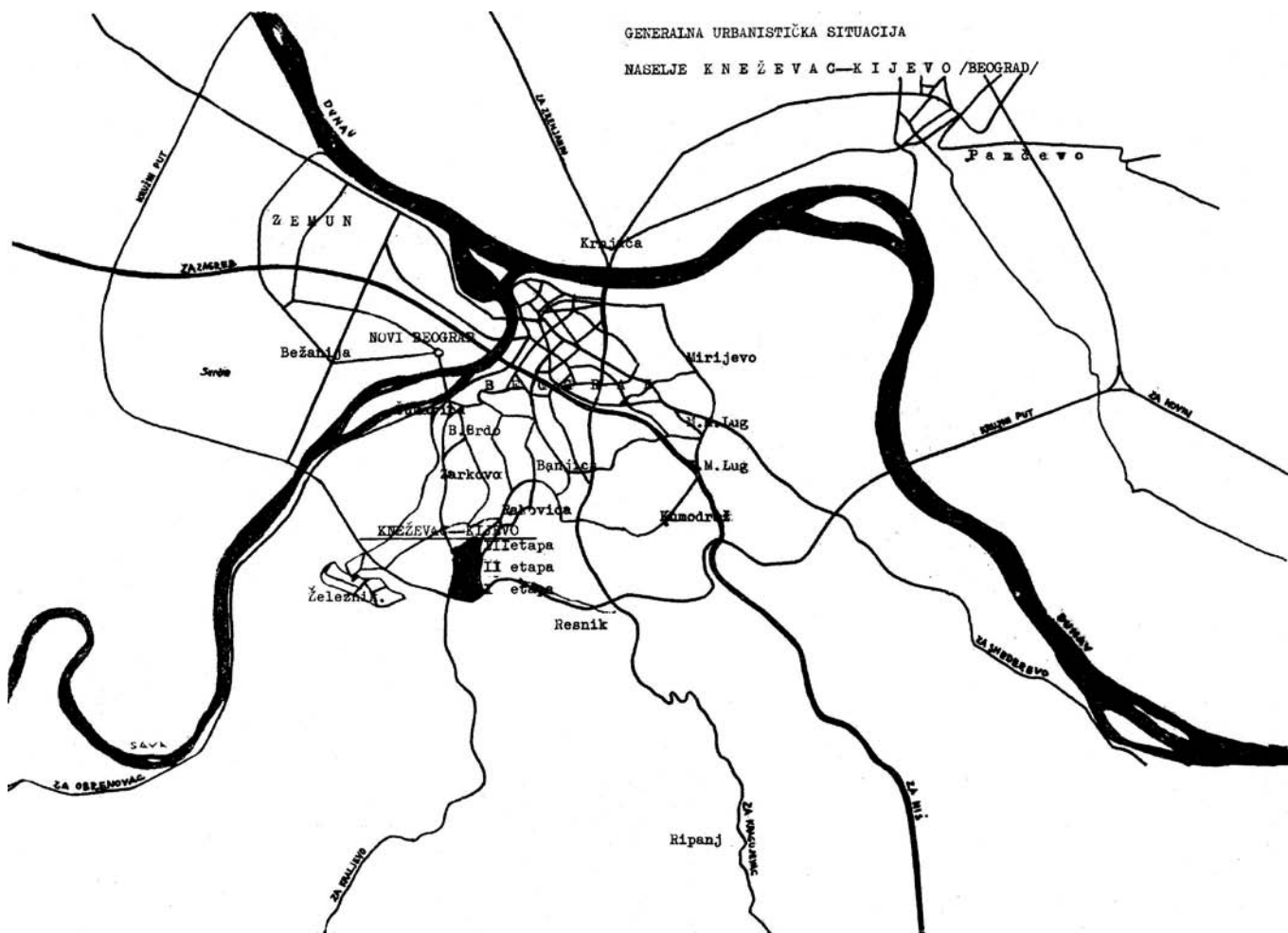




LOCATION MAP

MAPA LOKALITY

Source Zdroj: courtesy
 of Branislav Milenković

The Problem of the House in 1960s Belgrade: Mediating the Individual and the Collective

