, Yaşat Inc. started the Abide Sitesi project. This study examines the transformation effects of urban development dynamics on the built environment through the Abide Sitesi case. In this context, Abide Sitesi offers an in-depth analysis of project-to-construction processes, housing sale policies, and architectural characteristics. The study benefits from municipal and newspaper archives, and the theoretical framework is supported by site analysis and photographic documentation.

Introduction

Turkey was not involved in World War II, but due to its intercontinental location, it was affected by post-war economic changes. With the approach of the mid-century, individuals facing financial challenges in rural areas started to move to urban centres. As a result, Istanbul's population increased, but there was not enough housing stock. Immigrants sought solutions with their means, and slums emerged all over the city (Sey, 1984). According to Özdemir Sarı (2019), the construction of slums was a response to the urgent housing demand, which increased the risk of unplanned urbanization.

The housing challenges faced by post-war developing countries, such as Turkey, have also become the focus of international technical and financial assistance initiatives. The United States provided comprehensive aid through the Truman Doctrine and the Marshall Plan, suggesting various housing production methods and financial support. The initial beneficiaries were two neighbouring countries, Greece and Turkey. Kalfa (2021) noted that Greece had received extensive funding to repair the damage caused by the war and to support housing production. Furthermore, Karataş (2022) stated that the Marshall Plan promoted housing production in Turkey, and housing experts[1] from the United States visited Turkey and prepared reports under the Plan. Skidmore, Owings, and Merrill[2] drafted the initial report, revealing the threats of unplanned growth and health problems faced by those living in infrastructure-deficient environments (Skidmore et al., 1951). Realizing the housing problem through these reports, the government started initiatives to struggle against it. The first productions began following the legal regulations that made housing construction possible and the results of practical studies. The most prevalent method of housing production, build-and-sell, caused the rapid urbanization of Istanbul.

This study, focusing on the first large-scale build-and-sell production method, sheds light on the dynamics of urban development in Istanbul through the case of Abide Sitesi (Fig. 2). Contrary to all the criticism against build-and-sell, Abide Sitesi is crucial as it proves that good-quality production is possible. Within the scope of this study, the changing land utilization patterns due to rapid urbanization, the factors affecting such changes, and their effects on the housing-user axis are examined. The rapid urbanization of metropolitan Istanbul and "build-and-sell" as a production method at the critical point of the faster housing production that serves it are discussed through Abide Sitesi. This study illuminates how Abide Sitesi provides an optimal solution to the dilemma of urban rent and user-centred design.

As a study method, research in municipal archives provided concrete data on the production process of Abide Sitesi. The Abide Sitesi project obtained from the district municipality archives enabled the identification of actors involved in the production process, such as landholders, developers, and architects. A master plan designed by Kemal Ahmet Aru and provided by the municipal archives revealed yet another neighbourhood project proposed for the same land before Abide Sitesi, which has never been never realized. This study draws upon various sources, including promotional booklets, brochures, and newspaper advertisements in the author's archive, to identify clues about the architecture, construction process, and sales strategies. In addition, an analysis of the current situation obtained through on-site observations at Abide Sitesi has contributed to this research.

1 According to Karataş (2022), Skidmore, Owings, and Merrill (SOM) in 1951, Donald Monson in 1953, Charles Abrams in 1954, and Bernard Wagner in 1956, traveled to Turkey with the objective of exchanging expertise on a transnational scale.

2 SOM is an international architectural firm. Erdim (2020) indicated that the Istanbul Hilton Hotel was one of SOM's numerous projects worldwide, and during their visits to the construction of the hotel, they also reviewed Turkey's housing policies to prepare a

Build-and-Sell as a Post-War Housing Production Method in Turkey

The housing crisis in cities became evident, and the government started to struggle against it in the post-war period. The first step was the establishment of the Türkiye Emlak Kredi Bank[3] in 1946. Another legal regulation was organizing workers' housing cooperatives[4] in 1953. Both the Bank and cooperatives developed neighbourhoods with detached or row houses. By the 1960s, these typologies were abandoned, and all housing production turned into apartment blocks as a consequence of the enactment of the Condominium Law[5] *(Kat Mülkiyeti Kanunu)* in 1965. Tapan (1996) argued that economic policies required conditions for the free market in the housing industry, and subsidized housing, such as that produced by the Bank or workers' housing cooperatives, became obsolete over time. A new legal arrangement enacted in 1964, the Public Housing Standards *(Halk Konutları Standartları),* set limits on housing projects that could receive long-term, low-interest loans. This arrangement aimed to make a more efficient use of state budget allocations and to restrict luxury housing construction. The maximum dimensions of the rooms and the house were determined by the family size. In addition to guiding the architectural projects of the houses, it also included details on the preferred building materials, electrical wiring, and sanitary systems ('Halk Konutları Standartları', 1964). A new housing production method became popular after the enactment of the Condominium Law in 1965. This method, known as build-and-sell, has rapidly spread in housing production because of its economic advantages. With this method, developers agree with landholders and construct multi-storey buildings on the land, providing landholders with several apartments. This results in a mutualistic atmosphere where the landholder owns apartments without assuming any financial risk and the developer obtains construction land without requiring a direct purchase.

Fig. 2 Aerial photo of Abide Sitesi and its location in Istanbul

Build-and-sell is a worldwide housing production method. Shing et al. (2012) stated that this method was common even in developed countries, such as the United Kingdom, the United States, and Australia, where housing demand and supply have been more in equillibrium. Furthermore, Greece, another developing country that received assistance through the Marshall Plan, adopted a comparable production approach in the post-war era. Kalfa and Theodosis (2022) described the practice, called *antiparochì* in Greek, as a system in which landholders transferred their property to contractors in exchange for an agreed-upon number of apartments or shops in a multi-storey building constructed on that land. As the description indicates, the Greek *antiparochì* was not at all different from the Turkish *yapsatçılık*. Moreover, in both countries, individuals lacking technical training or capital but with entrepreneurial spirit could become active figures in housing production through this method. The prospect of housing sales before construction creates an op-

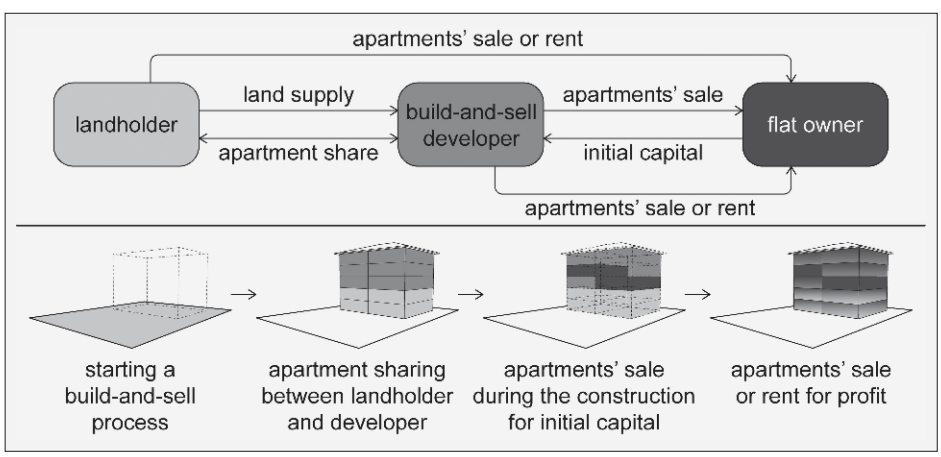


Fig. 3 Flowchart of the build-and-sell process of housing

detailed report on optimal housing and construction sector structuring. This report was among one of the initial studies addressing Istanbul's housing problem.

3 Türkiye Emlak Kredi Bank was a public institution and joint stock company. This hybrid institution was responsible for both financing housing production and construction. Indeed, the Bank developed Istanbul's inaugural planned neighbourhoods, such as Levent and Koşuyolu, within the period's urban peripheries.

4 The government enacted Law No. 6188 in 1953, and workers' housing cooperatives commenced production. Municipalities allocated planned state-owned land under Law No. 6188, while the Bank facilitated financing for these cooperatives.

5 Prior to the enactment of Condominium Law *(Kat Mülkiyeti Kanunu)*, it was not permissible for each unit on disparate levels of a multi-storey edifice to be registered under separate proprietors. However, with the advent of the Condominium Law, the issue acquired a legal basis, and each unit belongs to different users.

portunity environment in Turkey. In this way, entrepreneurs without capital could procure the necessary funds for the construction project through early sales after reaching an agreement with the landholder. The sale of the remaining apartments after the completion of the construction phase was solely to generate profit (Fig. 3). Ruhi Sipahioğlu (2020) argued that pre-sales can cover the entire construction cost and that this financial strategy distinguishes build-and-sell entrepreneurs from other housing developers. Indeed, Türkiye Emlak Kredi Bank sold houses in multi-year instalments while workers made payments over the years, thus enabling the cooperative to accumulate capital. Tekeli (2012) asserted that build-and-sell developers who finance construction costs through pre-sales tend to generate higher profits by increasing sale prices of apartments in later stages and after construction.

The Condominium Law enabled the construction of multi-storey buildings, thereby reducing housing costs as the number of constructed units on urban land increased. The high profits of build-and-sell developers facilitated the rapid dissemination of this method. Furthermore, the planning initiatives of the period promoted practices rather than regulating them. Kuban (1996) asserted that these plans lacked quantitative data and qualitative observations. One such example was the 1964 Istanbul Floor Master Plan *(Istanbul Kat Nizamları Planı)*, which was limited in scope and aimed at addressing quotidian issues. Erbaş (2018) posited that the Istanbul Floor Master Plan, which increased the permitted height of buildings in designated areas of Istanbul, reflected the desires of build-and-sell production. Işık (1995) defined build-and-sell in Turkey as an alliance of different social groups in urban development partnership. Among these groups, landholders could transform their property into housing without incurring any financial obligations, developers could generate profits without utilizing capital, and residents could procure affordable housing. Although this collaboration appeared beneficial for Istanbul, which experienced a housing crisis, unplanned practices damaged the city over time. Işık (1995) criticized the build-and-sell system for creating pressures for level increases in the zoned part of the city. Similar perspectives are prevalent in the urbanization-housing literature on the period. The reasons for this criticism are the implementation of the build-and-sell method by unqualified actors and the spread of low-quality productions. Tekeli (1978; 1994) noted out this method for creating an environment with low-use value and monotonous, high-density urban areas with poor infrastructure and social services. Toydemir (1970) provided a distinct critique of the issue from a structural perspective, highlighting that the methods used to promote economic efficiency in construction activities may lead to stability problems. The common thread among the criticism was the dearth of design services in build-and-sell practices. According to Tekin and Akpınar (2014), the architect's limited role in the build-to-sell process is to provide a maximum construction area permitted by regulations.

Güzer (1995) stated that contrary to this criticism, developers always had ingenious ideas to solve the housing problem, but they were unfairly treated. This method enabled landholders who lacked sufficient financial resources or access to credit to become property owners, thereby facilitating the participation of limited capital in housing production (Işık, 1991). If this production method, which emerged within the actual needs of the period and the existing possibilities, could have been adapted with modern methods, much more qualified examples could have been revealed in urban and housing sectors. The few quality examples produced by visionary developers in large cities such as Ankara and Istanbul prove this prediction.[6] The Abide Sitesi project is an initiative with design qualities and comprehensive mass housing in the build-and-sell production method. This demonstrates that contrary to all criticism, successful products can be produced when professionals perform the build-and-sell method.

Evolution of Land Use Approaches in Abide Sitesi

Abide Sitesi is a settlement constructed in the Mecidiyeköy district of Istanbul in the late 1970s. To understand the relevance between the production process and the build-and-sell method, it is essential to investigate the historical background. The related land belonged to Milli Re.[7] In the early 1950s, Milli Re purchased land in Mecidiyeköy to address the housing needs of its employees (Kiralık çiftlik ve, 1953). Archival documents indicate that Milli Re Land Master Plan *(Reasürans Arazisi İfraz Planı)* was prepared for the land. Kemal Ahmet Aru, the designer of the Levent and Koşuyolu neighbourhoods[8], proposed a similar project for the Milli Re land in 1955 (Fig. 4). He described this 161-unit project as follows: The land belonging to Milli Re has a gentle downward slope toward the north. Detached and row houses are placed according to the land's slope, considering its architectural composition (Aru, 1955).

Aru's proposal for this project, which covers an area of 10 hectares, was never construct-

6 The Rer-1 apartment block, designed by architect Nejat Ersin in 1964, is a high-quality example (Resuloğlu, 2018). In addition, Mesa and Soyak Construction companies have qualified housing implementations (Eryıldız, 1995). For instance, the Göztepe Soyak Housing Development, designed by Behruz Çiniçi in 1988, is a significant example of mass housing (Ekincioğlu, 2001).

7 Milli Re *(Milli Reasürans)* is a joint stock company that was established in 1929 by İşbank to obtain exclusivity in the reinsurance field.

8 Türkiye Emlak Kredi Bank developed these two neighbourhoods. Construction of Levent on the European side commenced in the late 1940s, while Koşuyolu on the Anatolian side began in the early 1950s. Designed by architect Rebii Gorbon and Kemal Ahmet Aru, Levent (Aru & Gorbon, 1952), and Koşuyolu (Salman, 2019), neighbourhoods were completed in the mid-1950s.

9 Yaşat Inc. was established as an Istanbul-based company in 1974. The company's CEO, Yaşat Manav, is an architect who graduated from Istanbul Technical University in 1960. Before Istanbul venture, he pursued a career as a build-and-sell developer in Mersin between 1963 and 1972. During this period, he constructed three significant apartment blocks: Bulvar in 1967, Fuar in 1968, and Palmiye in 1969. Additionally, he developed Mersin's first complex commercial building, the Yaşat İşhanı, in 1972. The company realized two critical projects in Istanbul: The Abide Sitesi and the Korukent project in Ortaköy between 1975 and 1983. In 1997, Manav established a real estate development company named "Yasat USA, Inc." in Florida, USA, and it has been in operation for five years (Ekimci, 2000).

ed. The reason for the non-construction remains unknown. It can only be interpreted within the legal framework of the period. Since municipalism was not sufficiently organized, developers had to build infrastructure, roads, and housing units on neighbourhood-scale projects. This significantly increased construction costs. For high-budget constructions, the Bank provided financing support to workers' housing cooperatives. However, since Milli Re employees were high-income, they could not benefit from this support and must have experienced financing problems.

The Greater Istanbul Master Plan Bureau was established in 1966 to conduct practical urban planning studies for Istanbul following the principle of modern urban planning. Despite the ongoing efforts of various individuals and groups to develop the master plan, the lack of comprehensive primary research and the rapid pace of population growth in the area have hindered the preparation of a holistic urban plan. The Istanbul Metropolitan Area Master Plan *(Istanbul Metropoliten Alan Nazım Planı)* was initially approved in 1980. Prior to this date, development activities had continued only through regional plans. Therefore, these regional plans made the construction of the Abide Sitesi possible. The Mecidiyeköy district, where Abide Sitesi is located, was a rural area outside the city until the mid-century. It was first defined as a planned urban area in the 1953 Beyoğlu Side Master Plan *(Beyoğlu Ciheti Nazım Planı)*. Bilsel (2015) indicated that the Mecidiyeköy, Levent, and Etiler districts were incorporated into the Beyoğlu Side Master Plan as settlements. This plan proposed constructing a residential development comprising two-storey houses with a garden. As a result of the expansion of Beyoğlu's boundaries, Mecidiyeköy and its environs were constituted as a distinct administrative area in 1954, designated as Şişli. A series of urban developments since the mid-1960s initiated transformations in the Mecidiyeköy area, where Milli Re land is located. In 1968, Istanbul Municipality developed the Mecidiyeköy-Gayrettepe-Yıldız Posta Avenue Plan *(Mecidiyeköy-Gayrettepe-Yıldız Posta Caddesi Planı)*, which proposed 3, 4, and 5 storey apartment blocks instead of two-storey houses with garden. However, a revised version of this plan was submitted to the City Council, proposing buildings of 5, 8, and 12 storeys, and they approved. Tekeli (2012) stated that apartment blocks increased in the area following the implementation of the new plan, and there were several mass housing initiatives; the most notable was Abide Sitesi. Bilsel (2015) indicated that Mecidiyeköy-Gayrettepe-Yıldız Posta Avenue Plan transformed the area's character, with the existing structure density increasing by two to three. Construction of the Bosporus Bridge was another critical development that transformed Mecidiyeköy. It was opened in 1973, and the bridge access road passed Milli Re land. Tapan (1998) stated that the bridge changed the city's time-distance matrix and determined the metropolitan area's development dynamics. The Milli Re land was affected by these transformations and became accessible from everywhere. In the 20 years since the Aru's neighbourhood project, a novel method of housing production, build-and-sell, has gained prominence, accompanied by a notable appreciation in land value. Construction company, Yaşat Inc.[9], that had recently relocated its headquarters to Istanbul, took advantage of this opportunity.

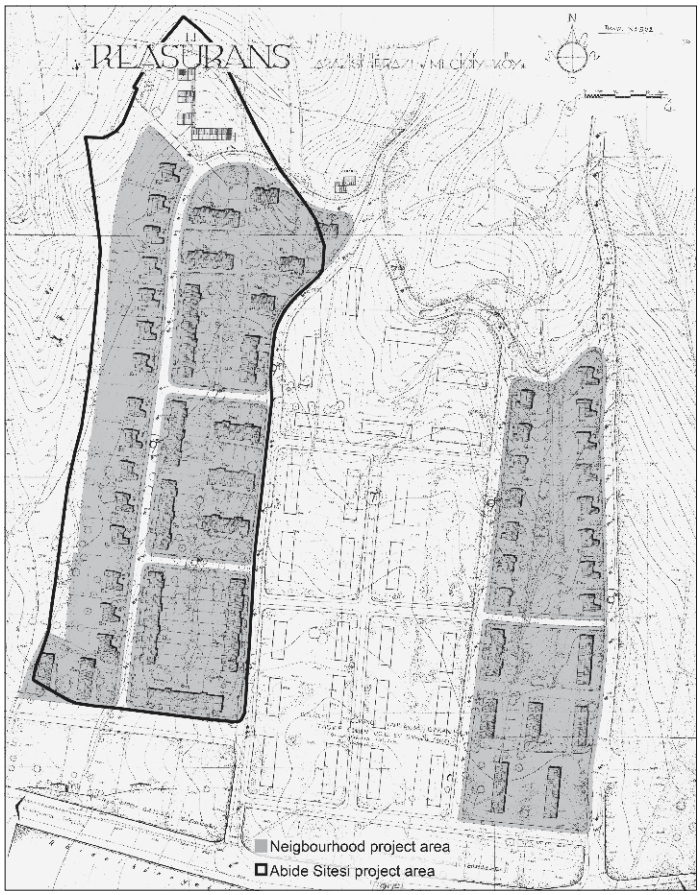


Fig. 4 Milli Re Land Master Plan designed by Kemal Ahmet Aru, 1955

Yaşat Inc. constructed two cooperative blocks with 108 units for Milli Re, the landholder, as a contractor and received about 5 hectares of land in this area in exchange. Until then, small land with a capacity of only one or two apartment blocks was preferred in conventional build-and-sell projects, and the landholder used to receive several apartment units from this agreement. The numerical

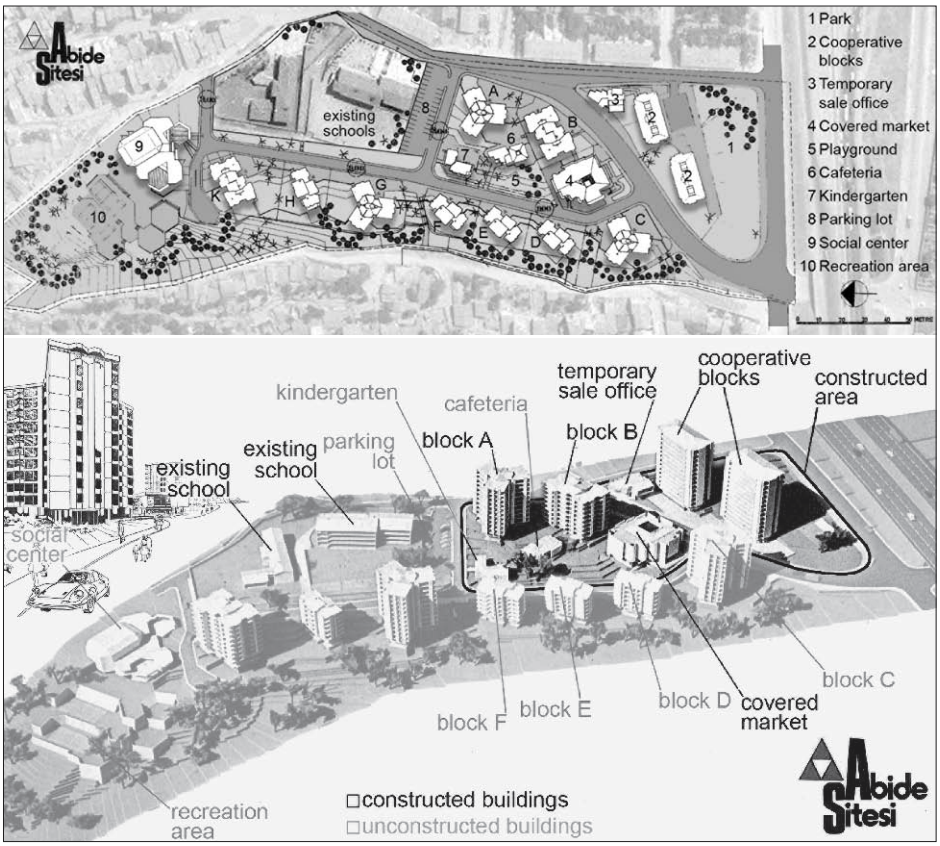


Fig. 5 Master plan (up) and model (down) of Abide Sitesi designed by Yaşat Inc., 1975

data proves that the Abide Sitesi initiative of Yaşat Inc. is a large-scale project in terms of build-and-sell. In this regard, Yaşat Inc. prepared the most comprehensive housing project ever developed in Istanbul by using a larger land area than standard build-and-sell production in 1975 and brought an innovative approach to the build-and-sell production method. Although the area became accessible, it was still on the periphery, and developers needed to offer numerous benefits to market the housing units. The company designed the Abide Sitesi project along these lines, planning buildings for the everyday necessities of the people (Fig. 5 up). The project includes commercial buildings such as a covered market, a cafeteria, and public buildings such as a kindergarten and social centre. Furthermore, the landscape design incorporated parking lots, a playground, and recreation areas. While planning the Abide Sitesi, Yaşat Inc. incorporated two previously constructed schools[10] on the project site into its design by proposing green areas and parking lots around them.

Abide Sitesi was a comprehensive project that responded to the needs of the time. However, Istanbul's rapid urbanization invalidated predictions of the city's future. The suburban areas suddenly transformed into active commercial centres. According to Yıldızgördü and Yorgancıoğlu (2021), with the construction of the Bosporus Bridge, the around Abide Sitesi was transformed into a business centre, and even the existing residential buildings were reused for commercial purposes. Commercial pressure in the environment affected the construction of Abide Sitesi, which commenced in 1975 and continued for only five years. During this period, two cooperative blocks for Milli Re employees, two apartment blocks, and a covered market were built. Following this limited production, the Abide Sitesi project ended in 1980 (Fig. 5), and the company started selling the remaining parcels. They sold the southern part in 1981 and the northern part in 1985 (Arman, 1985). Simultaneously with the conclusion of the Abide Sitesi project, the build-and-sell method declined in popularity in Istanbul. Tekeli (2012) dates the practical limits of this production method to 1980, citing the absolute profit values in the city as the reason why the developer's share to landholder increased. The reduction in production led to a rise in house prices and, indirectly, to a decline in sales. It can be argued that this stagnation in the housing market also led to the end of the project. In a relatively brief period, the environment of Abide Sitesi underwent a significant transformation, evolving from a suburban area into a commercial district. To analyse this transformation through land use, it is beneficial to compare two proposed projects and the current situation of the same piece of land, which is 5 hectares (Fig. 1).

The opening of the Milli Re land for settlement came up in 1955 with a neighbourhood garden-city plan designed by Aru. Milli Re Land Master Plan, consisting of 105 units and two public buildings, had a high proportion of green space and low-density construction. Over the following two decades, the "centre" status of the area increased, and the Abide Sitesi, planned in 1975, consisted of multistorey apartment blocks with 444 units. Compared to Aru's plan, the design of Abide Sitesi reduced green areas but included various commercial and public buildings to accommodate the daily needs of the envisioned population. The fast-changing dynamics of the city and economic conditions precluded the full implementation of the Abide Sitesi. Commercial buildings were not included in Aru's plan, whereas in Abide Sitesi, they served the needs of the housing area. Today, as the area's commercial potential has increased, high-rise trade centres occupy a large part of the land.

10 As the population of Mecidiyeköy grew over time, the necessity for constructing certain public edifices became apparent. The government expropriated part of the Milli Re project land and built a primary school in 1966 and a high school in 1970.

Characteristics of Abide Sitesi: from Concept to Realization

The Abide Sitesi project is Istanbul's first large-scale build-and-sell initiative. The project, which includes a unique approach, from the design concept to the construction process and housing sales strategies, started in 1975. Kuban (1968) stated that architecture should not be limited to a single building scale but should be organized according to the urban planning discipline, considering environmental data. Following this criterion, Abide Sitesi provides a sustainable built environment in harmony with environmental data and high-use value within the planning principles.

"Advertisement" as a Sales Strategy

Using slogans in marketing mass housing projects is a widespread strategy in Turkey. Şahin and Şener (2021) noted that apartments to be marketed have increased as the "build-and-sell" production method spread. This situation led company owners to start advertising, and the number of advertisements in which slogans were often used began to grow. Many slogans used to sell mass housing built in Izmir in recent years had the subject of research's Kuru and Ek (2021). The dominant slogans in this study are status, experience, and location, with fewer emphasizing architectural and financial dynamics.

As a sales strategy for Abide Sitesi, the developer advertised the project in daily newspapers with slogans such as close to everywhere, sound investment, and modern (Fig. 6). Like the İzmir case, status and location were at the forefront of the slogans. In addition, unlike this case, finance, social facilities and architecture were also prominent. For example, "modern architecture" was a specific sales slogan during the 1970s, when Abide Sitesi was realized, as it was perceived as an image of prestige; however, today, changing perceptions of prestige focus slogans on status and life experience rather than architecture. Likewise, while financial mottos were common in Abide Sitesi slogans, they appear less in recent years, in parallel with changing economic conditions and new investment trends.

Construction Process

Construction of the project started in 1975 with the approval of the plan for two apart-

Fig. 6 Advertisements in the Milliyet Newspaper

Fig. 7 Photographs from the Abide Sitesi construction: (A) 1976, (B) 1977, (C) 1976, (D) 1977

	Covered market	Block A	Block B
Completed in	1980	1978	1978
Architect	Çetin İlkin	Betül Günal	Zafer Koçak
Storeys	4	11	9
Structural system	Reinforced concrete	Reinforced concrete	Reinforced concrete
Circulation	1 stairs, 1 service lift	1 stairs, 2 lifts	2 stairs, 2 lifts
Units	78 stores	60 flats (3 rooms)	45 flats (2-3 rooms)
Unit area	12-49 m²	110 m²	125-153 m²
Construction area	3200 m²	6820 m²	6480 m²

Fig. 8 The completed buildings of the Abide Sitesi

ment blocks. Blocks A and B were completed in 1978, and the covered market was constructed between 1977 and 1980 (Fig. 7). To supply the concrete needed for the construction of Abide Sitesi, a concrete plant was established on the site, a relatively rare practice in the build-and-sell sites of that time (Yaşat Inc., 1976a). The construction system of the covered market and apartment blocks is reinforced concrete (Fig. 8).

Perforated bricks are used for exterior and partition walls. The ribbed slabs conceal the beam details of the reinforced concrete frame. The total construction area is 3200 m² for the covered market, 6820 m² for Block A, and 6480 m² for Block B (Yaşat Inc., 1976b).

Developing international relations, a booming economy, and increasing production capacity allowed new materials and technologies to enter the architectural market in the 1970s (Hasol, 2017). The blocks of Abide Sitesi were equipped with sound and thermal insulation, central heating, hot and cold-water systems, generators, television aerials, and telephone lines for each apartment, which were in line with the technological conditions of the time. The interior floors of the apartments were parquet in the lounge, stained glass in the entryway, vinyl floor covering in the bedrooms, marble in the kitchen, and tile in the bathrooms (Yaşat Inc., 1977).

Architectural Characteristic

The Abide Sitesi covered market and apartment blocks, which commenced construction in the 1970s, accurately reflecting the spirit of the period of pluralism through its design approach. A rationalist attitude characterizes the apartment blocks completed in 1978. The architectural design of the market, completed in 1980, represents an authentic case of independent searching in form, offering a new interpretation of traditional values.

Abide Covered Market was designed by architect Çetin İlkin[11] (Fig. 8). In conjunction with the cafeteria, kindergarten, and playground, the covered market configuration creates a small square and focal point in the middle of the cluster of apartment blocks. The 4-storey covered market has 78 stores with areas ranging from 12 m² to 49 m², and a 2-storey parking garage with a capacity of 200 cars is located underground. The covered market plan consists of a series of stores arranged around a courtyard (Fig. 10). Based on a courtyard, this design concept reinterprets and modernizes traditional values.[12] Inspired by the traditional conception of the bazaar, where all the traders are together, the courtyard creates a common area of interaction where traders and customers meet. An important parameter defining this courtyard is the use of controlled light. Floor halls facing the courtyard refer to the common area with small balconies (Fig. 9).

Yücel (2005) stated that a pluralist approach to architecture existed in the 1960-1980. The covered market reflects this approach with the unique form design. Some store units contribute to the form aesthetics of the building with a cylindrical or right-angled cantilever on the facade. The same goes for floor service lifts and halls form cylindrical cantilevers[13] on the facade. Abide Sitesi was a unique case of covered market typology in which experimentation with diverse architectural forms prevailed.

The Abide Sitesi master plan includes nine housing blocks. These housing blocks are categorized into three types. Type 1 (A, C, G) has the shape of a three-sided star. Type 2 (B, K) are twin blocks. Type 3 (D, E, F, H) has a low rise compared with the other types (Fig. 5 up). Designed by architect Betül Günal[14], Block A consists of 11 levels above ground (Fig. 8). The building comprises 60 flats with three rooms of 110 m² (Yaşat Inc., 1976b). The three-sided star form of Block A provides a vista from all directions. There are six flats on each floor. Three separate units formed by grouping these flats into two constitute the primary form of the apartment block (Fig. 11). In the floor plan, the bedrooms and balconies are cantilevered to the outside, creating a dynamic effect. Prismatic forms with bevelled corners define balconies. The ground floor is set back to give the block a more expressive appearance.

11 Çetin İlkin graduated from the Istanbul Academy of Fine Arts in 1961. He practiced his profession in major cities such as Istanbul and Ankara and lived in France for some time. He won various awards in urban planning competitions: Erzurum's Master Plan Competition, 1966, 1st Honourable Mention (Erzurum İmar Planı, 1966), and Adana's Master Plan Competition, 1966, 2nd Honourable Mention (İller Bankası Genel, 1966).

12 Similar cases of this plan form, reflecting the introversion of traditional design, can be seen (Balcı Öztürk, 2022) in the plan schemes of the Turkish History Association (Tanyeli & Yücel, 2007) and the Turkish Language Institute (Kortan, 1997).

13 Cylindrical cantilevers on the exterior are visible in other contemporary samples from Turkey, such as the METU library (Çinici A. and Çinici, B., 1975) and the Zincirlikuyu Highways Facilities (Vanlı, 2006).

14 Betül Günal graduated from the Istanbul Academy of Fine Arts in 1971. Throughout her professional career, she worked in the planning and technical office of Yaşat Inc. and participated in the Abide Sitesi and Korukent projects as well as other works in the United States.

15 Zafer Koçak graduated from Istanbul Technical University in 1958. Koçak was the owner and member of the editorial board of Mimarlık Journal from 1963 to 1964 (Güngör, 1984). He won awards in many project competitions: Ege University Urban Planning Competition, 1958, 1st prize (Ege Üniversitesi Şehircilik, 1959), and Basmane Tourism and Trade Centre Competition, 1984, 1st prize (Basmane Turizm ve, 1984).

Fig. 9 Facade and interior photographs of covered market

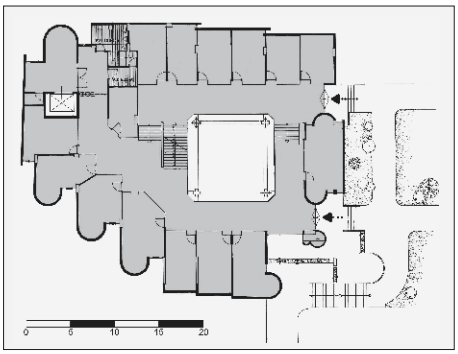


Fig. 10 Ground floor plan of covered market

Designed by architect Zafer Koçak[15], Block B consists of 9 levels above the ground (Fig. 8). The building is a twin block with two entrances. The first entrance provides access to two flats on each floor, and the second one provides access to three. Each apartment has a different layout, ranging from 125 m² to 154 m² (Yaşat Inc., 1976b). There are five flats on each floor, four with three bedrooms and one with two bedrooms (Fig. 11).

The lounge plan's angled shape and the balconies' triangular form add dynamism to the façade. In the facade layout, a prismatic shape with bevelled corners is repeated in the details, parallel to the design of Block A. There is an octagonal form on the glass surfaces; the balcony railing details.

Conclusion

Build-and-sell is the housing production method that was effective in Turkey from the mid-1960s until 1980. Participatory planning manifests itself in the process; landholders, developers, and flat owners are all part of it. However, the widespread monopolization of the production method by micro-entrepreneurs and the realization of design processes that are far from professionals' guidance have resulted in low-quality construction.

Nevertheless, albeit few, the quality examples created by the initiatives of broad-visioned developers show that if this production method's adaptation with modern methods had been done successfully, more prosperous examples could have been achieved. Contrary to typical build-and-sell practices in Abide Sitesi, the developer, Yaşat Manav was an architect, and qualified architects played an active role in every phase. The construction management, processes, and actual products of Abide Sitesi are presented in this study as valuable evidence.

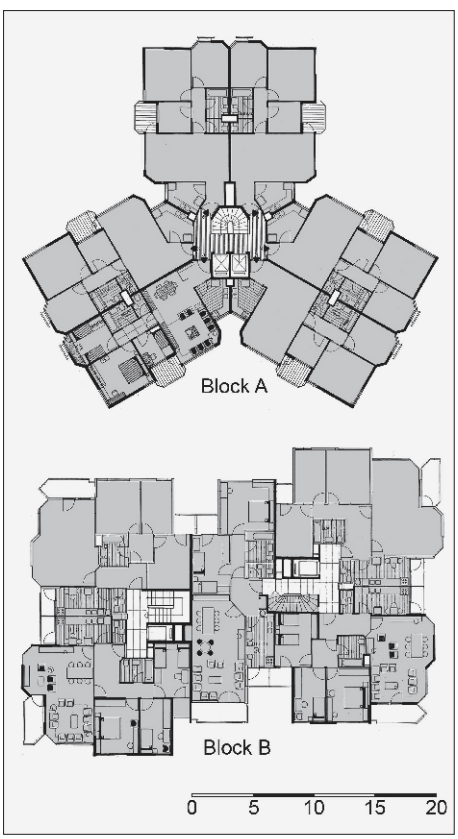
The rapidly evolving urban dynamics in metropolises such as Istanbul significantly impact urbanization. These dynamics have transformed the environment around Abide Sitesi from a suburb in the mid-1950s into a dense commercial district today.

During the period under study (1955-2024), the housing area decreased as the environment became a centre, and the commercial area increased with a reverse acceleration. Today, the environment has transformed into a chaotic area with high-rise trade centres, a few apartment blocks without social facilities, and almost no green areas. Through the analysis of the area, it is possible to say that as urban rent increases, "user-centred" design principles change to "profit-oriented", and the use value and quality of the built environment decrease.

The process of the Abide Sitesi project, which can be considered an optimal solution, is crucial in this context. The top-level decisions of the authorities in urban development areas should prioritize achieving the optimal balance between user-oriented design and urban rent. In this manner, both subsidized housing and production methods that are part of the private sector, such as the build-and-sell method, can be responsible for maintaining this balance.

Today, the build-and-sell method is still actively used in construction processes but is mostly continued by micro-entrepreneurs and is of low quality. In this respect, Abide Sitesi is still worth examining and prototyping as it was the first qualified and large-scale initiative. The project, integrated with social facilities and user-centred buildings, has high usage value and architectural quality. This case demonstrates that the build-and-sell production method can successfully contribute to urban development when managed by professional developers. In addition to their importance in urban planning, the apartment blocks and covered market of Abide Sitesi also shed light on Turkey's housing sale policies and construction processes during the 1970s. Moreover, these buildings are unique examples of the pluralist approach in Turkish architecture between 1960 and 1980.

Fig. 11 Plans of apartment blocks



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Sources of illustrations

Figs. 1, 3, 6, 8 Authors, 2024
Fig. 2 Map data ©2024 Google
Fig. 4 Istanbul Metropolitan Municipality Archives, visualized by authors
Figs. 5, 10, 11 Yaşat Inc., 1976a, visualized by authors
Fig. 7 A: Yaşat Inc., 1976a; B, C: Salt Research, Ali Mukbil Gökdoğan Archives, D: Yaşat Inc., 1977
Fig. 9 Authors, 2022

Authors' biographies and contributions

Özlem Balci Öztürk, M.Arch. is an academician of Architecture at Kocaeli University. She is presently working on her Ph.D. dissertation. Area of scientific interest: Post-war Architecture and New Brutalism. https://avesis.kocaeli.edu.tr/ozlem.balci

Burak Öztürk received his MSc degree in restoration in 2017 and is now a Ph.D. candidate. He continues to study 20th-century social housing. He is a lecturer at Ozyegin University. He is also a member of Docomomo International.

Conceptualization:, Ö.B.Ö and B.Ö.; methodology: Ö.B.Ö and B.Ö; validation: Ö.B.Ö and B.Ö; formal analysis: Ö.B.Ö. and B.Ö.; investigation: Ö.B.Ö.; resources: Ö.B.Ö and B.Ö.; writing – original draft preparation: Ö.B.Ö. and B.Ö.; writing – review and editing: Ö.B.Ö. and B.Ö.; visualization: B.Ö.; supervision: Ö.B.Ö.; project administration: Ö.B.Ö.

Both authors have read and agreed to the published version of the manuscript.

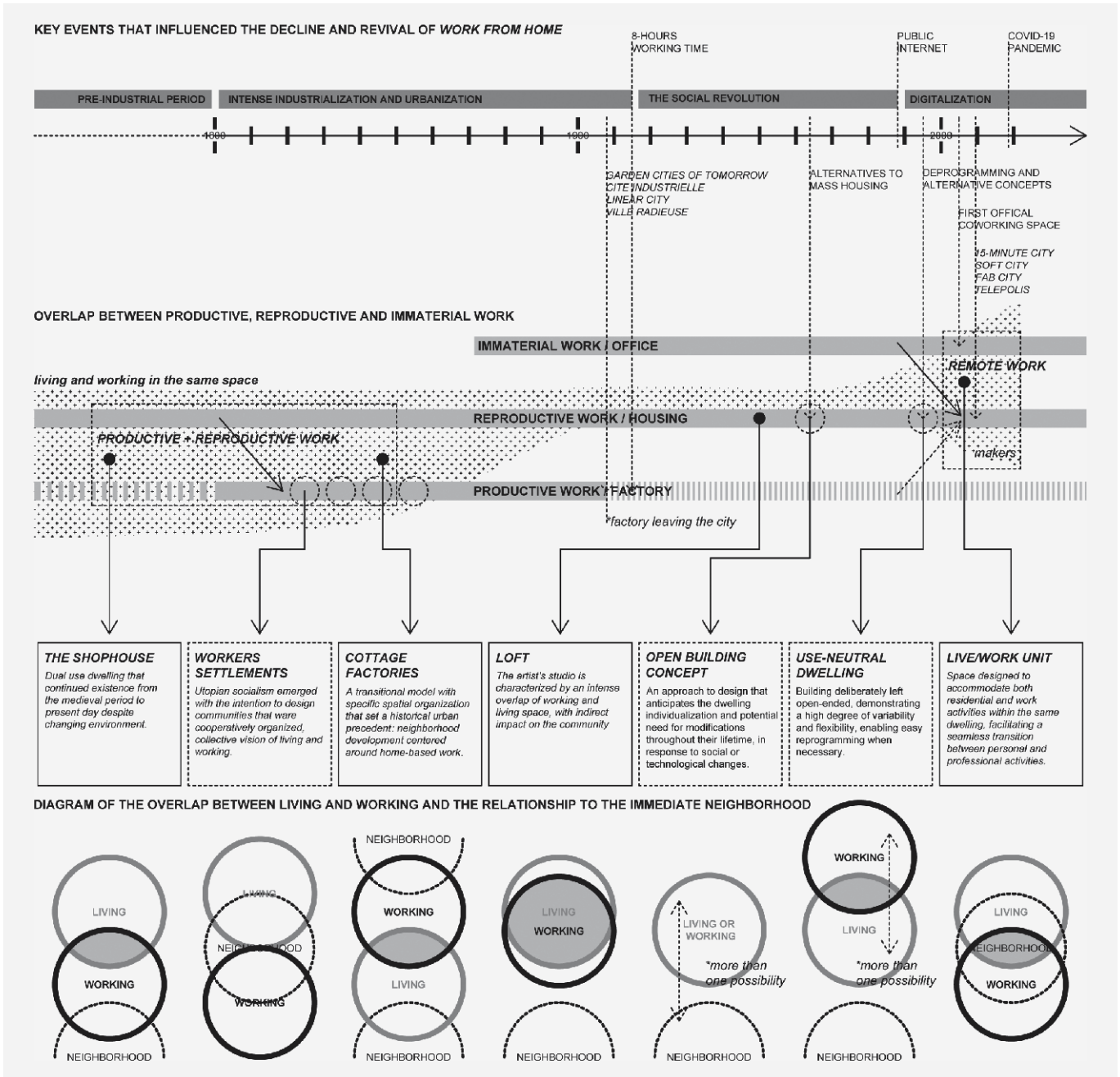

Fig. 1 Historical overview of key events that influenced the decline and revival of work from home and recognized architectural models

Tamara Relić[1], Bojan Baletić[2]

[1] University of Zagreb, Faculty of Architecture, Fra Andrije Kačića Miošića 26, 10000 Zagreb, Croatia
https://orcid.org/0009-0005-9124-6165
[2] University of Zagreb, Faculty of Architecture, Fra Andrije Kačića Miošića 26, 10000 Zagreb, Croatia
https://orcid.org/0009-0008-7011-4798

trelic@arhitekt.hr
bbaletic@arhitekt.hr

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Dual-Use Dwellings – Historical Overview

DUAL-USE DWELLING
LIVING/WORKING
MULTI-RESIDENTIAL DEVELOPMENTS
WORK FROM HOME

The COVID-19 pandemic in 2020 forced many employees to work from home, and since then, remote work has remained a prominent topic. From an architectural point of view living and working in the same space is a complex issue that challenges the boundaries between private and shared spaces, productive and reproductive work, the home and the city. To address how workspaces can be integrated into residential buildings today, examining the historical background of dual-used dwellings is essential. This paper analyzes historical forms of *work from home* settlements and purposely built dual-use dwellings, with a focus on identifying their basic characteristics, the degree of overlap between living and working spaces, and their relationship with the immediate surroundings. The results show three historical types of dual-use dwellings: integrated into the neighborhood, within the building community, and in the housing unit. With the digital revolution, the high demand for remote work jobs, and a growing interest in work-life balance, it is evident that there is a growing need for further research on the integration of dual-used dwellings within multi-residential developments.