Problematika bývania v šesťdesiatych rokoch 20. storočia v Belehrade: sprostredkovanie individuálneho a kolektívneho

Petar Cigić, Ljiljana Blagojević

Štúdia overuje „problém domu“ (Le Corbusier, 1923), tak ako sa vyvinul v socializme v bývalej Juhoslávii. Skúma prípad typológie rodinných domov nízkopodlažného, zahusteného sídliska Petlovo Brdo, postaveného 1967 – 1969 v Belehrade. Navrhli ho urbanisti Jovan Lukić a Mirjana Potkonjak z Kancelárie mestského plánovania mesta Beograd, v spolupráci s nezávislými architektmi Elsou a Branislavom Milenkovićom, ktorý navrhl všetky domy. Petlovo Brdo bolo postavené ako prvá fáza rozsiahlejšieho sídliska Kneževac-Kijevo v periférnych oblastiach vzdialených približne 12 kilometrov od centra Beogradu. 75 ha plocha Pelovho Brda obsahuje približne 1 750 bytov pre 6 650 obyvateľov – z toho 60 % nízkopodlažných rodinných domov a 40 % stredne vysokých bytových domov kolektívneho rázu s približne 12 ha športového a rekreačného vybavenia a vymedzenými plochami pre dopravu a pohyb. Kvôli udržaniu dostupných cien pre ľudí s nižšími príjmami bol návrh Petlova Brda založený na maximalizovaní hustoty zástavby a minimalizovaní stavebných nákladov. Parafrázujúc dobový komentár, dôraz treba klásť na racionalitu návrhu, teda myšlienku typizácie a plánovanej výstavby rodinného bývania zohľadnený v praktickej rovine plánu, súčasne sa však má podriaďiť rytmu a disciplíne urbanistických a architektonických koncepcií (Bjelikov, 1969). Sídlisko obsahujúce varietu dostupných bytov v rôznorodých urbánnych zostavách dosiahlo napokon priemernú hustotu 169 – 175 obyvateľov na hektár s 55 – 65 m² zelene na obyvateľa, respektíve hrubú priemernú hustotu 105 – 115 obyvateľov na hektár zodpovedajúcu čistej hustote 181 obyvateľa na hektár a 50 m² zelene na obyvateľa v rodinných domoch a 147 obyvateľov na hektár v štvorposchodových bytových domoch v okrajových častiach.

Sociálno-priestorové variácie nízkopodlažnej typológie Petlova Brda boli dosiahnuté prostredníctvom kombinovania siedmich bytových typov a ich rôznorodých zoskupovaní v malých susedstvách s bezprostrednou pešou dopravou. Štúdia tvrdí, že špecifické zdôvodnenie variability vychádza zo zanieteného dlhodobého výskumu bývania a urbánnosti Branislava Milenkovića, v tomto prípade z racionálneho navrhovania bývania a výstavby v mestských perifériách, ktoré možno nazvať súčasnou ľudovou architektúrou, ako sám architekt veril.

Folklorne a periférne sú pre mňa dva hlavné výstupy, ktoré prúdia jeden medzi druhým. (Milenković, 1986) Článok predostiera, že zdroj sociálno-priestorovej kvality sídla Petlovo Brdo vychádza zo širšieho profesionálneho a akademického diskurzu obdobia, ktoré sa zaoberalo vzťahom architektonického výskumu a navrhovania, alebo presnejšie povedané zo súčasnej teórie navrhovania. Teoretické snahy o metodológiu navrhovania, ktoré by, ako v prípade Petlova Brda, bola užitočná pre zladenie

urbánnych a architektonických mierok a pre otvorenie hraníc medzi disciplínami smerovali k pochopeniu sociálnych praktík, predovšetkým v každodennom živote obyvateľov sídla. Branislav Milenković tvrdil, že aktuálnou teoretickou témou je samotný vzťah programových princípov architektúry k téze Henriho Lefebvra o priestorovom skúmaní, teda o sociálne produkovanom (sociálnom) priestore. Možno konštatovať, že Petlovo Brdo architektonicky stelesňuje túto čisto teoretickú tézu a prostredníctvom typologickej a programovej inovatívnosti situuje architektúru ako disciplínu do vzťahu ku každodennej sociálnej produkcii priestoru v socializme.