INTRODUCTION

The dwelling serves as a reflection of society and the lifestyle of its inhabitants. As progress unfolds, evolving life patterns drive modifications in the design and functionality of living spaces. The digital revolution has significantly reshaped how we live, work, and communicate further influencing these developments. With the rise of the Internet and smartphone usage, the relevance of physical distance has diminished, enabling virtual connectivity. This has led to the creation of new living patterns, where family life, work, and leisure increasingly overlap (Junestrand, Tollmar, 1998; Fig. 2). Consequently, a growing number of individuals now work from home, with flexibility and mobility emerging as the most desirable attributes.

Since the start of this research, the COVID-19 pandemic has occurred, prompting a major shift towards remote work. In 2017, only 5% of the European Union's working population regularly worked from home. However, due to the pandemic, this figure sharply increased to 37% by 2020 (López-Igual, Rodríguez-Modroño, 2020). The percentage has since decreased but remains higher than pre-pandemic levels, especially in countries with good digital infrastructure, suggesting that remote work is here to stay (Judes *et al.*, 2021). A DW News article on Europe's attitude toward remote work, published in 2022, reported that three out of four people wanted to continue working remotely (Beardsley, 2022). COVID-19 accelerated the adoption of remote work and exposed its challenges and potential benefits. During this trial period, it was noted that a rise in remote work could reduce urban congestion, lower CO_2 emissions, and offer employees more free time and a better work-life balance (Bonenberg, Lucchini, 2022). To achieve these positive global effects, it is important to establish the potential of integrating workspace in multi-residential buildings. Living and working in the same space is a complex problem that questions the border between private and shared space, between productive[1] and reproductive work, between the home unit and city, and has the potential to become a new community generator.

THE PHENOMENON OF 'WORK FROM HOME'

Remote work today is largely defined by information and communications technologies (ICT) that enable a seamless workflow regardless of the work location. *Work from home* is part of remote work that is happening at the employee's home. In this context, working from home can be divided into two main categories: home-based business and teleworking (permanent or occasional).

The first category refers to business entities registered or operated from the owner's residential address, comprising an average of 15% across the EU (Reuschke, Domecka, 2018: 8). Examples include freelancers such as writers, designers, consultants, or owners of online stores. Such businesses often require the use of computers, the Internet, and other technologies for managing business activities, communicating with clients, and handling finances.

Teleworking involves working for an employer either permanently or occasionally from a location outside of the traditional workplace. According to 2015 statistics, 20% of employees engaged in telework[2], with this number steadily increasing (Eurofound and the International Labour Office, 2017: 15). Following the COVID-19 pandemic, these figures doubled. "Early estimates from Eurofound (2020) suggest that close to 40% of those currently working in the EU began to telework full-time due to the pandemic. A recent JRC study provides a rough estimation of around 25% of employment in teleworkable sectors in the EU as a whole." (Milasi et al., 2021)

Both categories are predominantly represented in knowledge-based sectors, such as information and communication, construction, business services, and creative industries. Individuals aged 19-21 account for 21%

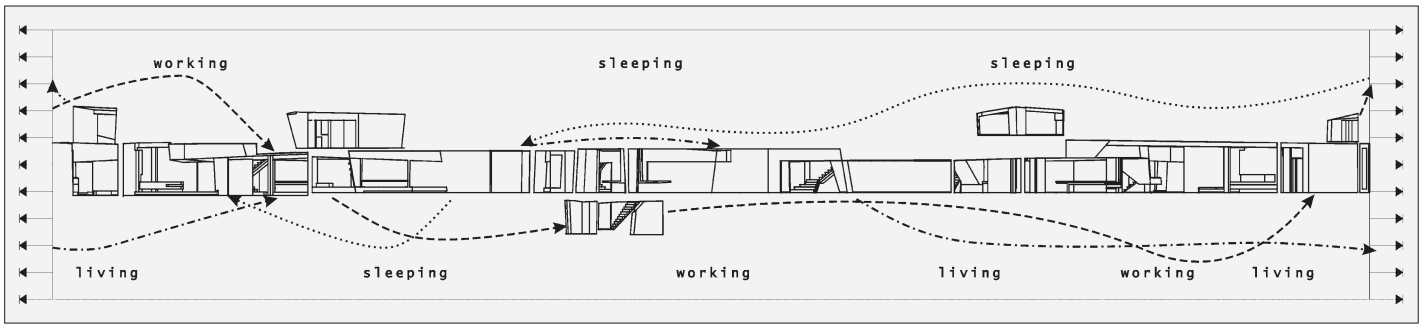

Fig. 2 Van Berkel, B.; Bos, C. / UN Studio (1993) Mobius House, Het Gooi – diagram of the interconnected path of the loop that reflects the family's 24-hour routine of living and working

of these sectors (Reuschke, Domecka, 2018: 11). These sectors also demonstrate a trend toward increasing their share of the workforce (Judes *et al.*, 2021). These forms of work are often associated with mobility, flexible job structures, and temporary employment. Both categories rely on advanced technologies that enable remote communication, collaboration, and access to information.

Commonly cited advantages include reduced labor costs, improved work-life balance, flexible working hours, adaptable childcare arrangements, and the elimination of commuting time (Holliss, 2012; Lipnjak, 2012; Bonenberg and Lucchini, 2022). However, many new remote workers faced inadequate home setups and additional responsibilities such as childcare during the COVID-19 crisis, which posed significant challenges (Milasi, 2021: 15). Commonly highlighted problems, regardless of the pandemic, include social isolation, limited space for meetings, and a generally weak social and professional network (Holliss, 2012: 24). Research from various accredited institutions has produced mixed results regarding the impact of remote work on productivity, with some studies indicating that employees in hybrid work environments are the most productive, while others challenge these findings (Bradshoe, 2024; Bloom et al., 2015: 181).

Analysis of previous research on the topic from an architectural point of view has established that the idea of living and working in the same space is not a novel concept; it has well-established historical precedents. The most significant contribution to the topic was made by Frances Holliss, whose primary objective in her doctoral thesis was to establish the "workhome", as she calls it, as a building type (Holliss, 2007: 101). She documented its continued existence, mostly in single-family homes, from the medieval period to the present day in England. A different perspective on the topic was provided by Aureli and Tattara, who explored through research and design theoretical architectural models of cooperative housing based on the overlap of living and working spaces (Aureli, Tattara, 2018, 2022). Architectural research conducted during the COVID-19 pandemic, focusing on the use and spatial organization of homes during mandatory remote work, pointed out privacy issues (McGee et al., 2023: 99), the lack of space (Kuropka, 2022), and that spatial organization and adaptability of space are the most important factors for satisfaction with working from home (Bonenberg, Lucchini, 2022). There is a lack of architectural research that systematically focuses on the integration of dual-used dwellings within multi-storey residential buildings.

Methodology and Scope of Paper

This research is part of doctoral research[3] focusing on *work from home* from an architectural point of view and its integration within the context of multi-storey residential buildings. To address how workspaces can be integrated into residential buildings today, this paper aims to describe and characterize historical models of dual-used dwellings with a specific interest in historical *work from home* settlements and purposely built dual-use dwellings in multi-storey buildings as a more complex form of living together.

This paper considers that researching historical examples of *work from home* within the socioeconomic context of their time is the

1 The terms productive and reproductive labor have been extensively described in economic theories of capitalism. Productive labor involves activities through which we earn a living. Reproductive labor includes activities such as sleeping, eating, cooking, cleaning, and household maintenance – tasks essential for life but not remunerated. Together they constitute 'vita activa', as described in the book The Human Condition, by Hannah Arend (Aureli, 2011: 99).

2 Approximately 9% of these employees regularly or frequently worked from home, while 11% worked from home more than once a week (Eurofound and the International Labour Office, 2017: 15).

3 First author's ongoing research for the Ph.D. thesis *Architectural criteria for the integration of home-based work in residential buildings*, at the University of Zagreb Faculty of Architecture, with the second author as a mentor.

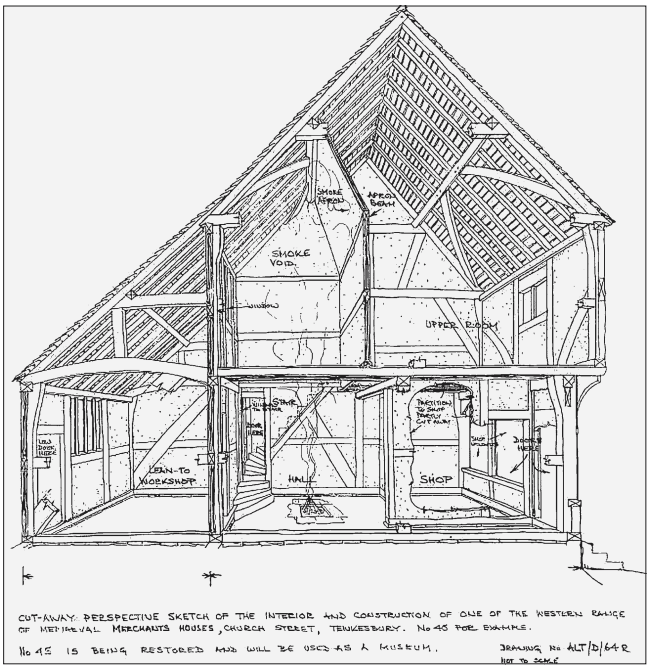

Fig. 3 Drawing of the medieval merchant's house. At the front of the building, the shop features tilting shutters that close securely at night and tilt outward in the morning to create both a shop window and counter.

first step to exploring contemporary trends in home-work integration. The analysis of examples is presented chronologically, and conceptually divided into 4 historical periods, according to the tendencies in which each example emerged: the preindustrial period, the period of intense industrialization and urbanization of the 19th century, the period of social revolution of the 20th century, and current tendencies in the time of the digital revolution. The examples are analyzed through 3 groups of criteria with a focus on identifying their basic characteristics: the degree of overlap between living and working spaces, the privacy level of living space, and their relationship with the immediate neighborhood. The data collected is systematized to determine the types of relationships between work and home through history. The results obtained from researching historical examples will contribute to understanding the complex relationship between living and working in contemporary projects.

Decline and Revival of 'Work from Home'

Historically, dual-used dwellings were shaped by necessity and practicality, often dictated by technological limitations and economic considerations. A comparative analysis of examples with integrated workspace, within the socioeconomic context of their time reveals four phases of the observed relationship, corresponding to the following historical periods:

The Pre-Industrial Period

Before the first Industrial Revolution, most people were part of self-sufficient and self-sustaining communities where productive and reproductive work overlapped. Productive work was not confined to specific working hours. Most people engaged in primary activities that they conducted from their homes or nearby. Individuals participated in the production process from start to finish, selling or bartering their products.

The merchant's house (Fig. 3) is the oldest form of a home-based workspace, originating from the pre-industrial era. Similar forms emerged simultaneously in different cultures. This global phenomenon, as Howard Davis refers to it, primarily occurred due to the technological limitations of the pre-industrial revolution period and the financial practicality of such spatial organization (Davis, 2012: 11-14).

In medieval, three types of houses were characteristic: the peasant longhouse, the manor house, and the merchant's house. According to Holliss, all three types combined living and working spaces. The English merchant's house has had the clearest distinction between living and working space including living quarters, production areas, storage, and a shop (Holliss, 2007: 113). The traditional Japanese house did not strictly separate residential and commercial functions. The traditional Kyoto townhouse, or *machiya*, is a long and narrow structure, no more than two stories high. Its spatial organization is similar to Western row houses. If the house included a workshop or craft area, it was in the room closest to the street. During working hours, the front space was separated to maintain the privacy of the residential area, and later, the space was combined with the second room to serve as a living area (Davis, 2012: 15-23). Similar principles are evident in the traditional houses of Bangkok, China, and Singapore.

The shophouse, as Holliss refers to it, is the specific type of dual-use residential space that was known through medieval as well as today (Holliss, 2007). Differences in the examples indicate that the recognized issues of dual space usage, such as the intersection of commercial and residential users and the need for privacy, are addressed with varying degrees of spatial flexibility, depending on the culture in which they develop. This spatial organization has persisted in family houses to this day.

4 "Capitalism … acknowledges productive labor for the market as the sole form of legitimate 'work,' while the tremendous amount of familial as well as communitarian work that goes on to sustain and reproduce the worker, or more specifically her labor power, is naturalized into nonexistence." (Murrillo, D'Atri, 2018)

The Period of Intense Industrialization

The 19th century was marked by industrialization and urbanization. Individual crafts were replaced by manufacturing, factories were built, and the previous economic and social order underwent significant changes. The demand for a large workforce in factories led many to abandon home-based work and seek employment in factories in bigger cities. Simultaneously, the relationship between individuals and work has changed. Workers no longer controlled their work hours; these were determined by employers. Productive work became predominantly a male responsibility, while reproductive work remained within the female domain. This shift began with manufacturing and intensified with mechanization, leading to a division of labor where multiple workers performed different parts of the production process (Rappaport, 2019: 41-45). Consequently, workers became parts of a process, repeating specific tasks without overseeing the entire product, and workspaces and living spaces became spatially separated. Industrialization led to an unprecedented migration of job seekers to the factories in the rapidly growing cities (Heckmann, Zapel, 2017: 14).

As a response to the miserable living conditions in industrial areas, Utopian socialists emerged with the intention to design communities that would foster equality, cooperation, and improved living conditions. Building **workers' settlements** such as Familistere, Guise (FR) established by Jean-Baptiste André Godin, a follower of Charles Fourier, a social utopian thinker, were designed. Inspired by Fourier's phalanstćres (self-contained communities), Godin created a living and working complex for his workers at the Godin stove manufacturing plant. The Familistćre combined residential units, workspaces, and communal facilities in one complex, reflecting the idea of integrating all aspects of life. A similar approach was taken by Robert Owen when he moved to Indiana and purchased New Harmony (Fig. 4) in 1825. He aimed to transform it into a model utopian community based on his social and educational reforms (Rappaport, 2019: 74). New Harmony was Owen's most ambitious community, but it was never built.

The other significant projects for the discussion on dual-use dwellings are the **cottage factories** projects in Coventry, England, which emerged in the mid-19th century. These projects provided a compromise between home-based work and factory work, offering a unique model of neighborhood development centered around home-based work (Holliss, 2015: 142). In the case of Eli Green's cottage factory from 1858 (Fig. 5), three residential rows formed a triangular block organized around a power source. Each residential unit included living spaces on the lower floors and a workspace, specifically a weaving room, on the uppermost floor. The workspaces of all units were interconnected by a drive mechanism that powered the weaving looms. The central area of the triangular block served as a communal space for all residents, accessible from the street through a few passages. Each residential unit had street-side access and an exit to the shared central space. The private living spaces were graduating toward the public space through a small semi-private outdoor area. It represents a transitional model with a specific spatial organization that sets a historical urban precedent for collective housing projects that incorporate home-based work and emphasize the importance of community.

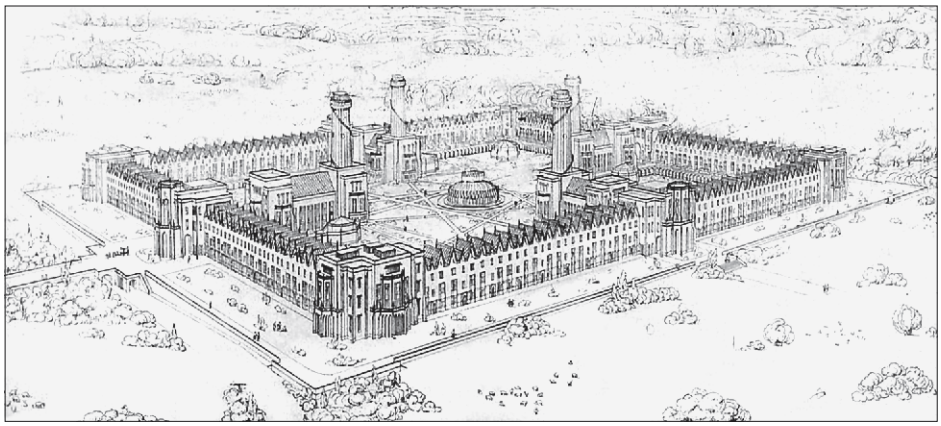

Fig. 4 "Artists impression of Robert Owen's ideal for New Harmony" by The JR James Archive, University of Sheffield, drawing of unbuilt utopian community combining residential units, workspaces, and communal facilities in one complex

The Social Revolution in the 20th Century

Productive and reproductive work began to diverge in the 19th century with industrialization, and this separation was cemented by capitalism.[4] At the time the first commercial

Fig. 5 Eli Green's cottage factory, built 1858: multiple home-based work dwellings arranged around the power source, photography made in the 1970s before the demolition of the estate

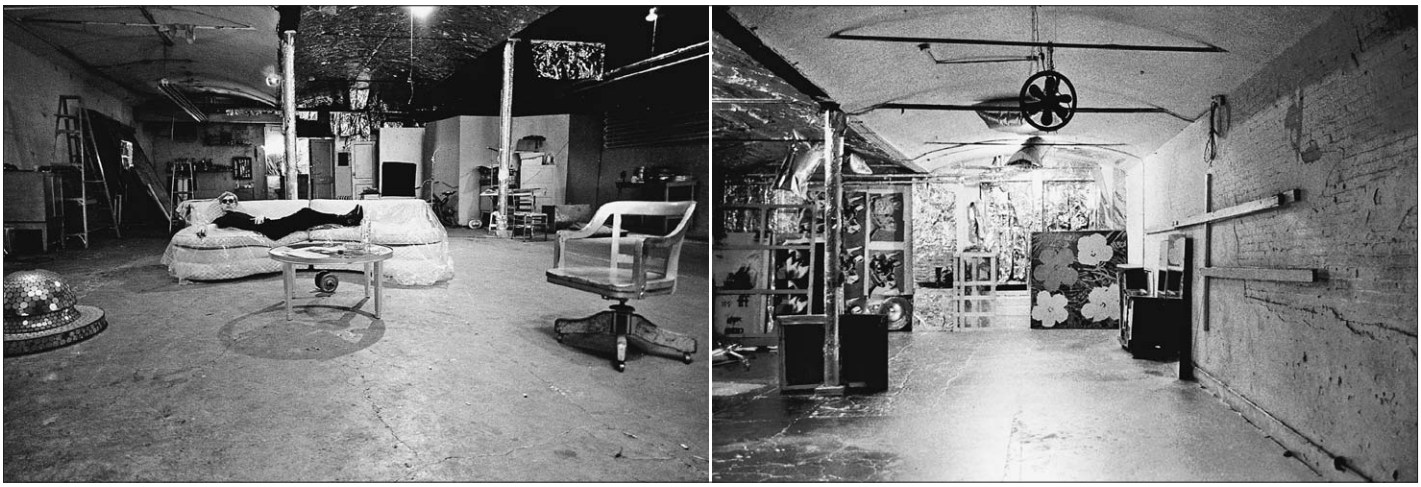

Fig. 6 Andy Warhol's project "The Silver Factory"

offices appeared as part of industrial complexes. New technologies of the early 20th century (telephone, telegraph, typewriter, elevator) allowed the offices to be situated away from the factory and make their own architectural type development through the 20th century (Caruso, 2014: 122) creating a space frame for immaterial[5] work.

New urban planning doctrines of the 20th century directed city development in two opposing directions: the low-rise railway-depending city, derived from the Garden City concept[6] by Ebenezer Howard (Rappaport, 2019: 83), and the high-rise city, from Le Corbusier's Radiant city concept. In the former, residential purpose shapes the typology of houses with gardens, while in the latter, it promotes residential towers as 'machines for living', surrounded by vast open green spaces, aiming to maximize sunlight and air circulation, and providing residents with direct access to nature. The CIAM, an international institute promoting new architectural ideas, advocated for functional zoning in cities, proposing that social problems in large cities can be resolved through strict functional segregation. Le Corbusier encapsulated residential neighborhoods into single architectural entities containing all necessary amenities, thus freeing up surrounding space (Rappaport, 2019: 95, 112). What both directions have in common is zoning out the industrial zone which resulted in spatial as well as social segregation of Modern city (Holliss, 2007: 203-209). A focus has shifted to mass housing and dual-used dwellings were marginalized in line with new social and economic values. They have developed further as individual housing or artist ateliers within the residential buildings.

The Prellerhaus, a five-story part of the Bauhaus complex in Dessau from 1926, is often mentioned for its design, but less so for being a set of 28 dual-used dwellings, **studios** for young masters and students with an interestingly high share of workspace in the living space (Levy Bencostta, 2023: 60-64). The building complex also included communal spaces on the ground floor and basement, while each studio was dedicated to individual work and sleeping.