Od ukončenia štúdia na fakulte architektúry v Belehrade v roku 1951 sa Milenković zaoberal výskumom navrhovania a realizáciou bývania, organizáciou funkčných skupín v súčasných bytoch a špecifickými ekonomickými, sociologickými, hygienickými a architektonickými aspektmi projekcie pre rôzne spoločenské skupiny obyvateľov. Podieľal sa na mnohých výskumných expedíciách ľudového vidieckeho a mestského dedičstva v strednom a južnom Srbsku, v Kosove a v severných častiach Macedónska. V dekádoch, pred projektom Petlovoho Brda, sa Milenković zúčastnil na viacerých výskumných projektoch v rámci rôznych inštitúcií Srbskej republiky, ako napríklad: *Návrh malých obytných budov*, v Inštitúte hospodárstva v rokoch 1954 – 1957; *Výskum ľudového dedičstva*, Federálneho inštitútu na ochranu kultúrnych pamiatok, Inštitúte pre ochranu kultúrnych pamiatok autonómnej oblasti Kosovo a Metohija a Etnografickom ústave srbskej akadémie vied, v rokoch 1954 – 1964; *Problémy vidieckych osád*, v Ústave hygieny, 1959; *Súčasný bývanie vo vidieckych oblastiach*, v Inštitúte zlepšovania domácností, v rokoch 1959 – 1960; *Metodika modulárnej koordinácie v projekte*, v Rade pre modulárnu koordináciu a v Centre zdokonaľovania výstavby – Federálnej stavebnej komory, v rokoch 1959 – 1961; a na Štúdiu minimálneho štandardného bývania, na Ústave pre architektúru a urbanizmus, v rokoch 1965 – 1968. Elsa Milenković bola zamestnaná v profesionálnych dizajnerských kanceláriách, kde navrhla veľké množstvo architektonických projektov a realizovala niekoľko budov a komplexov ako vedúca architektka. Kombinácia skúseností oboch architektov sprostredkovala širokú vedomostnú základňu, ktorú využili pri navrhovaní Petlovoho Brda.

Keď si to zhrnieme – v Petlovom Brde bola použitá metodológia návrhu pomocou modulárnej koordinácie v kombinácii s koncepciou využiteľnosti plochy bytov z hľadiska funkčne dispozičného rozvrhu, klimatických a estetických vlastností domáceho a mestského prostredia. Bytové jednotky boli organizované a dimenzované presne v súlade s návrhom mestských

blokov a stanovením rozmerov jednotlivých pozemkov, čo viedlo k vytvoreniu vysokej hustoty sídliska pre tento typ osídlenia a vzniku fyzickej štruktúry dostatočne flexibilnej na prispôsobenie existujúcej dopravnej siete. Proces návrhu bol ďalej vylepšený priamym kontaktom s potenciálnymi obyvateľmi, ktorí mali možnosť zúčastniť sa na finálnych fázach návrhu a výstavby. Teda po výbere bytu na základe plánu lokality a úvodného katalógu bytových typov mali kupujúci možnosť realizovať zmeny návrhu podľa ich konkrétnych potrieb v spolupráci s architektmi. Tí poskytli žiadané zmeny v návrhu bezplatne počas dvoch rokov výstavby domov. V nedávnom rozhovore s autormi architekt pripomenul, že zmeny boli primárne zamerané na rozšírenie obytnej plochy o podkrovia, navrhovanie skladových priestorov v suteréne alebo doladovanie funkčného riešenia podľa konkrétnej štruktúry rodiny. Vede to k záveru, že vysoký podiel účasti užívateľov pri navrhovaní Petlovo Brda súvisel najmä s architektonickými vlastnosťami projektu samotného a predovšetkým s hlbokým pochopením architektonickej disciplíny vo vzťahu k iným spoločenským praktikám v oblasti bývania.

Branislav Milenković vo svojej doktorskej práci vytvoril metodologickú štruktúru výskumu architektúry, ktorá navrhuje programové princípy architektúry ako súhrn skúseností súvisiacich s produkciou priestoru, najmä skúseností každodenného

života užívateľov architektúry a urbánneho priestoru. Vychádza z interakcie medzi interdisciplinárnym bádanim a architektonickým výskumom navrhovania, ktoré nazýval „podmienkami telesnej a spoločenskej existencie ľudí“, mala Milenkovičova štúdia programových princípov architektúry (1977) poskytnúť „odpovede na životne dôležité otázky organizácie a navrhovania fyzických štruktúr“ s orientáciou na ich budúci rozvoj. Táto budúcnosť sa mala týkať objavovania nových „priestorových jednotiek a zoskupení“ alebo „priestorových úrovní“, ktorých fyziognómia „nemusí byť v súlade s našim súčasným chápaním toho, čo je mesto, dedina, osada a podobne“, ale je určená „zmenami životného rytmu a potrieb“. Milenkovičov návrh „dvojsmernej línie vplyvu“ medzi fyzickou štruktúrou a každodenným životom nás vedie k pochopeniu jeho teórie architektonickej disciplíny. Teda, že samotná architektúra prispieva k spoločenskej praxi prostredníctvom objavovania fyzických štruktúr a k organizácii orientovanej na nové prvky v priestorovej praxi. Na záver by sme chceli predostrieť, že teórie navrhovania aplikované na Petlovom Brde, v socialistickej obytnej krajine šesťdesiatych rokov 20. storočia v Srbsku, ktorá bola rozdelená medzi individuálne motivovaný neformálny rozvoj prímestských aglomerácií a centrálné plánované satelitné sídliská, vytvorili ojedinelú sociálno-priestorovú rovnováhu medzi jednotlivcom a komunitou.

Introduction

This article explores a case of low-rise, high-density single-family housing typology developed during the period of the socialist system in Belgrade, in the former Yugoslavia. Generally speaking, affordable single-family housing figured to a lesser extent in socialist states than in the counterpart welfare states of Europe, subsequently leaving fewer options and precedents for diversification of urban morphologies in the socio-spatial restructuring of the post-socialist period. For instance, single-family housing was completely omitted in the planning of New Belgrade, a project that figured as one of the most prominent post-war enterprises in socialist Yugoslavia from 1946 well into the 1980s.¹ Housing typology based on the idea of individuality, that is to say the ideal of a house with a garden, was marginalized relative to the dominant collectivist spirit and the subsequent mid- and high-rise typologies, with housing architecture and urban group-forms often symbolically expressing the achievement of building socialism and the socialist lifestyle.²

This article aims to examine ‘the problem of the house’,³ as it evolved in the socialist framework, by focusing on a close analysis of the estate Petlovo Brdo in Belgrade. Planned by the urbanists Jovan Lukić and Mirjana Potkonjak of the City of Belgrade Urban Planning Office, in collaboration with the independent architects Elsa and Branislav Milenković,⁴ Petlovo Brdo was designed and constructed in 1967 – 1969 as Phase 1 of the larger housing estate Kneževac-Kijevo, in the peripheral zone some 12 km southwest from the centre of Belgrade. The 75 ha area of Petlovo Brdo comprises ca. 1,750 apartments for 6,650 inhabitants – 60 % low-rise single-family and 40 % mid-rise collective housing typology – with some 12 ha of sports and recreation facilities and dedicated areas for traffic and circulation.⁵ The article contends this case to be significant as a socio-spatially produced urban form exemplary of architectural and urban practice that evolved from research and in response to the demand for rationality.

Low-rise housing in Petlovo Brdo is comparable to similar typologies in European welfare states, especially Scandinavia, and the former socialist Yugoslavia. As William Curtis notes, the Kingo Houses near Elsinore (1956 – 1960) or the terrace houses in Fredensborg (1962 – 1963), both designed by Jørn Utzon, ‘disposed this standard (that is, single house typology) in variety of different ways over the topography to create a hierarchy between the individual home and the community’.⁶ Such socio-spatial qualities were often quoted by Yugoslav architects who published Scandinavian examples and lectured on the achieved level of social space.⁷ For instance, in his lectures and in his doctoral thesis, Branislav Milenković comparatively considered typological continuities between

apartments byty	1 room 1-izbový	1.5 rooms 1,5-izbový	2 rooms 2-izbový	2.5 rooms 2,5-izbový	3 rooms 3-izbový	total no. celkový počet	inhabitants obyvatelia
	202	226	518	513	290	1,749	6.656