The true flourishing of the coexistence of living and working in art occurred after Andy Warhol's project "The Silver Factory," realized in 1953 in New York (Fig. 6). Aureli and Tattara are considering this moment as the starting point for 'work/live' type of housing (Aureli, Tattara, 2022: 40). Warhol perfectly embodied the spirit of the times by blending the stark modernism of the Bauhaus with the intense individualism of romanticism. His choice to name his studio 'The Factory' was deliberate, serving both as a homage to and critique of mass production, while also reflecting the studio's actual industrial origins (Pratt, 2012: 25-31). Living and working in **the loft** overlapped in most parts of the housing unit, and the privacy of living space is defined by the user. The social life of artists[7] is appealing to others who wish to be part of, or connected to, the artistic scene. This is an urban phenomenon in which artists often oc-

5 In Marxist economic theory, cognitive work is classified as immaterial labor. The term "immaterial labor" was introduced by Italian sociologist and philosopher Maurizio Lazzarato in his 1996 essay, *Immaterial Labor*. This concept encompasses all knowledge-based work derived from affective and cognitive activities. In the context of the internet, immaterial labor is commonly linked to themes such as digital labor, commons-based peer production, and the creation of user-generated content. (Terranova, 2000)

6 Many other utopian concepts formed in the same period such as Cite Industrielle by Tony Garnier in 1917 (Rappaport, 2019: 76) and Linear City by Spanish engineer-planner Arturo Soria y Mata in 1882 for Madrid (Rappaport, 2019: 107).

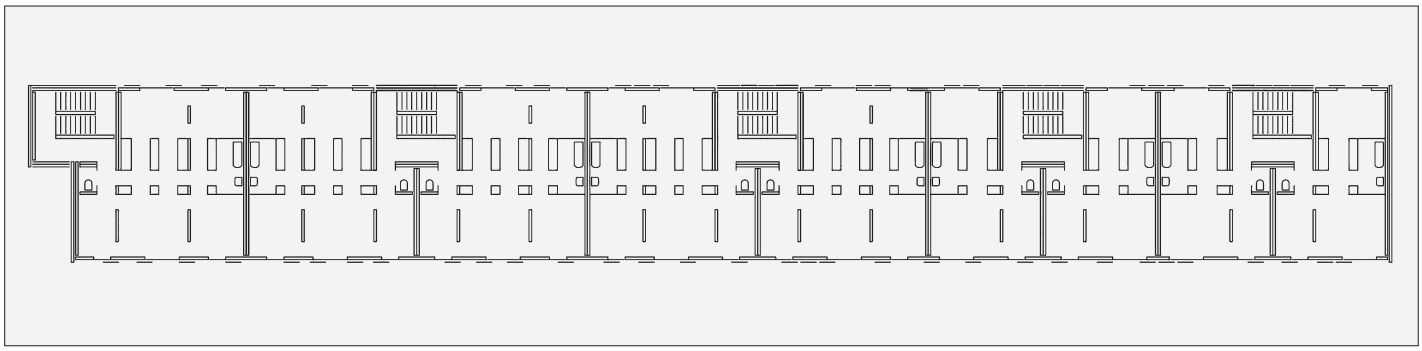

Fig. 7 Typical floor plan of Housing in Graz (1994) by Riegler & Riewe. The apartments have a three-layered floor plan: the middle strip is designed as a service zone, and the outer layers are rooms without determined function.

cupy abandoned industrial spaces due to affordable costs, or even squat in them, gradually driving positive changes (Pratt, 2012; Aureli, Tattara, 2022: 41) and having an indirect impact on the neighborhood. In the post-studio era[8] traditional studios are being replaced by flexible, multifunctional spaces or even virtual environments that enable creativity without physical limitations (Lockhart Milan, 2023: 267). This shift also reflects broader social changes toward mobility, connectivity, and decentralization in the contemporary world.

During the 1960s and 1970s young architects questioned the current practices in mass housing and alternative concepts were developed with a focus on individualization and diversification in housing (Heckmann, Zapel, 2017: 28-30). N.J. Habraken's "Supports: An Alternative to Mass Housing" (1962)[9] emphasizes the importance of creating a framework or "support" for living spaces that enable personalization and adaptation. Habraken's **open-building** ideas have significantly influenced discussions on architecture, urban planning, and the design of housing, promoting a more user-centered approach to build environments. He did not initially consider remote work as a function at home; however, it is significant to the paper because the design approach allows easy adaptation for remote work as well.

As discussed in *Frame and Generic Space* (Leupen, 2006: 18), the traditional approach to design presents a paradox: the more precisely a dwelling's requirements are defined at the outset, the more likely it is to become misaligned with future needs. When architects focus on measurable aspects of living and translate them into a design, they often overlook the intangible and unquantifiable elements, leaving the design less capable of adapting to unforeseen changes in use (Leupen, 2013: 24).

Buildings like *Housing in Graz* (1994) by Riegler & Riewe (Fig. 7) are deliberately left **use-neutral**, demonstrating a high degree of variability and flexibility, thus enabling easy reprogramming when necessary (Leupen, 2013: 30; Heckmann, Zapel, 2017: 39). Although not considered dual-used dwellings per se, these concepts emphasize individualization in open but precise structure, and a high degree of variability of use, easily adapted to include *work from home* in possible scenarios.

By the end of the 20th century, housing had become increasingly diverse and multifaceted, prioritizing adaptability, flexibility, and personalization. A wider range of apartment sizes, layouts, and standards emerged to accommodate various lifestyles and income levels.

The same process of diversification happened with the development of the office. As Mozas described we have had *the fun office, the connected office, the hyperreal office, the adolescent office, office sweet office* that is trying to feel like home, and *the diverse office* (Mozas, 2014: 4-21) which can also be described as working anywhere without needing the office space.

The Digital Revolution of 21st Century

The second shift in housing perspective happened in the 1990s and early 2000s and represents a response to the dominance of modernist architectural principles that prevailed

7 The art scene at the time is characterized by a dual nature: social networks and gatherings on one side, and artists in profound isolation on the other.

8 This era began in the 1960s and 1970s, in the middle of shifts in artistic practices and the social circumstances of the time, creating opportunities for collaboration and interdisciplinarity, where art enters into dialogue with architecture, technology, social sciences, and urbanism.

9 Inspired by Habraken's concepts and the pioneer work of the SAR in the 1960s and 1970s, TU Delft, led by Professor Age van Randen, established the OBOM research group in the 1980s to address the practical challenges of implementing the Open Building approach. https://www.openbuilding.co/ (3. 9. 2024.)

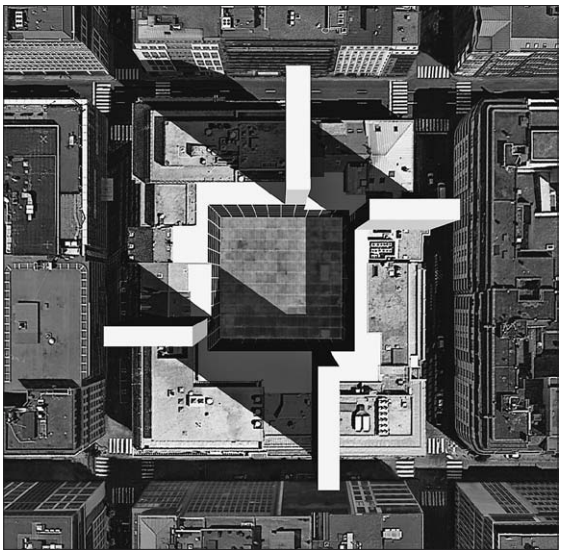

FIG. 8 DOGMA, PRETTY VACANT, 3D VISUALIZATION. TRANSFORMATION OF OFFICE SPACE INTO HOUSING IN THE QUARTIER LEOPOLD, BRUSSELS (BELGIUM), 2014. THE NEW HOUSING IS COOPERATIVELY ORGANIZED WITH LIVE/WORK UNITS. INDIVIDUAL SPACE IS MINIMIZED SO THAT ONE PERSON CAN LIVE IN IT COMFORTABLY, AND COLLECTIVE SPACE IS INCREASED TO CONTAIN THOSE FUNCTIONS USUALLY SQUEEZED INTO TINY APARTMENTS.

FIG. 9 RIKEN YAMAMOTO'S SHINONOME CANAL COURT CODAN HOUSING PROJECT, TOKYO, BUILT 2003. "THE MAIN CHARACTERISTICS OF THIS HOUSING DEVELOPMENT, BY RIKEN YAMAMOTO, ARE THE 'COMMON TERRACE' WHICH IS A VOLUME CARVED OUT OF THE RESIDENTIAL BUILDING, THE 'FOYER-ROOM' WHICH CAN BE USED AS A HOME OFFICE, SUNNY CENTER CORRIDORS, AND SUNNY BATHROOMS/KITCHENS."

in the 20th century. This shift introduced alternative models of living, such as co-housing[10], co-living[11], and cooperative building models[12], which emphasized the importance of community gathering as well as individualization and flexibility of personal living space. At the same time, the Digital revolution[13] has led to new forms of work where private life and work overlap (Fig. 8). Work is no longer confined to 8am to 5pm, Monday to Friday, but integrates various private and social relationships (Aureli, Tattara, 2015). This creates a need for new spatial forms for workspace and some of them were included in alternative models of living.

As noted by Aureli and Tattara, the rise of freelancers[14] has turned homes into work environments, with work being done at kitchen islands, dining tables, beds, or living rooms (Aureli, Tattara, 2022: 6).

In this context, residential space is becoming an epicenter of 'production' again in **live/work units**. This shift is possible not only because new technologies make work ubiquitous, reducing the importance of traditional workplaces but also because immaterial labor incorporates aspects typical of reproductive work, such as sociability, care, and attentiveness. Specific types of workspaces are once again becoming desirable parts of residential buildings (Fig. 9).

As the answer to raising questions placed on the role of communities and local networking in mitigating some of the negative effects of digitalization on the labor market (Dangschat, 2022: 150), there are few new urban planning concepts. Well-developed communities can absorb some of the growth in inequality caused by digital transformation. The most well-known is *The 15-minute city* where neighborhoods offer residents essential amenities – such as shops, schools, parks, leisure activities, and healthcare – within a 15-minute walk or bike ride (Papas et al., 2023: 546).

This concept gained worldwide recognition when Paris Mayor Anne Hidalgo made it a central part of her 2020 re-election campaign, advocating for pedestrian and cycle-centered urban design as the way forward. She was successfully re-elected. On a similar topic David Sim, the author of *The Soft City* concept, outlines the principles of layering and multi-functionality as particularly significant for the topic of *work from home*. The author emphasizes that such principles significantly increase the time available for personal needs by reducing the time spent commuting to work and fulfilling other obligations (Sim, 2019: 90). The concept of *Telepolis* by Javier Echeverría refers to a visionary urban model where advanced telecommunica-

10 Co-housing typically consists of individually owned homes or units, with residents owning their private spaces and sharing common facilities (like kitchens, dining areas, and recreational spaces). Focus is on creating a supportive, connected community where people can share resources, build social ties, and collectively manage shared spaces and responsibilities. (Medar, Ćurčić, 2021)

11 Co-living is a temporary housing model in which residents share living spaces, resources, and additional amenities while maintaining private areas, typically only bedrooms. It often targets young professionals, students, digital nomads, or people seeking a flexible, social lifestyle in urban settings. (Medar, Ćurčić, 2021)

12 Cooperative building models are conceived as self-managed projects based on collectively owned shares granting them rights to a specific unit. They are primarily focused on providing affordable housing, and some operate more like traditional housing complexes, while others are community-based and offer a

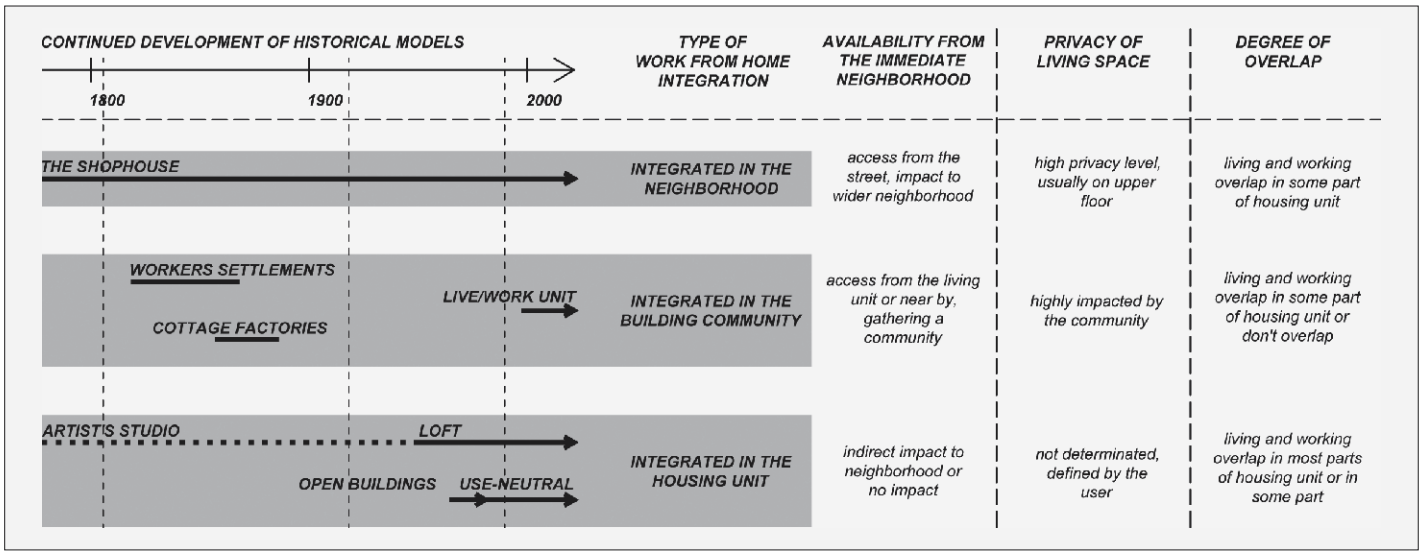

Fig. 10 Types of relationship between work and home through history

tions and digital technologies are seamlessly integrated into the fabric of the city. This integration aims to enhance urban living, optimize resources, and create a more connected and efficient urban environment. As author argues, in the near future homes will tend to be the workplace and cities the place of leisure (Gausa, 2003: 616). Collectively, these concepts and projects represent a shift towards more resilient and adaptable urban living, where working and living can seamlessly coexist.

Results and Discussion

Analysis of historical examples with integrated workspaces in the socioeconomic context of the time has identified a dependency between socioeconomic conditions and the development of various models of dual-use dwellings (Fig. 1). Throughout history, the concept of the dwelling has evolved alongside changes in the organization of work, from pre-industrial times when productive and reproductive activities coexisted within household units to the industrial era and 20th century marked by spatial separation of work and home. Seven models with specific characteristics, each emerging in a different period, were identified: *the shophouses* in the pre-industrial period, Utopian *workers' settlements* and *cottage factories* of the 19th century, *artists' studios* in the 1950s, *open buildings* in the 1970s, and *use-neutral dwellings* and *live/work units* in the 1990s and early 2000s.

The results of the research show that some of these dual-use dwellings, such as the shophouse and artists' studios, have continued to exist to this day, while others, like the cottage factories in Coventry, have remained in the past but established a historical precedent for contemporary projects. This home-based work community originally emerged around power sources in the 19th century, while contemporary examples, like live/work units, stem from the gathering around common interests.

Through comparative analysis of the basic characteristics of the layout of work and living spaces, the privacy of living spaces, the degree of overlap between living and working spaces, and the impact of the workspace on the immediate neighborhood, three types (Fig. 10) of relationship between work and home through history were identified: dual-use dwelling integrated into the neighbourhood (the shophouse), into the community within the building (cottage factories, workers' settlements and live/work unit), and into the residential unit (artist's loft, open building concept and use-neutral dwelling). A dual-use dwelling integrated into the neighborhood

various facilities including co-working spaces. (Baraona Pohl, 2017)

13 It started when the Internet in 1995 became publicly available. At the time production moved to China and developing nations, and Europe strategically transitioned towards building a robust knowledge economy, leveraging technology, innovation, and sustainable practices to drive growth and improve quality of life. The advantages of working with the assist of ICT (informational and communicational technology) allow individuals to temporarily change their work and living locations throughout the year, connecting leisure with utility by utilizing different geographical locations for climatic differences or cultural needs.

14 A freelancer is a self-employed individual who provides services to clients on a project-by-project or contract basis. Their work arrangements can vary greatly – from remote and flexible, often seen in digital and creative fields, to on-site, where physical presence is required.

has direct access to the workspace from the street and an impact on the wider area. The living space is more private, and the overlap of residential and workspaces occurs in a smaller part of the residential unit. Dual-use dwellings integrated into the building community share a common goal of creating an active community around a shared interest, despite varying levels of overlap between work and living spaces at the unit level. Dual-use dwellings integrated into the residential unit are often characterized by an intense overlap of work and living spaces; however, the level of privacy of the living spaces cannot be determined with certainty and depends on the user. Although studio lofts often do not have direct contact with the street and immediate neighborhood, they have historically influenced neighborhood formation through their strong gravitational pull.

Conclusion

This paper has analyzed historical forms of *work from home* settlements and purposely built dual-use dwellings, with a focus on identifying their basic characteristics, the degree of overlap between living and working spaces, and their relationship with the immediate surroundings. The conducted research has shown that the intertwining of living and working spaces has a rich historical background, reflecting shifts in societal norms, economic structures, and technological advancements. The results show three types of relationship between work and home through history: integrated into the neighborhood, within the building community, and in the housing unit.

The results of the research on historical examples will contribute to a better understanding of contemporary concepts of *work from home*. Recognized types of relationship between workspace and residential space in historical dual-used dwellings will contribute to further research of criteria for the integration of workspaces in multi-storey residential buildings.

With the digital revolution, high demand for remote work jobs after the COVID-19 pandemic, and the rise of interest in work-life balance, it is evident that there is a growing need for architectural research on the integration of dual-used dwellings within multi-residential developments.

[Proofread by Branislava Pogačić]

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Authors' biographies and contributions

Tamara Relić, Ph.D. candidate and teaching assistant at the University of Zagreb Faculty of Architecture. Her scientific interest is focused on challenges and possibilities in housing.

Prof. **Bojan Baletić**, Ph.D., is a full professor and Dean of the AF (2020-24). He teaches at the Unit for Digital design technologies which he founded in 1995. His research interests are housing design, digital technologies, artificial intelligence, campus planning and urban regeneration. In 2018 he was presented the Croatian National Science Award. From 2006 to 2014 he served as vice rector at the UniZG. In 2005 he was recognized by the UniZG for promoting international cooperation.

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Fig. 1 A view of the learning space in Bielefeld Laboratory school, which is an example of open learning landscape architectural design

Barbara Horvat

Univerza na Primorskem, Pedagoška fakulteta, Università del Litorale, Facoltà di Studi Educativi, Cankarjeva 5, 6000 Koper, Slovenija
https://orcid.org/0000-0001-7462-9504

barbara.horvat@pef.upr.si

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School Learning Space from the Perspective of Pedagogical Paradigms

ARCHITECTURAL CONCEPTS
LEARNING SPACE
PEDAGOGICAL PARADIGMS
PEDAGOGY
SCHOOL

The article examines the interior of school learning space in the German-speaking and southern part of the Nordic region from the 19th century to the present day. Through the review of sources, analysis of primary sources, and images, school learning space has been explored in relation to established pedagogical paradigms, Herbartian and Reform Paradigms, in terms of how they perceive teaching and learning process. In the 19th century, in line with a standardized teaching process, school learning space was relatively simply organised, with an orderly structure and rows of desks. With the emergence of Reform educators at the turn of the 19th to the 20th century, with a focus on teaching that catered to the needs and interests of students, school learning space acquired multiple roles and became the basis for the current understanding of school learning space. In Dewey's concept of ideal school, a conceptual origin of modern architectural designs of school learning space can be recognised. Based on the analysis of these designs from the perspective of current trends, particularly communication pedagogy, it can be concluded that a constructive school learning space requires an open area that does not isolate students. Open questions for further research into school space have been indicated.

INTRODUCTION

School space has always posed one of the most important questions and challenges for every society, as it represents the place where young people adopt culture, values, norms, and, in general, their future destiny. Each society has approached the issue of school learning space in its own way, depending on the historical period, and has shaped its own system of school organization, which has changed and reformed over time. Nevertheless, some European countries preserve their own traditions to a greater extent (e.g. England) since they derive from different values and a different concept of school space (e.g. Skubic Ermenc, 2018: 76).

In Europe, for instance, regarding the design and organization of schools, a seemingly obvious difference can be observed between the countries located in the north and those situated in the south of the continent. Based on literature (for instance: Hubeli et al., 2019) and several school visits, it can be concluded that the former exhibit relatively more diverse spatial arrangements, characterized by various learning and teaching spaces, including areas for relaxation, exploration, and study. At the same time, it can be recognized that in northern countries, "traditional" elements like hallways, dining areas, and libraries seem to be disappearing as these spaces, similar to the areas for learning and teaching, are understood as multifunctional areas within the school (Figs. 1, 7-10) (Chiles, 2015; Hubeli et al., 2019). The above-described changes to the school space interior are justified by arguments that schools designed, renovated, or newly built are thus more suitable for contemporary needs. In today's world, where children and teenagers spend their entire days at school, the focus is on respecting individual human rights, interests, needs, and values. The emphasis is on freedom of thought and beliefs, as well as the necessity to adapt to the continuous changes in our rapidly developing, technologically advancing society (Hubeli et al., 2019: 10-281).