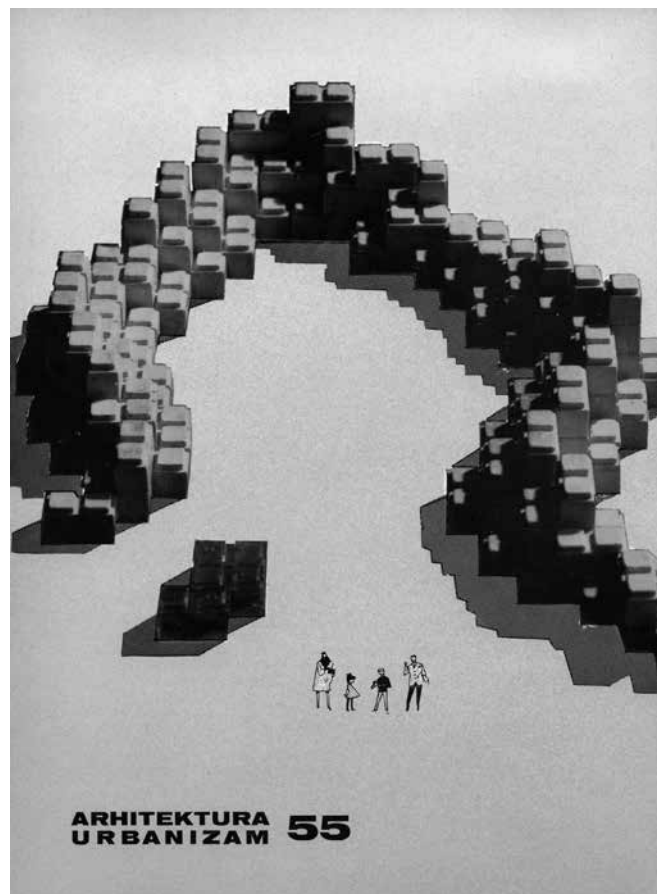
STRUCTURE OF APARTMENTS

ŠTRUKTÚRA BYTOV

Source Zdroj: MILENKOVIĆ, Branislav:
Naselje Kneževac Kijevo, p. 27

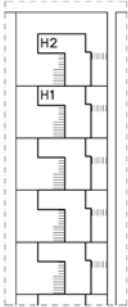
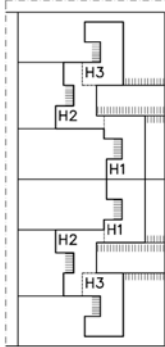
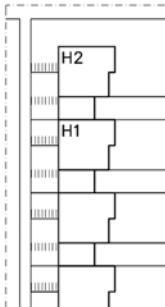
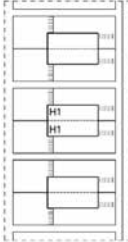
THE BELGRADE ARCHITECTURAL JOURNAL ARHITEKTURA URBANIZAM, NO. 55, 1969, COVER DESIGN BY VLADIMIR BJELIKOV