In this text[1], we shall start from the assumption that the concept of the school learning space depends on the established pedagogical paradigms. Pedagogical paradigms shall be understood as pedagogical thought, or more precisely, how a certain pedagogical thought defines the structure of the educational process, the relationship between educational factors and to which of them – teacher, contents, environment and student – "it ascribes a key role in educational impact" (Medveš, 2015: 14). We shall refer to Medveš's (2015) classification of pedagogical paradigms, as this is the author's essential preoccupation. For the period from the 19th century onwards, he distinguishes four basic paradigms: Herbartian, Cultural or Spiritual, Social-Critical and Reform Pedagogical Paradigm.[2]

To date, relatively few texts have been published in the field of architecture on the issue of the interior of school learning spaces. Among them, studies dealing with the past or history, current times (e.g., Bobovec, Matković, and Rako, 2020), and the hidden curriculum stand out (e.g., Roth-Čerina and Cavallo, 2020). Conversely, in the pedagogical field, we notice a relatively large number of publications on the topic. However, besides examining it from a historical perspective, authors primarily focus on the desires and viewpoints of teachers and students regarding the school space. In the last two decades,

1 The text represents one of the results obtained within the framework of the Target Research Program "CRP 2021" titled *Guidelines for the Quality Design of Contemporary School Architecture to Support Comprehensive Sustainable Living and Work in Schools*. The project was conducted by the Faculty of Architecture at the University of Ljubljana, with co-implementers from the Faculty of Education at the University of Primorska and the Faculty of Sports at the University of Ljubljana.

2 Since the terms "Direction" and "Pedagogy" are also used, as in the Pedagogy of Herbartianism and the Pedagogy of Reform, the term Pedagogy (Herbartian Pedagogy, Reform Pedagogy) will be used to enable easier reading, even though it is narrower in meaning. Where this is not possible and a broader term for pedagogical thinking is needed, the term paradigm will be used.

there has also been a focus on the topic of the so-called inclusive learning spaces in both schools and kindergartens (e.g., Zenke, 2016, 2018).

However, there are relatively few contributions in the educational field that address the interior of the school learning space on the basis of pedagogical paradigms. In the article titled *Concept of Learning Space According to Pedagogical Paradigms in Terms of Analysis of Photographs*, published in 2018, the author (Horvat, 2018) establishes the link between a particular pedagogical paradigm and the conception of school learning space through existing photographs. An in-depth theoretical discussion of each paradigm is not included in the text, as the underlying purpose is to show the relevance of photographs for pedagogical research. This is followed by a paper published in 2019 (Horvat) entitled *Learning Space According to Pedagogical Paradigms*, in which the concept of school learning space is more thoroughly discussed, however, only from the perspective of Herbartian Paradigm.[3] Specifically, from the perspective of the Reform Pedagogy, the paper *The Learning Space of Volksschule Graz Mariagrün from the Pedagogical Perspective* was published in 2022 (Horvat), which presents a case study of one of the Austrian public schools operating according to the Jena-plan Reform concept.

This paper builds on the existing findings and examines school learning space from the perspective of the Herbartian Paradigm and the Reform Paradigm, with the emphasis on the latter paradigm.

The former one was chosen since it was supposedly universal, and dominant, in much of Europe in the 19th and early 20th centuries, while the latter represented a significant change in Pedagogy, and a starting point for the fundamental pedagogical thought that is still prevalent in much of Europe today, alongside Socio-Critical Pedagogy.[4]

Drawing on the Pedagogy of Herbartianism, the conceptual origins of some contemporary architectural concepts of the school learning space shall be sought, the so-called classroom plus, the cluster and the open learning landscape, as well as the connection between them and the understanding of the learning process in terms of how it is supposedly established through these spaces.

The aim is to establish a conceptual basis of some contemporary architectural concepts of the interior of the school learning space, the classroom plus, the cluster and the open learning landscape, which remain to be more thoroughly researched. We have also not yet seen in any source or literature how the highlighted contemporary architectural concepts of school learning space – the classroom plus, the cluster and the open learning landscape – could be understood and assessed from the perspective of one of the most current pedagogical theories, Communication Pedagogy, which is gaining recognition as a pedagogical field in its own right.

This article attempts to answer the following fundamental questions:

– Which pedagogical ideas are originally referenced by some of the most current architectural concepts of the interior, more "openly" designed learning spaces in schools – the classroom plus, the cluster and the open learning landscape?
– What has been the development of school learning spaces from the perspective of pedagogy or pedagogical paradigms in the German-speaking and partly southern regions of the Nordic area (especially in Austria, Germany, and partly in Denmark)[5] since the 19th century, i.e., since the period when the first reforms towards greater openness in education in general emerged?
– How is school interior learning space defined through the pedagogical paradigms of Herbartianism, Reform Pedagogy in terms of understanding the learning process?

The interior of the school learning space, which in this paper is limited to the space primarily dedicated to learning and teaching in the classroom or department has been studied. From an architectural point of view, the classroom has been focused on, while from a pedagogical point of view, the emphasis has been placed on the learning process, or how teaching and learning are established in the so defined space, according to Herbartian and Reform Pedagogical Paradigms.

The analytical-descriptive and analytical-interpretive methods have been used. The former is characterised by learning about the characteristics of the phenomena under

3 This article does not provide a detailed analysis of the conditioning of the school learning space from the point of view of the Spiritual and Reform Paradigms. From the perspective of the latter, the correlation between the prevailing paradigm and school learning space is only illustratively indicated through Montessori and Waldorf Pedagogy.

4 Socio-Critical Pedagogy is fundamentally concerned with the question of how to make schools work justly, so that the social and material environment of students does not have a fatal impact on their future. An analysis of the internal school learning space from the perspective of this paradigm will not be conducted in this article, but it might be attempted in more detail in another paper.

5 The project group members chose primary school concepts from Austria, Germany and Denmark as target groups for studying architecture concepts of schools.

study and examining possible causes and connections between phenomena. Descriptive analysis focuses on generalisation and the search for important common features of similar and different phenomena (Mužić, 1999: 49-50). The analytical-interpretive method, on the other hand, attempts to develop theoretical concepts through processes of comparative analysis and theoretical synthesis (Strauss and Corbin, 1994). Drawing on available articles, both methods have been used to analyse primary sources, images and plans, using deductive and inductive modes of reasoning.

The text is theoretical in nature and divided into two parts. The article searches for and presents the reasons why certain characteristics of school learning space have become established in a certain pedagogical paradigm and explains how the conception of the interior of school learning space depends on the perception of education and the learning process (organisation, design, furnishing). The first part focuses on the period from the 19th century to the transition from the 19th to the 20th century, and the second part on the beginning of the 20th century onwards.

PEDAGOGY AND SCHOOL LEARNING SPACE FROM THE 19TH TO THE 20TH CENTURY

The question of when and on what conceptual foundations the changes towards more open school spatial designs first emerged is a complex one, as it concerns the difficulty of defining the origin of the so-called reform pedagogical ideas for which unambiguous answers still remain to be found.

According to the prevailing consensus in the field of Pedagogy, these ideas gained prominence at the turn of the 20th century and are associated with a group of the so-called reform educators. The most prominent among them include John Dewey (experimental teaching and experiential learning), Maria Montessori (scientific Pedagogy), Rudolf Steiner (education for the spiritual renewal of humanity, Waldorf education), William Kilpatrick (project-based method), and Peter Petersen (Jena plan, group teaching). All the above authors, despite their differences in approach, advocated for significant changes in the established Pedagogy and education approaches of their time; some of them as early as in the 19th century. All of them tried to achieve a radical shift in the approach to children and children's rights, a focus on greater authenticity in the teacher/educator-student relationship, increased directness in education in general, greater tolerance for a child's self-development, less content, programme and didactic formalization, and an emphasis on more spontaneity, if not outright improvisation, in the educational process (Medveš, 1992: 1-3). Their aspirations were so radical that they introduced an entirely new pedagogical direction, known as Reform Pedagogy.

However, Oelkers (w.d.) argues that the first progressive pedagogical ideas emerged in the mid-19th century in Prussia, a significant world power at the time and the birthplace of Pedagogy. From there, they supposedly spread "to other European countries, both to the west and to the east" (Skubic Ermenc, 2018: 9). As emphasized by Oelkers, it was during that period that a great deal of criticism was directed towards the Prussian education system, namely that classrooms were overcrowded (Figs. 2 and 3), unrealistic teaching methods were used, outdated teaching practices were utilised, and the authority of the teacher was maintained through corporal punishment. The author goes on to state that these ideas were so impactful that they resulted in the establishment of compulsory education in Germany in 1871 (ibid.).

Although a lack of consensus in identifying the origin of reform ideas persists, all advocates of the so-called "alternative" or reform ideas in education opposed the prevailing system of education, which can be best characterized as the Herbartian Pedagogy.

CONCEPTUALIZATION OF SCHOOL LEARNING SPACE AND EDUCATION IN HERBARTIAN PEDAGOGY

Herbartian Pedagogy, which was prevalent from the 19th century until the end of World War I, defined the values of duty ethics as relevant for education in schools, as well as provided four formal stages of teaching, the purpose of which was twofold (Herbart, 1835, 1874). On the one hand, the stages made the teaching process more organized (step-by-step work), by gradually guiding students through the topic of each lesson. On the other hand, the stages allowed the possibility of identification with the teacher. According to the established associative psychology of that time, it was believed that the ongoing mental processes in the teacher (e.g., analysis, synthesis) evoked the same processes in students. Through these processes, through presenting the subject matter, students' trust in the teacher was to be established as they followed the teacher's presentation of the lesson. Moreover, it was assumed that in this process, students emulated the teacher's personality and, in this way acquired knowledge (Medveš, 1989: 240-241; Medveš, 2000: 91-92).

Fig. 2 Physics lesson in an Austro-Hungarian secondary (Realschule) school in 1900. The picture presents a simulation of a lesson in a secondary school in Austro-Hungary, as presented at the Slovenian School Museum.

Fig. 3 Fourth grade of Globoko Primary School, 1914

By analysing classroom images of that time (Fig. 2), two separate areas can be observed in the classroom: teacher's area and, opposite it, an area for students. The gazes of the teacher and students met at an imaginary boundary, visually establishing an "axis" for the projection of thinking, emotions, and feelings from the teacher to the students. Another type of "boundary" between the teacher's space and the students' space was created by the difference in height – the teacher, typically standing, occupied a space on a pedestal, while the students sat at fixed desks (Fig. 2). The teacher's elevated position itself served to firmly establish their position of authority in the classroom.

From a knowledge perspective, school learning space was adapted to the prevailing epistemological paradigm of the time, which perceived reality as cognizable through the senses or facts; it stipulated that facts, transmitted through words, provided accurate descriptions of reality (David, 2018; Ule, 2004: 43-128). Based on this, the teacher was believed to "project" facts onto students through verbal, one-way communication. In a society grounded in values and logic of the so-called common, the teacher represented a fundamental source of knowledge and was regarded as a representative of truth. Through this principle, the ideal of universality was pursued, and standards of the so-called normality were established (Reckwitz, 2023). It was through standardisation and formalism that order, stability and efficiency of social practices were established in society (ibid.: 97)

Owing to this value and epistemological basis, communication in school during lessons was uniform for everyone. Consequently, the educational effect was understood to be stronger the more uniform, consistent, and identical it was (Medveš, 2018: 8). Physical space of a classroom, lacking partitions, curtains, spaces for withdrawal, or a possibility of parallel execution of at least brief other educational activities, such as relaxation, contributed to this. However, the arrangement of physical space allowed for constant supervision and immediate possibility of detecting and sanctioning mistakes.

It can be assumed that the way classrooms were furnished was linked to the above principles. Given that words were understood as the only means of transmitting knowledge and "teaching communicated only with words," which were essentially "representations" or "images" (Herbart, 1903: 148), teaching aids primarily consisted of visual materials, which were identical for all students and intended equally for all of them (Figs. 2 and 3).

After the adoption of the third state elementary school law in Austro-Hungary in 1869, schools were required to obtain prescribed teaching aids for each subject. For instance, maps of Austro-Hungary for History and Geography lessons (Fig. 2), hundred-square for Mathematics, and anatomical representations of the human body for Natural History (Fig. 3; Pavlič, 1978: 61-75). The law prescribed teaching aids for each subject, however, the results of a review show that most of the tools used were visual (posters, wall pictures), and no materials which students could hold in their hands were used. Since certain standards of "normality" in the development of learners were established based on age group, the tools utilised were identical for everyone in the class, without any adaptation.

Reckwitz (2023: 377) states that "standardised education" in a company of "equals" "coincided with the ideals of general education", and is critical of the current phenomenon in education, where universality, standards and norms have been "lost". He points

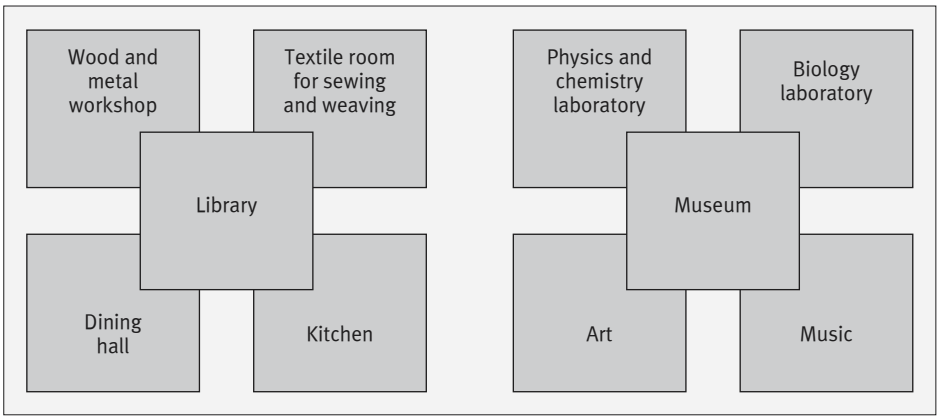


FIG. 4 LAYOUT OF DEWEY'S SCHOOL BY FLOOR AND ROOM: DIAGRAM OF THE GROUND FLOOR ROOMS (LEFT), UPPER FLOOR (RIGHT)

out that schools compete not only in the uniqueness of the school culture and the specificity of the educational programme offered, but also in offering unique programmes tailored to each individual student (ibid.: 382).

The end of World War I saw the decline of Herbartianism. Direct authority was not approved of in society anymore. There was a shift from the teacher as the key factor of education to the students and their needs regarding education and school learning space.

TRANSFORMATION OF SCHOOL LEARNING SPACE AND THE SHIFT IN THE UNDERSTANDING OF THE LEARNING PROCESS

The initially posed question where the first architectural designs of schools and classrooms, which were more child or student-friendly and at the same time more "open" in their design, originated remains unanswered.[6] Even though the issue remains unresolved, two crucial developments can be singled out as having played a significant role in the development of school learning space interior in the period at the turn of the 19th century to the 20th and after the decline of Herbartian Pedagogy.

Firstly, school learning space, previously a fundamentally unifunctional space dedicated to teaching or cultivating the young, began to be replaced by a multifunctional and hence more complex school learning space or multiple spaces (Kricke, 2020). Secondly, differently designed or conceptualised school learning space with multiple functionalities resulted in different furnishings. This in turn was a consequence of a new understanding of learning and teaching in line with the principles of Reform Pedagogy.

Regarding the first point, the shift from a fundamentally unifunctional school learning space to a space with multiple functions implies a reversal in understanding the complexity of the significance of school learning space, whose role became considerably broader at the time. This can be observed through Montessori's (1914) definition of school as a child's "second home".[7] It had various sub-spaces assumed to be "more child-friendly," such as day room, club room, and workshop[8] (Montessori, 1914: 9-10). Similarly, in Petersen's (1927) definition, the school was intended to be a friendly home for students. For this reason, it should have, besides the workshop, also appropriately designed multiple spaces, including a multifunctional classroom for various learning needs or situations, such as group work, circles, courses, and breaks (Petersen, 1927: 18-19). All this demanded not only a larger school learning space but also a more open understanding of school as such, where the emphasis is not on sitting and learning anymore.

The complexity of school learning space is evident from Dewey's concept of ideal school (Fig. 4), as described in his work *School and Society* (1932). The author placed workshops[9] for practical learning in two "corners" of the lower floor of the school building, whereas in the centre of the floor he positioned a library as a "collection of intellectual resources" (Fig. 4). Dewey claimed that resources offered a basis for practical work of the youth, giving their work broader meaning and value (ibid., 72-76). In a similar way, he defined the learning spaces of the upper school floor (Fig. 4): he placed laboratories for special subjects and rooms for various arts in individual "corners" of the building, connecting them in the centre with a museum as a collection of materials. He explained the role and the arrangement of space by saying that the collected materials at a concrete level conceptualised and gave meaning to the entire learning process: from idea to product. They should be exchanged continuously based on subjects and topics (ibid., 76-80).

As recognized, the boundaries of the internal school learning space or classroom have expanded beyond just the architectural dimen-

6 It is quite challenging to identify common or general characteristics of school learning spaces and classrooms from the end of the 19th century, no matter whether they originate from the principles of the Reform Pedagogy or advanced ideas of the 19th century Prusia.

7 Montessori calls school the "house of children" (for instance Montessori, 1914: 9-10).

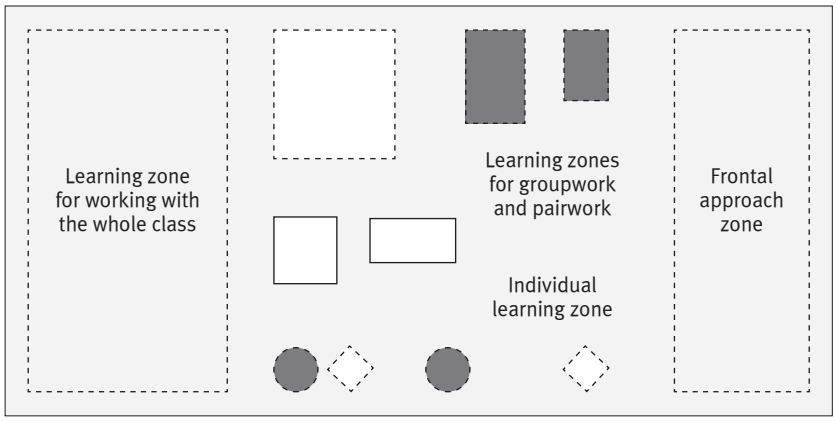
8 In addition to these rooms, Montessori proposed the following rooms: gym, bathroom, kitchen and dining room (Montessori, 1914: 9-10).

9 Dewey emphasised the importance of wood and metal workshop and sewing and weaving workshop (Dewey, 1932: 72).

sions, but also conceptually. The school should not only be the "second home" for students, but also, their first, according to Dewey's ideal school "cultural sanctuary" and "scientific preparatory ground".

Secondly, concerning the development of the interior of school learning spaces, with the decline of Herbartian Pedagogy and the transition from the 19th to the 20th century, it became apparent that a changed, more complex understanding of the school learning space also presupposed a changed understanding of how school spaces should be furnished. This coincided with the tendencies towards an altered perception of the educational process.

Whereas in the Pedagogy of Herbartianism, teachers were mainly committed to verbal transmission of knowledge to students, and their words were considered to be the main means of teaching, their role, at the turn of the 19th to the 20th century became at least partially 'superseded' by other, so-called external sources. Students were now supposed to access knowledge as independently as possible using those external sources. This process would be facilitated by learning materials available in the learning space, for instance books in the library, as seen in the concept of Dewey's ideal school. According to Montessori's theory (Montessori, 1914, 2008: 11), it was the didactic material that was supposed to replace the direct mediating role of the teacher[10], while students, were supposed to choose materials according to their own discretion, desire and need, and learn at their own pace and in their own way. According to Dewey's and Peterson's theory, peers too represented external sources of knowledge. Both authors claim that students should be able to learn with others, in different ways, for instance through group work or in a circle where students and a teacher conduct the so-called topic discussions. It should be mentioned that neither of the last two approaches, contrary to Montessori's theory, excludes the frontal approach which is directly led by the teacher (Dewey, 1997: 139-163; Montessori, 1914, 2008; Peterson, 127: 17-41)



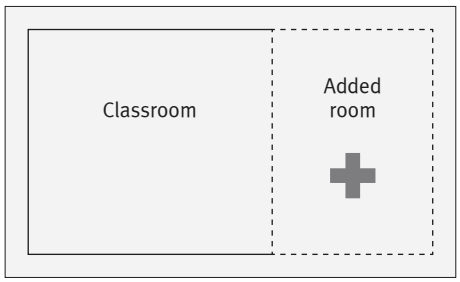


Fig. 5 (left) Classroom plus layout

Fig. 6 (up) Layout of open learning landscape

In contrast to the Pedagogy of Herbartianism, the authors of all three discussed theories emphasised that internal sources of learning should be considered to foster an effective learning process, such as the students' desires, interests, as well as the right to make choices and decisions in the learning process (Dewey, 1997: 152-163; Montessori, 2008: 11, 20; Petersen, 1927: 17-41). This is one of the main focal points of Reform Pedagogy.

To conclude, the turn of the 19th to the 20th century saw a shift from the unifunctional and relatively simple school learning space towards a more complex learning space with different functionalities, based on the aspirations of reformist educators.

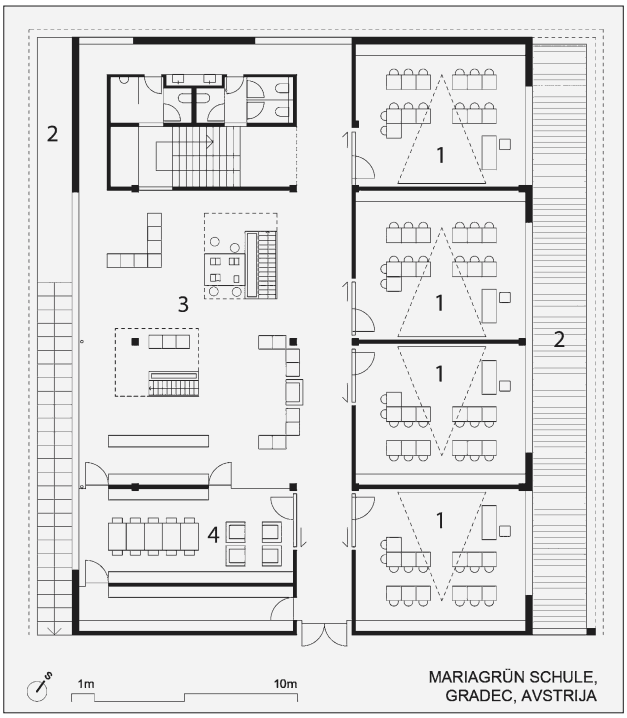
Contemporary Architectural Concepts of Student-friendly Learning Space

After World War II, reformist pedagogical movements failed to penetrate most state school systems in Central Europe. However, certain principles, including architectural ones, had a relatively strong impact on official Pedagogy (Medveš, 1989) and contemporary school architecture. It is challenging to specify which reformist direction developed each solution.

According to one of the basic classifications of school learning space models[11], the so-called classroom plus (Fig. 5), represents an

10 The didactic material included a key to provide feedback on students' work (Medveš, 1992: 9).

11 This article uses classification that is well-established and most frequently used in the German-speaking environment. It was chosen because architectural concepts of schools in Austria and Germany were studied within the Target Research Program "CRP 2021". Contrary to the classification used, authors like Bobovec, Matekovic and Rako (2020) base their work on a different typology of spaces. These authors distinguish, for example, between single-track and double-track designs, molecule, pavilion, container, central design, village or city, fortress, etc (ibid., 34-35).



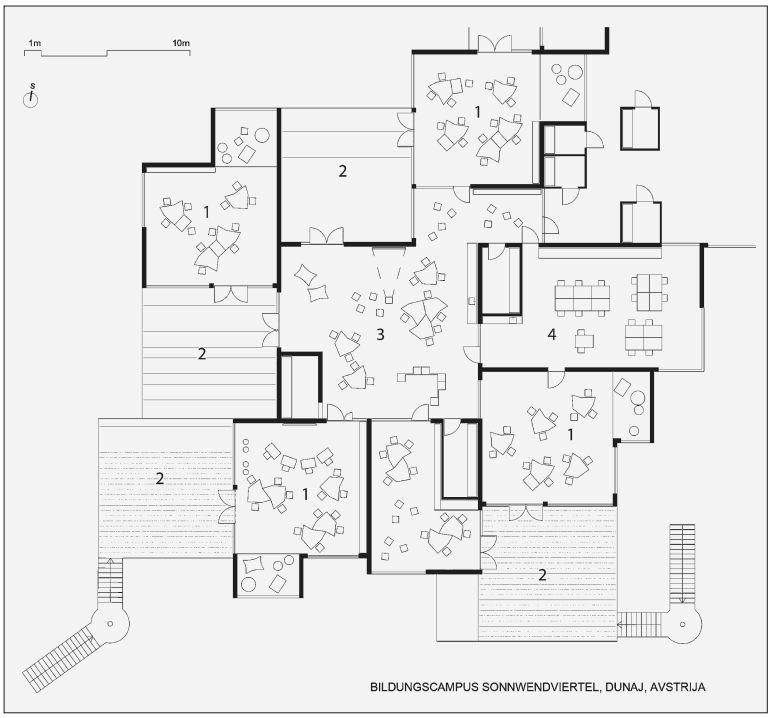


FIG. 7 CLUSTER SCHOOL DESIGN IN VOLKSSCHULE MARIAGRÜN, GRAZ. DESIGN: CHRISTOPH KALB AND PHILIPP BERKTOLD. ONE OF THE FLOORS: 1 – CLASSROOM, 2 – TERRACE/BALCONY AS OUTDOOR CLASSROOM, 3 – OPEN LEARNING SPACE OR CENTRE, 4 – STAFF ROOM. FOR MORE INFO: HORVAT, 2022.

FIG. 8 CLUSTER SCHOOL DESIGN IN BILDUNGSCAMPUS SONNWENDVIERTEL, VIENNA. DESIGN: Š PPAG ARCHITECTS. A PART OF PRIMARY LEVEL FLOOR: 1 – CLASSROOM, 2 – TERRACE/ BALCONY AS OUTDOOR CLASSROOM, 3 – OPEN LEARNING SPACE OR CENTRE, 4 – STAFF ROOM.

elementary contemporary architectural concept, where an extra multifunctional space is added to the classroom to be used for the purpose of carrying out parallel learning activities without losing visual contact (Fig. 5) (Hubeli et al., 2019: 100-101).

Although the development of conceptual architectural designs of interior school learning space moved towards multifunctionality, it is interesting that the fundamentals of classroom plus can be found in the 1903 bulletin 'The New Building for Education and the Laboratory Schools at the University of Chicago', in which Dewey envisioned ideal school classrooms with a separate learning space for conducting group work. As he wrote: "Connecting with each grade-room, there is a smaller room, half the size of the grade-room, to be used for purposes of group-work." (Bulletin of Information of the School of Education of the University of Chicago, 1903, cited in Wirth and Bewig, 1968: 85).

The question how this architectural concept has evolved into more complex ones, i.e., the cluster and the open learning landscape (Fig. 6), remains open from an architectural point of view. However, it should be noted that the cluster concept represents "a group of spaces in which several learning spaces and classrooms, together with associated areas of differentiation, recreation and regeneration, are grouped together in a clearly identifiable unit" of a classroom, linked by a kind of group centre (Hubeli et al., 2019: 102-103). Given that Dewey's concept of the ideal school building is also defined by multiple spaces with different functions, it can be assumed that the beginnings of the contemporary architectural concept of cluster were already implied in Dewey's ideal school building concept (Fig. 4).

Comparing Dewey's ideal school design with some contemporary architectural cluster concepts such as the Volksschule Mariagrün in Graz (Figs. 7 and 9), and the Bildungscampus Sonnwendviertel in Vienna (Figs. 8 and 10)[12], similarities can be found between them in terms of clearly defined classrooms. In the designs, individual classrooms are intended for the teaching of individual classes. However, if we compare the design of one of the floors of the school building of Volksschule Mariagrün (Fig. 7) with the design of a part of a floor on the primary level of Bildungscampus Sonnwendviertel (Fig. 8), it seems that based on the type of school learning spaces, the Graz school is more similar to Dewey's concept of the ideal school than the Vienna school. It can be understood that at Volksschule Mariagrün (Figs. 7 and 9)[13], the library tower and computer tower try to replace Dewey's library, while the science station is

12 These schools are presented because they were selected for a more detailed study in the previously mentioned Target Research Program "CRP 2021".

13 Inside the so-called learning island as open learning space.

Fig. 9 A view of open learning space with a reading tower at the front, which is accessed by a staircase, with a computer tower, covered with netting on the top, on the right and other temporary niches in Volksschule Mariagrün school in Graz

Fig. 10 A view of open learning space or centre of a part of floor at primary level in Bildungscampus Sonnwendviertel school in Vienna

used instead of the workshop and the specialised classrooms of the ideal school concept. However, judging from the available photographs and the layout (Figs. 8 and 10) learning spaces with specific roles are not apparent in the architectural concept of Bildungscampus Sonnwendviertel. At the first glance, the design of Bildungscampus Sonnwendviertel seems to be even more similar to Dewey's ideal school than the design of Volksschule Mariagrün. However, regarding the identification of roles of learning spaces, the Vienna school is not so similar to Dewey's ideal school design. From a structural point of view, the cluster design, as seen in Bildungscampus Sonnwendviertel, seems functionally undefined or 'open'. Unlike Volksschule Mariagrün, however, each of Bildungscampus Sonnwendviertel (Fig. 8) classrooms is fitted with an additional smaller room and therefore such a classroom functions as a classroom plus. However (judging by the plan and the pictures), it is not intended for group work, but for rest, relaxation, socialising or other activities.

This raises the question whether the main intention of the authors of an architectural design such as the Bildungscampus Sonnwendviertel was to create a cluster structure or a state-of-the-art design, the so-called open learning landscape as the "interior" learning spaces are functionally relatively less defined. As stated by Hubeli et al. (2019), the open learning space design assumes the creation of "multi-purpose open learning areas, enabling individualized learning and learning in small groups", with the understanding that the number of enclosed functional spaces is kept to a minimum, and various access areas and common spaces are directly integrated into it as so-called communication zones (Hubeli et al., 2019: 102-103; Fig. 6). The Bielefeld Laboratory School in Germany, built in the 1970s (Fig. 1) serves as an example of open learning landscape design. Interestingly, unlike schools in Germany and especially Denmark, which are also built according to the architectural concept of open learning landscapes, no schools built according to the latter concept were found in Austria.

In the second half of the 20th century the development of school learning spaces took place through various architectural concepts, such as classroom plus, cluster and open learning landscape design, depending on the educational system of each country. It is assumed that Dewey's concept of ideal school served as the basic conceptual framework.

Contemporary architectural concepts of the school learning space discussed here clearly show that the focus on the student seems to have become even more important in the 21st century, which is further confirmed by The Salamanca Statement (1994) that introduced the principle of inclusion as a new social norm in schools. The principle of inclusion dictates that school systems and programmes are formed in the way that considers the diversity of students and each individual's needs, which should also be reflected in the school learning space.

The Specifics of Contemporary Time and Space and Communication Pedagogy

Although this chapter remains within the framework of the Reform Pedagogy, we touch upon the analysis of the comparison of the presented contemporary architectural concepts of schools (classroom plus, cluster, and open learning landscape) from the perspec-

tive of the so-called Communication Pedagogy, according to which the student remains the central focus of education. This is one of the most current pedagogical theories or paradigms, which is currently not consistently implemented even in the German-speaking areas since it is still gaining recognition. Therefore, the purpose of this chapter is to outline possible directions of thought that Communication Pedagogy opens up for the field of architecture.

According to Communication Pedagogy, communication is understood as the fundamental means of teaching, through which goals can be pursued, with one of these being communication itself, within the classroom. We do not understand it if we define communication merely as the conversational method of teaching or dialogue as part of the teaching practice. It can be defined as an interactive, open interpersonal relationship between the teacher and students and among the students themselves, characterized by the recognition of the equality of all subjects involved in the teaching process (Medveš, 2018: 7-15). In educational practice, this is not self-evident, as teaching is permeated with the so-called guided schoolwork methods – explaining, storytelling, describing, addressing, reminding, warning, preventing, rewarding, and punishing – which do not correspond to the definition of communication we rely on here, based on Habermas (1995) and Luhmann (1991). According to the former author, communication is defined as a form of listening to the interlocutor's ideas and viewpoints, expressing arguments, contesting them, accepting or critically defining them, and seeking consensus, but without any authority's dominance. This means, for instance, the teacher is not supposed to impose their views or arguments on students'. The only rule that applies is the assertion or dominance of the better argument (Medveš, 2018).

A different version of communication, based on neuroscience, is represented by Luhmann's (1991) definition, which has been applied to Pedagogy through the author's so-called Systemic Theory. According to this view, there are two "closed", independent systems present in educational process. One is communication, represented by the learning process, which, in the pedagogical context, means a mutually evolving activity established on the responses of the student and the stimuli of the teaching content. The other independent system represents the student's consciousness, which acts as a "black box". Importantly, neither the communication of teaching nor the consciousness of the student (or teacher) can mechanically influence each other. Each individual's consciousness can only make sense of and structure external influences, such as specific teaching content, through its own ("cognitive") filters. Changes in the student's consciousness towards the set learning goal are expected to occur during educational process; it is assumed that this change in consciousness can only be achieved through communication (Medveš, 2020).

Since teachers lack a tool through which they could reliably and directly influence the change in the student's consciousness towards the learning goal, it is crucial that they plan the teaching or communication as carefully as possible. Therefore, they build it gradually through stimuli directed at the students, their responses received in real-time, and move towards the purpose of teaching or the set objectives (Medveš, 2020).

The significance of the highlighted architectural concepts of the school learning space, classrooms plus, cluster, and open learning landscape, can be better understood through the conceptualizations of communication in the context of Communication Pedagogy. Indeed, if teachers are to monitor students' responses to a given stimulus or prompt, and if they are to contemplate how students make sense of and structure the information provided, if they are to seek reasons for given responses, it can be inferred that a relatively more organized school learning space is necessary for learning and communication. If a lesson is to be organised in the way that it builds on the responses or views and arguments of students, a transparent school space is required, since a closed classroom with rows of desks would make it more difficult to achieve the goals. Considering that each student's argument and response is supposed to be a stimulus to their peers, it seems that desks organised in rows would hinder communication or cause unequal position of students. Whether this may also cause unequal status of their views, responses, and arguments, will be left aside for now.

However, a question arises how to understand the architectural concept of an additional, i.e., "plus" room, in the context of a classroom plus. How is communication created when an individual or a group of students are occasionally moved into a separate room? With what responses, arguments, perspectives, and stimuli is communication in the plus room fostered (or limited), and with what responses, arguments, perspectives, and stimuli in a room separate from it? How is communication fostered (or limited) when the teacher removes the boundaries of the plus room? Similar questions apply regarding the associated areas of differentiation, recre-

ation, and regeneration in the architectural concept of a cluster.

From the perspective of Communication Pedagogy, spatial exclusion is non-inclusive, so the question remains open as to what is to be understood as constructive in the school learning space or classroom from the perspective of Communication Pedagogy.

Conclusion

This paper defines school learning space through pedagogical paradigms. Drawing on the Herbartian and Reform Paradigms, the analytical-descriptive and analytical-interpretive methods have been used to study the school learning space in the period from the 19th century to the present day, in the German-speaking and partly southern part of the Nordic area. The conception of the school learning space was examined based on how teaching or the learning process is perceived in each paradigm.

In the 19th century, when the Herbartian Paradigm was established, it was understood that learning was the result of the teacher's personality in the process of conducting lessons, which the teacher carried out for all students simultaneously, in the same way, using the same means. The school learning space or classroom was essentially intended for learning and was relatively simply arranged and transparent, with a structure of order created by desks arranged in rows.

At the turn of the 19th to the 20th century, the perspective on education changed. The focus shifted to students, who became the focal point of instruction, with an emphasis on considering their desires and needs and enabling choice in implementation. The school learning space gained multiple roles, aiming to become ostensibly "friendlier" to students ("second home"). In the presented conceptualization of the school learning space, a conceptual basis that is also implemented in contemporary school architecture can be recognised. Some of the architectural concepts that are prevalent today – such as classroom plus, cluster, and open learning landscape – supposedly draw on Dewey's concept of an ideal school.

This article only touches upon contemporary Communication Pedagogy. Communication is defined as a fundamental tool of instruction, aimed at achieving the goals and purposes of teaching, one of which is communication itself. According to Communication Pedagogy, the teacher should constantly reflect on and observe how students make sense of and structure their knowledge and, based on this, respond as constructively as possible in real-time. Through the analysis of the contemporary architectural concepts of the school learning space highlighted here, the open learning space of the school has been defined as more constructive, as it does not isolate students.

Despite all spatial solutions intended to make teachers' work more constructive, at least two issues remain unresolved. Firstly, whether communication, which is not spatially limited in the classroom, for instance by barriers or boundaries, poses a problem at all. According to Communication Pedagogy, any communication limited in space restricts responsiveness. However, it is assumed that the challenges teachers face in the classroom concern their reactions to the students' responses. Secondly, and related to this, can it be a spatial problem (related to the arrangement and design of the classroom) if communication cannot develop beyond the boundaries of the "home" classroom? From the perspective of Communication Pedagogy, communication limited to the "home" classroom is seen as "confined". However, teachers' problems usually do not stem from communication that opens up thinking beyond the intended topics, rather the opposite. Therefore, it may be more sensible to focus less on the perfection of highly specialised school learning space but rather seek solutions that do not limit (potential) thinking due to overly specific content.

It has become apparent that there is no escaping the questioning of what to pursue and what to move towards in the future. It is school that defines the culture of all of us. But the questions outlined here, and especially the final ones, can help us think more clearly about how to define school in the future.

[Translated by: Mojca Lorber, MA]

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Illustration sources

Fig. 1	Photo: Dirk Damm
Figs. 2, 3	Slovenian School Museum, photo library
Fig. 4	Dewey, 1932: 72, 76
Fig. 5	Hubeli et al., 2019: 100
Fig. 6	Adapted from Hubeli et al., 2019: 102
Fig. 7	Cluster school drawing by Mojca Gregorski, Eva Hočevar, Tjaša Tahirović, Hana Videmšek and Mitja Zorc based on the cluster school design in Volksschule Mariagrün, Graz
Fig. 8	Cluster school drawing by Mojca Gregorski, Eva Hočevar, Tjaša Tahirović, Hana Videmšek and Mitja Zorc based on the cluster school design in Bildungscampus Sonnwendviertel, Vienna
Fig. 9	Photo: Mitja Zorc
Fig. 10	Photo: © Hertha Hurnaus; PPAG Architects, 2022 (For more info: PPAG Architects, 2022)

Author's biography

Barbara Horvat holds a Doctoral Degree in the field of Pedagogy. She pursued her under and postgraduate studies at the University of Ljubljana, where she has received the Prešeren Award. She is employed at the Faculty of Education of the University of Primorska as Associate Professor in Didactics. She furthered her studies primarily in Trieste. Her research is focused on examining didactic content, currently with a focus on the learning space.

Book reviews

Summaries of doctoral dissertations

Robert Plejić

Architect Jerko Marasović – Renaissance Man of the Twentieth Century

Arhitekt Jerko Marasović – renesansni čovjek dvadesetog stoljeća

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The book Architect Jerko Marasović – Renaissance Man of the Twentieth Century by Katja Marasović and Snježana Perojević and by Zlatko Karač and Branislav Trifunović was published in cooperation with the Split Architects Society and the Faculty of Architecture of the University of Zagreb on the occasion of the hundredth anniversary of the birth of Jerko Marasović (1923-2009), a prominent Croatian architect whose work was particularly significant in the field of research, scientific processing and restoration of Dioclетian's Palace and the historical core of Split.

He devised, and applied in practice, his own methodology for processing architectural heritage, and as head of the Department for Architectural Heritage of the Urban Institute of Dalmatia (since 1954), with great support from the city's management structures, he led the systematic revitalization of the historic core of Split in the 1960s. Organizing the work of the respective department, on the basis of innovative methods and approaches to research, was founded on his *par excellence* architectural knowledge, stemming from meticulous urban planning studies, creative spatial solutions and superior structural analysis. By intensively publishing the results (to a good extent thanks to his brother Tomislav) and educating students at the postgraduate level "Building Heritage" study at the Faculty of Architecture in Zagreb, the architectural profession in the sphere of research, restoration and protection of architectural heritage in Croatian areas was promoted from a traditionally collaborative one to a completely equal status one. It was not always easy, but Jerko Marasović's results confirmed that in particularly complex procedures of urban reconstructions or more significant structural analysis, the role of architects within expert teams of conservators, art historians, archaeologists, sociologists and constructors can be a leading one.

In the **Biography** of Jerko Marasović, a broad overview of this successful family from Split, their social and business contacts and their role in the period between the world wars, when Split became the administrative center and the largest port of the new state, was opened. Jerko's father was a prominent builder and construction entrepreneur from Split, Marin Marasović, and Jerko's uncle was architect Fabijan Kaliterna, the author of visionary spatial and development studies of Split and a key figure in the architectural scene of this period.

In the stimulating atmosphere of international functionalist models promoted in Split in the twenties by architects and Prague students, among whom Josip Kodl stood out with his realizations of clean cubes and flat roofs, the generation of Jerko's second cousins grew up, including Milorad Druzeic (1911), Rikard Marasović (1913) and Miro Marasović (1914), as well as Jerko's first cousin Neven Šegvić (1917). All of them went to Zagreb to study architecture, and with their professional activities as successful architects, designers, planners and university professors, they left significant traces in Croatia in the period after the Second World War.

In the second chapter, **"Graditeljstvo"** (a Croatian term advocated by Jerko Marasović as a common name for urbanism, architecture and civil engineering) the initial unit is *The Methodology of processing architectural heritage* with an introductory text by Ivo Petricioli. Katja Marasović systematically explains the importance of architectural survey and the study of historical constructions in Jerko Marasović's work, and along with descriptions and explanations, she presents numerous studies of the spatial development of the city of Split, individual city spaces and individual architectural complexes.

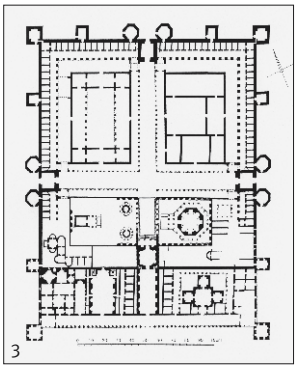
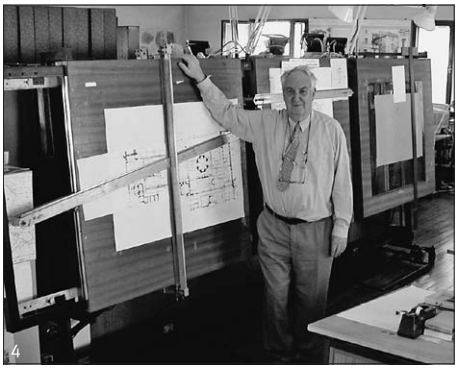
In the extensive and very personal text *Motive and method of Jerko Marasović,* Branislav Trifunović recalled joint cooperation and stimulating discussions, highlighting Jerko's reconstruction of the Church in Gradina in Solin.

In the section **Studies, projects and realizations,** Katja Marasović analyzed the circumstances and peculiarities of the works in Diocletian's Palace, the Amphitheater in Pula, as well as the renovation projects of historical buildings and complexes, churches and monasteries and urban projects, accompanied by numerous drawings and photographs. In this part, one can also read about *The projects of contemporary architecture and marinas* by Snježana Perojević. Marasović's original architectural projects and realizations were analyzed and valuated for the use of elements of a purer modernist expression or elements of a kind of critical regionalism.