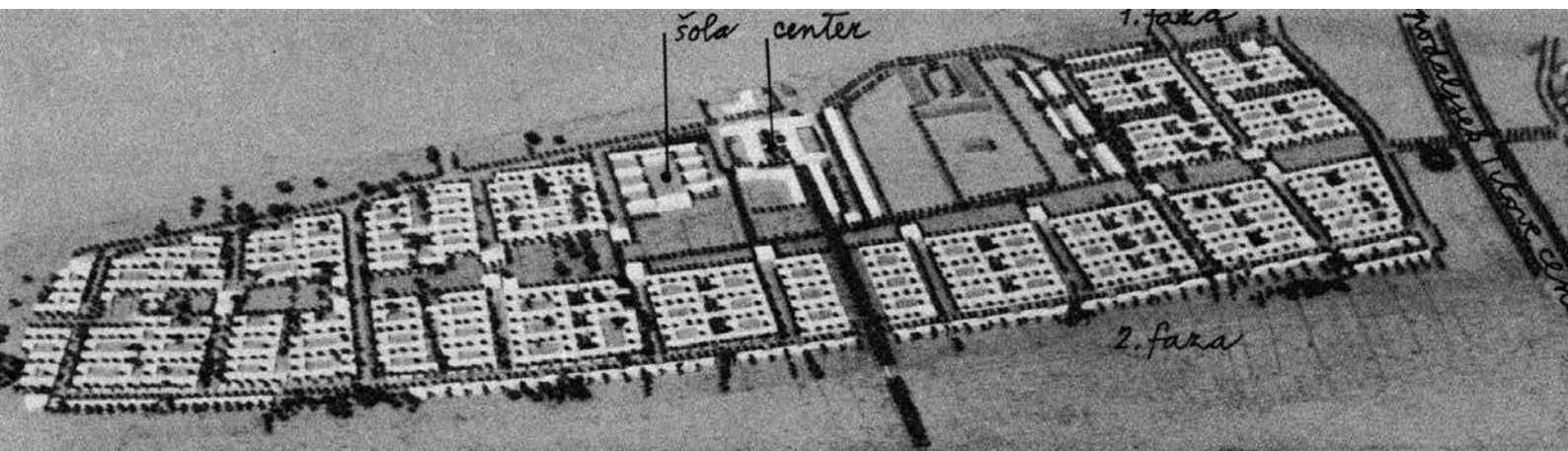
TITULNÁ STRÁNKA
BELEHRADSKÉHO
ARCHITEKTONICKÉHO ČASOPISU
ARHITEKTURA URBANIZAM, 55,
1969, PODĽA NÁVRHU VLADIMIRA
BJELIKOVA



the atrium house in Petlovo Brdo against the more illustrious examples of Mies van der Rohe's house with three courtyards (1934), Fredensborg housing and the historical monastery quarters of Certosa di Pavia (1481).⁸ In Slovenia, the architect couple France and Marta Ivanšek,⁹ graduates from the University of Ljubljana who specialized in Sweden in the late 1950s, articulated a notable critique of the monotony of modernist collective housing and the lack of response to the population's preferences and aspirations to live in individual houses. Basing their argument on interviews and questionnaires involving residents of typical open-block, mid- to high-rise modernist housing, they contended that the single-family house was unequivocally the single preferred option for the majority of Slovenians.¹⁰ Such examples of sociological and architectural research and the ongoing restructuring of economy in the mid-1960s, most notably the housing reform of 1965, brought about alternative housing such as low-rise high-density single-family typologies. Vladimir Bjelikov (b. 1925, Belgrade – d. 2014, Belgrade), architect, professor of urban planning and, at the time, editor of the thematic issue on housing of the leading Belgrade architectural journal *Arhitektura urbanizam*, welcomed the trend of 'recent researches in the world aiming at subordinating the arbitrary stores of human insulation incubators to the idea and the need to define and articulate open space, at the same time decomposing the overall constructive mass into structural units proportionate to man'; he also offered its visualisation of this on the magazine's cover.¹¹

TYPOLOGY OF LOW-RISE HOUSING, IN PETLOVO BRDO SETTLEMENT
 TYPOLOGIA NÍZKOPODLAŽNÝCH DOMOV, V SÍDLISKU PETLOVO BRDO

low-rise type typ nízkopod- lažného domu	organization of plots riešenie pozemku	houses domy	total no. celkový počet	plot area m ² plocha pozemku m ²	house footprint m ² zastavaná plocha m ²	plot occupation index % ukazovateľ zastava- nosti pozemku %
T1 single-family row houses T1 rodinný dom v radovej zástavbe		H1 – row house with three-room apartments (A1) H1 – radová zástavba s trojizbovými bytmi (A1)	119	255.60	93.74	36.67
		H2 – corner house with a three-room apartment (A1) H2 – nárožný dom s trojizbovými bytmi (A1)	96	340.80	93.74	27.53
T2 group of six single-family houses T2 skupina šiestich rodinných domov		H1 – row house with three-room apartments (A2) H1 – radová zástavba s trojizbovými bytmi (A2)	52	343.99	91.53	26.61
		H2 – row house with two-room apartments (A3) H2 – radová zástavba s dvojizbovými bytmi (A3)	52	296.12	81.27	27.44
		H3 – corner house with three-room apartments (A2) H2 – nárožný dom s trojizbovými bytmi (A2)	52	448.15	91.53	20.42
T3 extended-family row houses T3 dvojgeneračné radové zástavby		H1 – row house with a one-and-a-half-room apartment (A4) and a two-room apartment (A5) H1 – radový dom s jedenapol izbovým bytom (A4) a dvojizbovým bytom (A5)	197	333.75	115.92	34.73
		H2 – corner house with one-and-a-half-room apartment (A4) on the ground floor and two-room apartment (A5) on the first floor H2 – nárožný dom s jedenapol izbovým bytom (A4) na prízemí a dvojizbovým bytom (A5) na poschodí	130	433.75	115.92	26.72
T4 multi-family freestanding extended house T4 viacrodinný samostatne stojaci dvojdom		H1 – house with a one-and-a-half-room apartment (A6) on the ground floor and two-and-a-half-room apartment on the first floor (A7) H1 – dom s jedným jedenapolizbovým bytom (A6) na prízemí a dvojizbovým bytom (A7) na poschodí	28	varies ca. 360 – ca. 720 variabilné cca 360 – cca 720	134.96 (67.48)	18.67



FRANCE IVANŠEK: MURGLE ESTATE,
LJUBLJANA, 1965

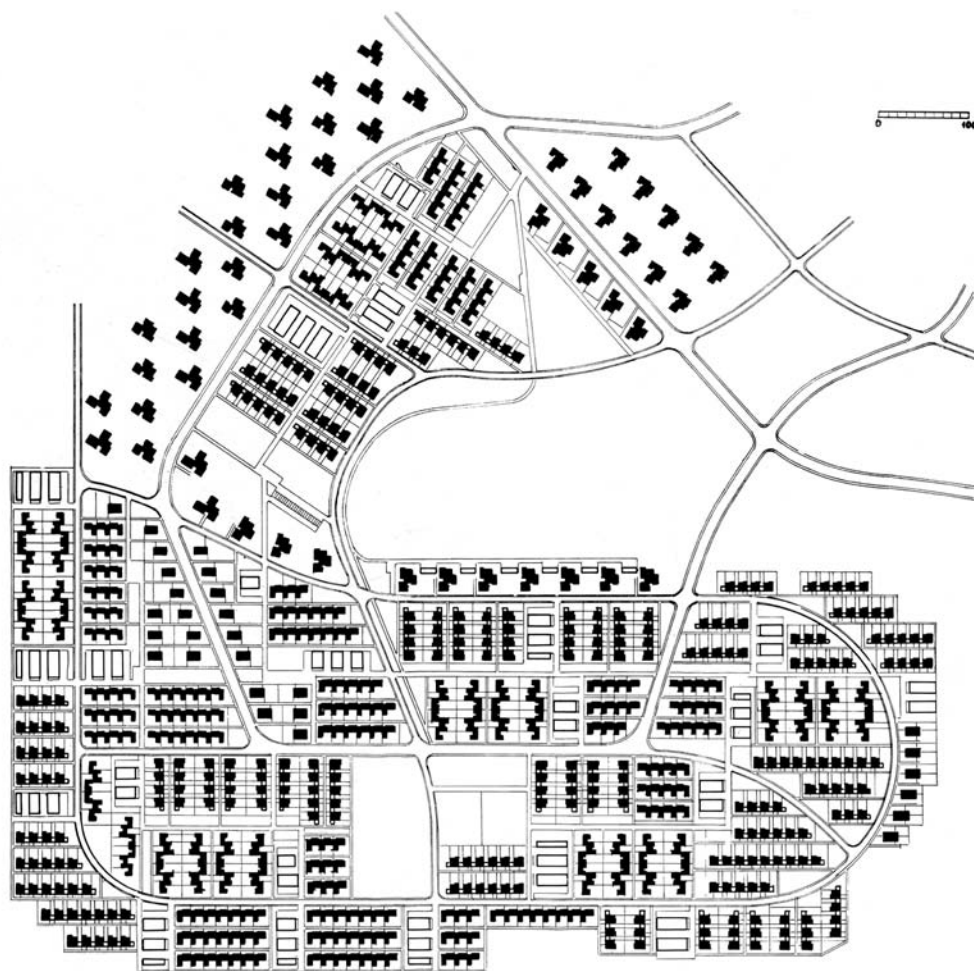
FRANCE IVANŠEK: ŠIDLISKO
MURGLE, LJUBLJANA, 1965