The part **Pedagogical work** is a very exhaustive and multi-layered contribution by Zlatko Karač, which contains facts about the history of the study as well as witty comments about his own student experiences. It focused on Marasović's work at the post-graduate study "Architectural Heritage" of the Faculty of Architecture University of Zagreb. The study took place in Split, in the northwest tower of the Palace, which Jerko arranged as a study center of international recognition for various forms of education and training in the domain of heritage protection. These spaces have grown into a sort of Split *acupuncture point* of architectural events, and since 2003, has enabled the continuity of education in the courses of research and protection of the architectural heritage of the Study of Architecture University of Split. According to Karač, he was a charismatic professor of key architectural courses who continuously educated eight post-graduate generations (1975-1991) and two more after the post-war reconstruction of the Study (since 1997), a total of about 250 students. Former students who are still active are irreplaceable experts, on whose education, scientific research and professional management of the most complex monument restorations rest today.

In the part **Cooperation with distinguished experts,** Katja Marasović wrote about cooperation and friendly relations with Cvito Fisković, Ejnar Dyggve, Branimir Gabričević and Ivo Petricioli. Einar Dyggve, a world-renowned Danish architect and archaeologist, was a great role model for Jerko Marasović, because both architects acted as leading researchers in archaeological endeavors. They maintained their sincere friendship and mutual respect through constant correspondence and occasional meetings.



Sheila McNally, American archaeologist and art historian was responsible for starting the project "Diocletian's palace joint excavation project" of the Urban Institute of Dalmatia and the University of Minnesota. Tomislav Marasović recalled the project launched in 1968 with the support of the prestigious Smithsonian Institute from Washington. The research lasted ten years, led by Jerko Marasović from the Urban Institute and Sheila McNally as the main American researcher, and the results were published in Croatian and English.

In the chapter **Other areas of activity**, Katja Marasovic detailed and documented numerous lesser-known details about architect Marasović's systematic pursuit of photography, meteorology, design and invention. A particularly demanding task, which he set himself, was the design and production on his own of a mechanical device for creating a constructed perspective in 1984. Jerko, not wanting to wait for the computers to become sufficiently capacitated, started using this device to create spatial representations of the historical stages of the development of Split. The bulky system of levers, weights and steel cables with three drawing boards placed vertically in front still works perfectly today. For new generations of students, facing with Jerko's device is often associated with Vrančić, *Machinae novae* and *Cinquecento*, and as a monument to the vision of a genius engineer, it leaves no one indifferent.

Shipbuilding is a separate whole, in which we follow in detail Jerko's dedicated work on designing and building ships. With the ship *Maistral,* which he built according to his own design, at the age of 44, he began his regular, persistent, almost ritualistic sailings along the Adriatic.

Due to the breadth of his interests and successful activities in various areas, many recognized in him the qualities of a true Renaissance man.

The memories of contemporaries contain the texts of the final chapter of the book. David Grove, English urban planner, Jukka Jokhilekto, a Finnish architect and urban planner, and Jean-Louis Paillet, a French architect and historian, were Marasović's collaborators and friends, and with great respect they point out his working energy and firm belief that with thoughtful design, large parts of Split's historic core and Diocletian's Palace can be arranged and equipped for contemporary use. Academician and archaeologist Nenad Cambi placed Jerko's work together with that of Robert Adam, Vicko Andrić, Georg Niemann and Ernest Hebrard, emphasizing the invaluable wealth of documentary material that Jerko left to the city and science. Miljenko Domijan, art historian and conservator in his own special, direct way recorded frequent contacts and cooperation with "šjor Jerko".

Architects, students of Jerko Marasović – Lemja Chabouh Akšamija, Zlatko Jurić, Vedran Mimica, Željko Peković, Snježana Perojević, Robert Plejić, Ivo Šprljan and Ivo Vojnović, today's Doctors of Science and professors, in their memories of their post-graduate studies, bring warm, somewhat nostalgic notes and highlight Marasović's uncompromising scientific approach and a unique breadth of knowledge, experiences and skills.

The appendix to the book contains list of professional and scientific activities of Jerko Marasović, as well as published works and awards, prepared by Katja Marasović and Emanuela Tomelić, Ivan and Josip Bošković and Dražica Kekez. Attached is **The content and processing of architectural survey of the existing state** made in 1983 by Jerko and Duško Marasović, which, as a methodological manual, was accepted and used in the work by numerous institutions and experts in our country and beyond.

The book with 418 large format pages and more than 600 illustrations was carefully and precisely designed by Professor Viktor Popović. It will be especially useful to all those who study the architectural heritage of Split and Dalmatia as a valuable source of information and a reviewed guide through the rich archive that Jerko Marasović created during almost 60 years of intensive activity. Katja Marasović did a very demanding editorial job excellently, and the members of the editorial board included, among others, Ivan and Marija Bošković, and Kate Bošković as proofreader, members of Jerko Marasović's immediate family, so the book was also a complex family undertaking.

Caricature on the cover:
Un vision "léonardesque" de mon ami Jerko. Split 19 April 1986 by architect Salvador Moreno de Alborán Peralta
Fig. 1 Ejnar Dyggve and Jerko Marasović on the Split waterfront in 1958 (URBS Archive)
Fig. 2 The ten-meter sailboat Maistral designed and built by Jerko Marasović in 1963-1970 (Marasović family archive)
Fig. 3 Reconstruction of the original appearance of Diocletian's palace, Jerko Marasović 1989 (Mediterranean Center Archive)
Fig. 4 Jerko Marasović and his device for creating a constructed perspective (Mediterranean Center Archive)
Fig. 5 Jerko, Tomislav, Mirjana Marasović and Ivo Petricioli in Ravenna in 1957 (Archive of the Petricioli family)

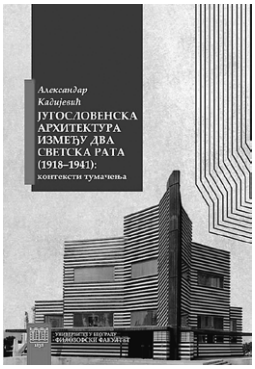
The impressive life energy of Jerko Marasović, his commitment to work and research, always with the support of his family, left deep traces in many areas of his activity, indebted to this community and the architectural profession in general. As the initiator and manager of grandiose undertakings, no longer possible today, which lasted for decades, he contributed to the city of Split, with its historical transformations and successful processes of research, protection and restoration of architectural heritage during the twentieth century, taking a prominent place on European architectural maps.

Jelena Gačić Ivanov

Yugoslav Architecture between the Two World Wars (1918-1941): Contexts of Interpretations

Jugoslavenska arhitektura između dva svjetska rata (1918.-1941.): konteksti tumačenja

Aleksandar Kadijević



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238 pages: narrative, list of literature, abbreviations, 37 illustr., summary in English, index, and biography of the author

ISBN 978-86-6427-271-1

Many years of productive research by Prof. Dr. Aleksandar Kadijević on the phenomenological aspects of the interwar architecture of the Kingdom of SHS / Yugoslavia as a state unit have been layered and systematized in the monograph "Yugoslav Architecture between the Two World Wars (1918-1941): Contexts of Interpretation".

The content consists of ten chapters, or essays, with a conclusion or an epilogue, aimed at deepening the discussion and research perspectives of the period in question. In the first chapter, *Architecture in the Epoch of Extremes – A Chronology of Research*, the author provides a chronological overview of previous interpretations and explains in detail the characterization of the term "Yugoslav architecture", emphasizing that it encompasses the achievements of regional schools and architectural Yugoslavianism. In the second chapter, *Yugoslavianism in Architecture (1918-1941) as a Phenomenon and a Historiographical Problem,* the importance of King Aleksandar I Karađorđević in the unification of architectural creativity is highlighted, along with the openness of the Zagreb school to contemporary architectural ideas, thanks to its charismatic leaders (Viktor Kovačić, Hugo Ehrlich, Zlatko Neumann, Drago Ibler, Lavoslav Horvat, Zdenko Strižić, and others) who were educated in Central European centers and extended their training to France. The third chapter, *The Social Role of Visual Culture in the Kingdom of SHS /Yugoslavia (1918-1941),* provides an overview of the emancipatory role of artists, designers, art groups, professional associations, exhibition activities, and institutions in the international affirmation of the then-Yugoslav art scene. Notable figures include Ivan Meštrović, Anton Augustinčić, Kazimir Ostrogović, Krsto Hegedušić, the art group Zemlja, the exhibition Half a Century of Croatian Art (1938), the House of Fine Arts in Zagreb, and many others. The complex issues surrounding the announcement, maintenance, and awarding criteria for Yugoslav competitions for important public buildings are explained in the fourth chapter, *Interwar Competitions: Points of Convergence and Separation of Yugoslav Architects*. Due to the extensive enrichment of existing knowledge about the Zagreb competitions of this period, the author positively discusses the monograph „For a New, More Beautiful Zagreb! Architectural and Urban Planning Competitions of Interwar Zagreb 1918-1941" („Za novi, ljepši Zagreb! Arhitektonski i urbanistički natječaji međuratnog Zagreba, 1918.-1941.") by Dr. Tamara Bjažić Klarin.

In the fifth chapter, *Architecture of Emigrants from Russia – between national trauma and the construction of Yugoslav Identity*, their authorial contribution, which was studied in Croatia by Darko Kahle, Aleksandar Kadijević, Natalija Marčelja, Neda Mucafir, Tatjana Puškadija Ribkin, Ina Grubmair and Zrinka Barišić Marenić, is summarized. The sixth chapter, *Restrained Fantasy: Expressionism in Yugoslav Architecture*, is dedicated to the analysis of this avant-garde architectural direction that stood out qualitatively in interwar Yugoslavia. By consulting the research of Zvonko Maković, Dragan Damjanović, Tomislav Premerl, and Željka Čorak, the author presented the competition projects of Drago Ibler, the founder of expressionism in Croatia. The next chapter, *One hundred and twenty-five years after the birth of Nikola Dobrović (1897-1967), the reformer of Yugoslav architecture*, was initiated by the celebration of the jubilee of the birth of academician architect Nikola Dobrović, by the Department of Art at SANU. The organization of an international scientific conference *125 years after the birth of the architect Nikola Dobrović (1897-2022)* was highlighted, at which researchers from Croatia (Marina Oreb, Krunoslav Ivanišin, Dubravko Bačić, and Antun Baće) presented.

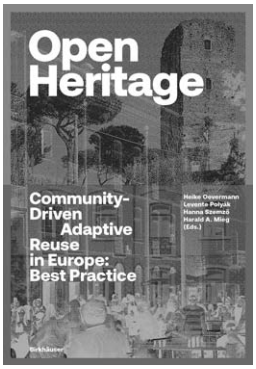
Various archival documentation on the construction of interwar Yugoslavia is classified in the eighth chapter, *Archival Documentation as a Source for Studying Interwar Construction*. This includes urban plans, conceptual architectural sketches, construction projects, drawings, photographs, technical descriptions, and more, all kept by historical archives across the politically fragmented Western Balkans. The author addresses the issue of attributing archival projects, particularly due to the practice of substitutional signing, referencing the joint research of Silvia Limani and Vanja Žanko.

Following the review of the activities of the Historical Archive of Belgrade, which serves as the centre for studying technical documentation on the capital's interwar architecture, the ninth chapter, *The Importance of the Milan Zloković Foundation*, is presented. In addition to emphasizing the importance of the foundation and the work of architect Zloković, Aleksandar Kadijević recommends cooperation with cultural and scientific institutions in the cities where Zloković designed (Zagreb, Dubrovnik, Split, Rijeka, Orebić, Osijek, etc.) to enhance the strategy for studying and protecting his works.

The final chapter, *The Appearance of the Monograph on the Architect Vojin Simeonović*, is conceived by the author to present the content and critical assessment of the monograph, which crowns the long-term efforts to showcase the design and aviation activities of the versatile architect Simeonović. Prof. Dr. Aleksandar Kadijević, through new criteria, characterization, and terminological analyses, achieves a comprehensive explanation of the crucial themes that marked the interwar architecture of the Yugoslav states. Thus, the methodologically consistent narrative of the monograph "Yugoslav Architecture between the Two World Wars (1918-1941): Contexts of Interpretation" will serve as an indispensable and valuable resource for future historiographic contributions across the entire post-Yugoslav space.

Jana Horvat

Open Heritage Community-driven Adaptive Reuse in Europe: Best Practice



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Editors: Heike Oevermann, Levente Polyák, Hanna Szemzö, Harald A. Mieg

Open Heritage: Community-driven Adaptive Reuse in Europe is a rich and comprehensive resource for those interested in the adaptive reuse and management of built heritage, particularly within community-driven contexts. Edited by Heike Oevermann, Levente Polyák, Hanna Szemzö, and Harald A. Mieg, the book presents outcomes from the EU-funded *OpenHeritage* project, which examined numerous adaptive reuse cases across Europe. With a special focus on participative planning, project financing, policies, and governance, the book addresses the need for a deeper understanding of the complexities of built cultural heritage and the diverse actors involved in its preservation and planning processes.

Serving as the basis for the book, the *OpenHeritage* project was a four-year European initiative funded by the Horizon 2020 program, involving experts from 11 countries who explored adaptive heritage reuse (AHR) in geographically, socially, and economically diverse areas across Europe. The project aimed to address challenges of reusing underused or neglected, listed, and unlisted heritage sites in a way that is both sustainable and inclusive, making it particularly relevant in today's rapidly changing urban landscapes. By establishing six Cooperative Heritage Labs and analyzing 16 Observatory Cases, the project collaborated with local communities, businesses, and authorities to experiment with new engagement methods and crowdfunding strategies. This has led to the development of adaptable models and practical tools for inclusive heritage management, in line with the EU's cultural policies aimed at fostering accessible and community-driven reuse of heritage sites.

Structurally, the book is divided into two main parts. Practical examples are laid out first in *Cases, Labs, Tools: Enabling Collaboration,* and followed by theoretical analyses, discussions, and conclusions in *Theory, Definition, and Context*.

The first part provides an in-depth examination of nine selected case studies from the *OpenHeritage* project: Cascina Roccafranca in Turin (Italy), High Street West in Sunderland (UK), London CLT (UK), Färgfabriken in Stockholm (Sweden), Stará Tržnica in Bratislava (Slovakia), Jam Factory in Lviv (Ukraine), Largo Residências in Lisbon (Portugal), Praga Lab in Warsaw (Poland), and Broei in Ghent (Belgium). Although the case studies are grouped according to three main overarching themes: *Policies and governance, Financing projects, and Supporting regional integration,* each offers a multifaceted perspective rooted in its specific cultural and regulatory environment. Together, these case studies illuminate diverse pathways and strategies that can be employed to navigate the complexities of adaptive reuse, providing practical insights for achieving sustainable and inclusive heritage management across various European contexts.

The second part of the book delves into the theoretical lessons learned from the project, embedding the findings within the broader academic discourse on heritage management. It begins by exploring the concept of *open heritage,* which challenges traditional definitions of heritage and promotes an inclusive approach to heritage management. In this context, *open heritage* emphasizes openness in three key areas: the definition of what constitutes heritage, the inclusion of diverse stakeholders in its preservation, and the processes through which heritage sites are reused. This notion of openness advocates for expanding the boundaries of heritage beyond traditional, often rigid, categorizations, allowing for a more inclusive recognition of heritage sites. The authors argue that adaptive reuse should not only preserve existing heritage values, but adapt to contemporary needs and challenges too, making heritage sites more relevant, accessible, and beneficial to society as a whole.

The second part of the book also includes a critical examination of the policies and regulations that shape adaptive heritage reuse across Europe. Specifically, the chapter on *Adaptive Heritage Reuse: Mapping Policies and Regulations* provides a detailed analysis of how national governance structures either support or hinder these projects. It underscores the importance of flexible, context-sensitive policies that can accommodate the unique challenges of each project, particularly in areas where traditional heritage practices may be less effective.

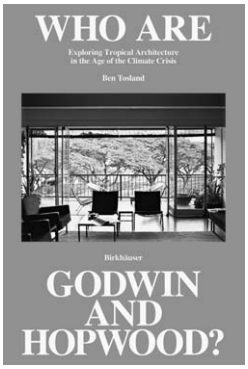
One of the key contributions of this book is the chapter on *Transferability,* which addresses the challenges and opportunities of applying successful adaptive reuse practices across different contexts. The presented *5M Model* – covering *Management, Motivation, Money, Maintenance,* and *Monitoring* – serves as a framework for evaluating the transferability of adaptive heritage reuse projects. However, the authors emphasize that while certain strategies can be adapted to new contexts, it is essential to remain sensitive to local specificities and to engage deeply with the communities involved.

The concluding chapters of the book synthesize the lessons learned from the *OpenHeritage* project, offering a comprehensive reflection on the future of adaptive heritage reuse in Europe. The authors highlight the potential of community-driven approaches to not only preserve cultural heritage but also to foster social cohesion, economic resilience, and environmental sustainability. They argue that for adaptive reuse to be truly effective, it must be underpinned by a commitment to inclusivity, transparency, and long-term engagement with local communities. This holistic approach to heritage management is presented as a blueprint for future projects, encouraging a shift away from top-down, profit-driven models toward more collaborative, community-focused practices.

In summary, *Open Heritage: Community-driven Adaptive Reuse in Europe* is a highly useful resource for anyone involved in the preservation, management, and adaptive reuse of cultural heritage. By combining practical case studies with an in-depth theoretical analysis, the book offers both meaningful insights and practical guidance for implementing sustainable, inclusive heritage projects. As urban environments continue to evolve, lessons and models presented in this book will undoubtedly serve as a valuable reference point for ensuring that our cultural heritage remains a vibrant and integral part of contemporary life.

Mojca Smode Cvitanović

Who Are Godwin and Hopwood?
Exploring Tropical Architecture in the Age of the Climate Crisis



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Ben Tosland

The discourse on modern architecture in Africa has had a dual trajectory. On the one hand, it is about the colonial practice whose system of knowledge, technological solutions and spatial syntax were imported and imposed on the encountered cultures. On the other hand, it is about the practice of emancipation, with a background of investments that strengthened the social standard capacities. Widely disseminated through programmes of colonial administrations and accepted by the post-independence governments, modern architecture was understood as a means of development. Numerous architects who have spent their working lives in southern latitudes have gone through the same historical course. Documenting the work by Godwin and Hopwood, therefore, simultaneously outlines the process of the making of modern Nigeria.

John Godwin and Gillian Hopwood, a couple who had been building a joint career since the time of their education, realized their architectural oeuvre almost entirely in the Global South. After graduating from the London's Architectural Association School of Architecture and a brief attempt to position themselves on the post-war British architectural scene, their search for stable working conditions took them to Nigeria, at that time under the British colonial rule. Acting from their home and office in Lagos, where they would eventually become naturalized, they produced an exceptionally large body of work. From the very beginning, their practice informed the widespread platform of tropical architecture, a system of knowledge by which "Western" ideas of modernism were basically adapted for the purpose of their "southern" internationalization.

The monograph provides a precise section trough the work of the practice founded in 1955 and active throughout the following decades. Set according to the typologies of selected works, the structure of the book establishes a valuable source of reference with an emphasis on the climate performability of buildings. As suggested by its name, the primary occupation of "tropical architecture" was to respond to extreme climates. Its solutions were based on the sustainability of passive systems, generally avoiding the use of air conditioning. The presentation and the analysis of the selected single-family houses, residential buildings, masterplans, buildings for industry, buildings for education and office spaces, provide applicable professional knowledge in that regard.

The extensive "Introduction" chapter of the book was written by the esteemed university professor Ola Uduku, herself a Nigerian, who also came into contact with Godwin and Hopwood's Lagosian office during her formative years. Based on her immediate experience of architecture in West Africa, as well as on her own architectural research, she verifies the relevance of their work within a broader social and cultural context. In addition to the materialization of buildings, which in themselves carried a substantial source for the dissemination of knowledge, the domain of their pedagogical and social work was of exceptional importance. Generations of younger Nigerian architects have passed through their office, thereby informing the latter's own course of professional activity.

Referring to their work as "Commercial Climaticism: The Production of Economical and Energy-Efficient Buildings", the context of Godwin and Hopwood's practice is elaborated on in the second chapter. The addressed thematic units thereby range from the foundation of practice and nature of tasks in pre- and post-independence Nigeria, the overall British architectural influence in West Africa, the organization of practice, the methodology of work and possibilities of architectural materialization, the entanglements with climate and tropical architecture in general, all the way to the political situations and the state of modernity in a country whose social conditions were continuously unstable. The social instabilities and a non-linear course of development affected their practice. Nevertheless, over the epic sixty-three years of continuous activity, the office saw hundreds of employees and developed architectural designs for over a thousand commissions.

The "Typologies" addressed in the book indicate the sets of dominant investments in the country that aspired to modernization. Most of them were carried out in the private sector, by individual or corporate developers. The effectiveness of architecture based on rationality, precision, and fast construction was inherent to the practice operative in a capitalist context. Albeit to a certain extent limited, the available materials and means of construction, as well as the accessible construction technology, were skilfully considered through both conceptualization and implementation. In contrast to the European architecture of the same generation, largely guided by the theoretical research, Godwin and Hopwood mastered the study of climate. Their projects could therefore be read as a catalogue of climate solutions for floor plans, sections and details. Certain elements such as awning windows, pivot doors, and pierced block screen wall Ð all present on the façade of their famous house and studio in Lagos Ð appear repetitively throughout their work and might be considered as emblematic to both their own practice and the tropical architecture in general.

As a "Conclusion", the multiple relevance of the architectural practice by John Goodwin and Gillian Hopwood is underlined, distinguished and succinctly explained. On the one hand, through the active position of architects in society and on the other hand, through a design methodology which prioritizes climate considerations, their lessons can be applied to the present day. While the trajectory of knowledge transfer has so far been asymmetrical, developing its pathways from north to south, learning from the experiences of the Global South is now more useful than ever. The ultimate confirmation of this fact has been given by the Canadian Centre for Architecture, where Godwin and Hopwood's archive material has been recently stored, and put at disposal for further research.

Ivan Vukojević

Urban and Architectural Complexes of Tobacco Industry in Dalmatia and Herzegovina: Criteria for Evaluation, Renewal and Revitalization

Urbanističko-arhitektonski sklopovi duhanske industrije u Dalmaciji i u Hercegovini: kriteriji za vrjednovanje, obnovu i revitalizaciju

Ivan Vukojević (born in 1990 in Čapljina, Bosnia and Herzegovina) enrolled in the Faculty of Architecture of the University of Zagreb in 2009 and obtained his master's degree in 2015, graduating magna cum laude. He is employed in a private company, where he works on architectural design tasks as a project architect.

Supervisor: Prof. Zrinka Barišić Marenić, Ph.D.
Members of the committee:
Prof. Emeritus Mladen Obad Ščitaroci, Ph.D., F.C.A. (president)
Prof. Zlatko Karač, Ph.D.
Prof. Nana Palinić, Ph.D.
Date of public defense: June 20th, 2024

The dissertation consists of two books: Book I (main text): 472 pages, 9 chapters, 39 tables, 143 illustr., 1300 footnotes, 702 bibl. units; Book II (two catalogue appendices): 441 pages.

The doctoral dissertation explores the features, significance and possible ways of renewal and reuse of former tobacco factories and tobacco processing facilities in Dalmatia and Herzegovina built in the period from the late 19th century to 1970. The tobacco industry's built heritage has multiple values and it is a significant spatial resource; however, it has mostly been in decay due to neglect and disuse. Such heritage as well as the lack of concrete research of its features and values and the lack of appropriate policies for its renewal and management were the main drivers for this research. The tobacco industry heritage should be revalorized and its renewal and reuse should be encouraged to make it an active part of contemporary life. Its preservation should be used to stimulate urban regeneration and sustainable development of the settlements and towns in which it is located. In order to achieve this, the research was directed towards defining the appropriate criteria of their renewal and revitalization.

The research was carried out by analyzing relevant literature and resources on built and industrial heritage preservation, values and renewal in order to define the theoretical framework and establish the starting points of each research phase. It was also carried out by analyzing literature and resources on the history and the features of the tobacco industry complexes in Dalmatia and Herzegovina, as well as by gathering and analyzing documented and selected case studies in two catalogues. Given that prior to this research no significant comprehensive research of the spatial development, the urban and architectural features and the values of the tobacco complexes in Dalmatia and Herzegovina had been done, this research only partially relied on the findings from previous works and was in large part based on the research of extensive original archival and documentation material, which was mostly systematized and analyzed as part of the standardized catalogue overviews in Catalogue I. Research was done on the documentation taken from the state, county and city archives and from the archives of the tobacco complexes, as well as cadastral offices, departments and branches in the towns in Dalmatia and Herzegovina, city and local heritage museums, and private archives and collections. In addition, field research was done on the sites of the tobacco complexes, where their current state was examined and architectural surveys and photographic documentation of the current state of the buildings were made. In order to explore the possible ways of renewing and reusing the tobacco buildings and complexes, in addition to the initial research of theory, catalogue analysis of selected comparative examples was made in Catalogue II.

The doctoral dissertation is divided into two books. The first book contains the main text of the dissertation and it is divided into nine chapters. The first chapter identifies the starting points and sets the research framework. The second chapter examines the historical and contemporary theoretical approaches to the preservation, evaluation and renewal of the cultural built and industrial heritage. The third chapter presents the spatial and historical development of the tobacco complexes in Dalmatia and Herzegovina. The fourth chapter defines the urban, spatial and architectural identity factors of tobacco complexes in Dalmatia and Herzegovina. The fifth chapter establishes the criteria for the evaluation of the cultural significance and the preservation of the existing physical state of the tobacco complexes in Dalmatia and Herzegovina on the basis of the theoretical starting points and on the basis of the identity and value factors. The sixth chapter establishes the planning and design criteria for the renewal and revitalization of the tobacco complexes in Dalmatia and Herzegovina on the basis of the theoretical starting points and the comparative examples of renewal and reuse in accordance with the identity factors. The seventh chapter presents a review of the goals and hypotheses set at the beginning of the research and the theoretical and practical contributions of the research. It describes the gaps observed in the research and presents the possibilities and topics for the implementation of new research as a follow-up to this doctoral thesis. The eighth and final chapter summarizes and presents the key results and conclusions of the research done as part of this doctoral dissertation. The ninth chapter contains appendices to Book I of the doctoral dissertation: the reference list, the list of illustrations, the list of tables, the list of abbreviations and a glossary.

The second book of the doctoral dissertation contains two catalogues. Catalogue I with 20 catalogue entries analyzes 21 documented tobacco complexes in Dalmatia and Herzegovina. Catalogue II collectively analyzes 60 selected foreign comparative examples of renewal and reuse of former tobacco complexes and buildings, 30 of which were the subject of subsequent detailed analysis in separate catalogue entries. The first catalogue is connected with the third, fourth and fifth chapters, and the second catalogue is connected with the sixth chapter of the Book I of the doctoral dissertation. The analytical research from the catalogue units is synthesized in the texts of the chapters.

Several original results were achieved with this doctoral research. New knowledge was gained about the spatial development as well as the historical context and the importance of construction of the tobacco industry complexes in Dalmatia and Herzegovina. The urban, spatial and architectural factors of their identity were defined. A total of 18 criteria and 21 sub-criteria were established for the evaluation of their cultural and social values, heritage properties and existing physical condition, as well as the level of cultural significance and the level of preservation of physical condition of each individual complex according to these criteria. In order to contribute to the successful renewal and reuse of the tobacco complexes in Dalmatia and Herzegovina, the research established 36 general and 36 specific planning and design criteria for further renewal and revitalization interventions, whose application should contribute to the preservation of the features and the values of the heritage, as well as to the improvement of the area where it is located.

Safete Veliu Rexhepi

Architectural Attributes of Apartment Houses Built in Pristina from 2000 until 2021

Arhitektonska obilježja višestambenih zgrada izgrađenih u Prištini od 2000. do 2021. godine

Safete Veliu Rexhepi (1987, Preševo, Serbia). She completed her studies in 2014, at the Faculty of Architecture, "Hasan Prishtina" University, Kosovo. She is a teaching assistant in the UBT college, Faculty of Architecture and Spatial Planning, in Pristina.

Supervisor: Assoc.Prof. Kristina Careva, Ph.D.
Members of the committee:
Prof. Alenka Delić, Ph.D. (president)
Prof. Art. Mia Roth-Čerina, Ph.D.
Assoc. Prof. Nikolina Vezilić Strmo, Ph.D.
Date of public defense: September 19th, 2024

The dissertation consists of two books: Book 1: 184 pages, 11 chapters, 194 illustr., 44 footnotes, 120 bibli. units; Book 2 (Appendix): 193 pages, 1 chapter, 2 illustr., 174 research tables, 3 footnotes

Housing is a phenomenon of a symbiosis between health, well-being, social and economic aspects. The importance of housing for citizens is vital, and it is an important topic in literature research. The responsible authorities globally and in Europe have continuously set norms, standards, and goals to contribute to the improvement of housing, and one of the main aims is to achieve sustainability in buildings. Urban and architectural designs are significant concepts in this study, having a key role in raising and improving the sustainability of buildings, and the quality of housing.

This topic deals with the apartment houses built in Pristina from 2000 until 2021. The definition of this research is related to the problem of the large number of apartment houses constructed during the past two decades, a period characterized by political change. After the last conflict, the city expanded almost twice in size, and apartment houses spread the most, which raised doubts about their architectural quality. The main purpose of the topic was to identify the quality of architectural attributes of apartment houses. Also, the impact of housing policies on the architectural quality of housing has been identified through research, which was carried out using the qualitative study method. In addition, to assess the condition of these buildings, a comparison was made between the spatial standards of apartment houses in Pristina and those in Croatia built through POS *(State-Subsidized Housing Construction)*. The study is based on case studies, which have been analysed using the criteria defined in the design of the catalogue forms: urban, building and apartment catalogues.

The second phase of the study is mainly based on literature review. Furthermore, the research has addressed the indicators that affect the architectural quality of apartment houses. The research begins with the review of housing policies, which has shown that housing policies have an important role in decent housing, and there are mechanisms for their improvement. The next phase of the study deals with the correlation of urban planning and the quality of housing design.

In order to assess the architectural attributes of apartment houses, criteria have been developed using the method of data collection from relevant literature for the assessment of housing. The parameters included in the study are mainly spatial, affecting the quality of life – an important factor of sustainability. The urban catalogue contains criteria that have an impact on the architectural design of buildings. The other two catalogues, for apartment houses and for the apartments, have been compiled using spatial and content criteria in terms of their function and organization. The process of collection and systematization of data was carried out using analytical, comparative and digital methods. Further research includes the impact of the law on the development of new concepts of housing construction in the city. This chapter concludes with research on the spatial standards of housing, with special emphasis on the research on the Minimum Technical Standards for Residential Building in Condominium (MTSRBC).

In addition to researching the urban and legislative issues of Pristina, the following research identifies the characteristics of the apartment houses in terms of their architecture. The research includes a cartographic study that has documented the spread of apartment houses in the city over the years. While, the morphology and typology of apartment houses were set, their definition was carried out using the data collected from study field and the bibliographic data. Founded apartments house morphologies are: urban villa, slab, tower, stepped block, complex shape block and open block. While apartment house typologies are: 3, 4, 5 or more apartments per staircase and central corridor typology. In order to have a more accurate selection of case studies, four criteria were set, which are: classification of the buildings depending on the morphology, division of periods (based on housing policy changes), availability of materials and professional reflection. In line with the criteria set for the study, 24 examples were selected and cover 136 apartment types in different neighbourhoods of Pristina within the urban area, which include examples of the two most widespread morphologies in Pristina (complex shape block and slab) for each study period. After designing the catalogues and selecting case studies, each example of the study was described.

The discussion of results is given in the next chapter, which analyses the data according to the divisions of the periods of time. The results obtained from the analysis of urban parameters have shown that in Pristina there has been an enhancement of urban parameters. Also, the architectural attributes of apartment houses in 85% of the analysed parameters have improved over the years. While, in order to assess the state of the selected examples, the architectural attributes of apartment houses in Pristina have been compared with the spatial standards determined according to the POS regulations in Croatia.

The study gathered the catalogues of case studies, defined their morphologies, filled a part of the gap in Kosovar literature and defined recommendations for the enhancement of design quality of apartment houses in Pristina, providing a professional and scientific contribution. The conclusion stemming from the research is that the architectural attributes of apartment houses in Pristina built from 2000 until 2021 were continuously improved and were assessed as satisfactory in terms of spatial standards analysed from a functional and organizational point of view. Six morphologies of apartment houses were categorized, and the most common type of dwelling is the three-room apartment. The studied urban parameters in most cases turned out to be continuously improved as well, and the continuous improvement of apartment houses over the years, based on research, has taken place thanks to legal changes (legislation, improvement of regulations, improvement of housing policies), which validates the hypothesis that housing policies have an impact on the architectural quality of housing. The applied research methodology has met the objectives of the topic, answered all the research questions, validated the hypotheses, and enabled new perspectives for further study.

Zejnulla Rexhepi

Urbanistic Criteria for Planning Privately Owned Public Spaces

Urbanistički kriteriji za planiranje javnih prostora u privatnom vlasništvu

Zejnulla Rexhepi (1986, Vranje, Serbia) graduated in 2014 at the Faculty of Architecture, University of "Hasan Prishtina", Pristina. He is currently working as a teaching assistant at UBT college and as an architect in the private architectural office "AET group" in Pristina.

Supervisor: Prof. Sanja Gašparović, Ph.D.
Members of the committee:
Prof. Emeritus Tihomir Jukić, Ph.D. (president)
Prof. Krunoslav Šmit, Ph.D.
Assist. Prof. Željka Jurković, Ph.D.
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The dissertation has: 138 pages, 10 chapters, 24 illustr., 22 tables, 46 footnotes, 128 bibl. units. The Appendix has: 41 pages, two parts, 83 illustr., 12 tables, 3 footnotes.

The research is focused on criteria for privately owned public spaces (POPS) planning. POPS are realized on private land, based on a legally determined procedure, whereby the land owners build additional square meters of the building concerning the size of the area ceded for public use. While the previous POPS research was mostly focused on individual plot realizations, the goals of the doctoral research are to determine the possibilities of POPS urban planning and to highlight the benefits established by systematically planned POPS implementation at the city scale.

The research starts from the following questions: What spatial characteristics (of the city) affect the density and quality of POPS? Is it possible to control and improve the application of POPS, as well as its benefits, in a wider context of the city?

After an introductory overview of the origins and development of the world's POPS, the review and synthesis of scientific and professional sources indicated the differences in the POPS defining and determined two basic groups of POPS definition aspects: urban/spatial aspects and aspects of responsibilities and rights. A conducted synthesis of sources, dating from 2000 to 2023, identified the deficiency in POPS research from an urbanistic point of view determining it as a significant research gap and as one of the key incentives for the doctoral thesis.

The classification of POPS in the cities, with publicly available systematic databases and precise guidelines for POPS implementation (New York, Hong Kong, San Francisco and Seattle), determined no consensus in typology and introduced the new generalized POPS classification into six main POPS types, depending on spatial characteristics.

Urban characteristics of the POPS implementation were analyzed in detail on examples of New York, Hong Kong, San Francisco and Seattle and the districts with the highest density or number of POPS. A synthesis of different data sources (digital maps from open city databases, administrative city divisions; population density; spatial planning documents; legal documents and scientific research) introduced a graphic analytical modular grid method, which pointed out a predominant POPS location in the planned central or main (Downtown), predominantly business and commercial, urban districts with a recognizable urban identity, while location is only partially related to the oldest historical districts. It was indicated that high POPS density corresponds to the urban morphology of high-rise high-density areas located often near famous (iconic public) buildings of unique identity, near well-known open public spaces (parks), along the city's coastal areas and/or along the city's main avenues.

Established urban features indicative of high-density areas of implementation confirm that POPS can be associated with urbanity, centrality and urban identity, which proves the possibility of determining the urban characteristics of city areas suitable for the POPS method application.

A synthesis of the European Commission and UN-Habitat documents and scientific sources, relevant to qualitative impacts of public spaces, determined four categories with a total of eight criteria that can influence the quality of public open spaces at the district or city level: criteria of distribution and representation, location criteria, criteria of the program and criteria of interrelationship.

From researching 392 New York POPS, a comparative analysis of four selected zones (neighborhoods) was concluded with determining five quantitative and four qualitative impacts referring to physical and functional urbanistic aspects resulting from the overall realization of all POPS.

The urbanistic impacts, determined by specific changes in (inter)relations of public spaces, use and/or perception of the zone, confirmed the benefits of POPS implementation in a wider urban context. The research of the zones also revealed four recognizable principles of urbanistic POPS implementation: a network of passages, a dispersed system of plazas, a park of the zone and a pedestrian street.

From the synthesis of previous steps, eighteen urbanistic criteria relevant to POPS planning at three urban scales (city, district, zone) have been established. Four criteria defined at the general city level, based on the common urban characteristics indicating the POPS application suitability, can be applied as a guideline for determining city areas where the POPS implementation should be permitted/encouraged. Five criteria relevant to district-level planning, derived from the most common spatial characteristics of the highest POPS density areas, can be applied in determining urban morphology characteristics indicative for POPS implementation. Five quantitative and four qualitative criteria for the POPS planning at the neighborhood scale, derived from the detected urban impact of POPS in specific zones, can be applied in systematic planning of specific network principles of POPS and improving the qualitative characteristics of zone in terms of functionality, design and experience.

This confirmed that based on the evaluation of the urban impact of POPS on the city, it is possible to establish criteria for their systematic planning and the quality of public spaces and the city. By analyzing and comparing the established criteria, at the level of the analyzed zones, four principles of implementation of the POPS system were determined, that is, their method of influence at the level of the network of public spaces was determined, which affects the improvement of the qualitative characteristics of the city area in terms of functionality, design and experience.

The overview scientific contribution of the research is reflected in the systematization of previous knowledge, the clarification of the fundamental definition aspects and the typological classification of POPS. The original scientific contribution in methodology is achieved by researching the spatial features of POPS at three levels – city, district and zone, and in defining criteria for their systematic and integral urban planning, which achieves qualitative and quantitative contributions to the development of the city, especially its system of public spaces.

Maja Bilušić

Urban Renewal Planning Criteria for Small Historic Towns in Croatia

Kriteriji za planiranje urbane obnove malih povijesnih gradova Hrvatske

Maja Bilušić (1985, Zagreb), employed at the Institute of Art History in Zagreb. She graduated from the Faculty of Architecture at the University of Zagreb in 2011 with her thesis „Possibilities for the Transformation of the Fortica Peninsula in the Town of Vis".

Supervisor: Prof. Zlatko Karač, Ph.D.
Members of the committee:
Prof. Damir Krajnik, Ph.D. (president)
Assoc. Prof. Marko Rukavina, Ph.D.
Tatjana Lolic, Ph.D.
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The dissertation has 385 pages, 33 images, 16 tables, 3 diagrams, 2 cartographic representations, and 54 catalog entries. The dissertation is equipped with 791 footnotes. The Appendices has 392 bibl. entries, 91 documentary sources, and 65 online sources.

Small historical towns are an important factor in the spatial identity and urban tradition of Croatia. Croatia is a country with a long urban tradition developed continuously from ancient times to the present day. Today, numerous small historical towns are faced with the deterioration of their historical, urban and architectural features, and consequently with changes in their urban identity. According to the spatial planning legislation and the Ordinance on Spatial Plans, there is no obligation to create an urban development plan for cultural and historical entities that also include small historical towns. The hypotheses of this research are: small historical towns differ according to their identity characteristics, that is, their urban character; the criteria for planning the urban renewal of a small historical town, apart from the general ones, depend on the identity characteristics of an individual town, and by applying the criteria for urban renewal planning, the identity characteristics of small historical towns can be preserved and improved.

The main goal of the research is to analyze and supplement the existing criteria for planning the urban renewal of cultural and historical entities to which small historical towns belong by preserving their identity features and heritage values. Other goals are the conceptual definition and determination of criteria for recognizing small historical towns in Croatia and their listing; systematization of methods of assessment (evaluation) of identity features of a small historical town and systematization of criteria for urban renewal planning based on the assessment of the state of identity features. In the scientific and research process, which fulfills the research objectives and proves the set hypotheses, inductive and deductive methods, archival research, field research, model-making methods, mathematical and statistical methods, comparative analysis methods and synthetic interpretation methods are used.

In the first chapter, by analyzing bibliographic units and documentation sources of international organizations that deal with cultural heritage and urban planning, basic data is researched in order to more precisely define terms related to definitions and criteria for recognizing and evaluating urban character (identity features) in the context of urban morphology. Contemporary approaches and theoretical starting points for methods of protection, planning and management of historical cities are explored, especially within the framework of the concept of historical urban landscape.

The second chapter analyses bibliographic units that research international and domestic examples of urban heritage protection in the period from the second half of the 19th century to the present day. The research is focused on the analysis of applied methods, procedures and planning criteria in the period after the establishment of the institutional heritage protection system. Examples of plans for the regulation and restoration of historical parts of cities created during the last century, as well as recent urban renewal plans and management plans for European and Croatian historical cities, are investigated. Through a comparative analysis of applied models and methods of protection and restoration of urban heritage, the goal is to determine their general principles and approaches as one of the starting points for the proposal of criteria for planning the protection and restoration of small historical towns in Croatia.

The third chapter deals with the determination of small historical towns in Croatia. Although it is often used, there is no unequivocal definition of the term small historical town, nor are they clearly recognized or mentioned in the legislation. The initial research was to determine the criteria for determining a small historical town and to determine a list of small historical towns. The proposed multi-criteria model for the recognition of small historical towns includes the verification of administrative, functional, size, conservation, historical and structural and morphological factors.

In the fourth chapter, the criteria for identifying the identity features of small historical towns are proposed, established on the theoretical basis of urban morphology and historical urban landscape. The model of recognition and evaluation of the degree of significance of their identity features was carried out for forty-four small historical towns in Croatia, which are analyzed and evaluated according to the degree of physical, evident identity: spatial-landscape, visual-morphological, urban-architectural and heritage. The analyses are focused on the physical appearance of the city and its material forms in three dimensions and within the framework of its historical development as a historical identity. The proposed model of recognition and evaluation of the city's identity features according to selected criteria based on quantification indicators results in a synthesis evaluation of the degree of identity significance, which is evaluated within the following categories: high, medium/moderate and low. Korčula, Motovun, Ston, Labin, Motovun, Pag, Rab, Buje, Buzet, Grožnjan and Oprtalj were assessed as having a high degree of identity significance.

In the fifth chapter, in the example of the cities selected according to the criterion of the degree of significance of identity features, the criteria important for planning are analyzed, namely the indicators of the assessment of the state of: structural and morphological, socio-economic, spatial, landscape and ecological and planning and urban criteria. Indicators of danger (threats) and potential (opportunities) for development are added. Depending on their assessment, the following criteria are foreseen in future planning: preservation and maintenance, improvement and advancement of identity features and introduction of new structures and content. The application of an intersectoral model of planning and management of urban heritage is also proposed, and must be integrated into the broader framework of development planning as well as the model of integral planning and the connection of urban planning and preservation of urban heritage. It is concluded that it is necessary to oblige the creation of an urban development plan for the area encompassing cultural and historical entities, also including small historical towns.

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