Source Zdroj: Stambeno naselje Murgle,
Ljubljana. Arhitektura urbanizam, 1969,
55, p. 22

The first such settlement realized in Yugoslavia was Murgle in Ljubljana designed by France Ivanšek in 1965 in collaboration with his wife Marta. Hailed by Bjelikov as a welcome 'example of full urbanization of the family dwelling' when built in 1969,¹² Murgle developed over the decades to be one of the most successful and desirable residential quarters in the city to this day.¹³ In Serbia, the architect couple Milenković designed Petlovo Brdo as an urban periphery, colloquially dubbed the estate of poor-man's villas; it still remains a singular enclave of its kind in the greater metropolitan area of Belgrade. While the first phase of Murgle consisted of one story single-family terraced houses grouped in rows along straight pedestrian streets, Petlovo Brdo achieved a socio-spatial variation from the very outset by means of combining seven apartment types in four house types and their diverse grouping in immediate small neighbourhoods with pedestrian circulation.¹⁴ The specific rationale of variability, we argue, comes from Branislav Milenković's long-term commitment to the study of dwelling and urbanity and, in this case, the rational residential design and construction in the urban periphery, that is to say, the contemporary vernacular, as the architect himself believed: The folkloric and the peripheral are, for me, two main outcomes that flow one from another.¹⁵

Housing Policy and Planning

Urban housing was a pressing social issue throughout the post-war period in Belgrade, its strategies changing over time closely following phases of political change and socio-economic development. In the turbulent years of political instability and material scarcity between 1945 and 1950, the housing crisis arose with massive migrations of the population to the major urban centres of insufficient absorbing capacity, war-devastated existing housing stock, and state investment that prioritized industrialization over urbanization.¹⁶ Investment in housing increased with the societal shift towards self-management, introduced by the Constitutional Law of Yugoslavia in 1953. Conse-



BRANISLAV AND ELSA MILENKOVIĆ
(ARCHITECTURAL DESIGN) IN
COLLABORATION WITH JOVAN
LUKIĆ AND MIRJANA POTKONJAK
(URBAN DESIGN): PETLOVO BRDO
ESTATE, SITE PLAN, 1967

BRANISLAV A ELSA MILENKOVIĆ
(ARCHITEKTONICKÝ NÁVRH)
V SPOLUPRÁCI S JOVANOM
LUKIČOM A MIRJANOU POTKONJAK
(URBANISTICKÝ NÁVRH): PETLOVO
BRDO ESTATE, SITUAČNÝ PLÁN, 1967

Source Zdroj: MILENKOVIĆ, Branislav:
Naselje Kneževac-Kijevo. Arhitektura
urbanizam, 1969, 55, p. 26

apartment type typ bytu	no. of rooms počet izieb	net living area m sq. čistá bytová plocha m ²	covered outdoor space area m sq. krytá vonkajšia plocha m ²	net garden area m sq. čistá plocha záhrad m ²	auxiliary room's area m sq. pridaná plocha izieb m ²
A1	3	72.50	24.33	144.85 [H1] 247.06 [H2]	17.77
A2	3	71.56	12.39	244.85 [H1] 349.13 [H3]	27.93
A3	2	59.99	12.39	210.94	27.93
A4	1.5	56.49	7.87	122.33 [H1] 222.33 [H2]	7.35
A5	2 – 2.5	61.56	22.95	95.50	11.96
A6	1 – 1.5	41.91	5.25	115.40	14.54
A7	1.5	42.42	10.08	178.03 [varies] [kolíše]	10.08

APARTMENT TYPES IN LOW-RISE HOUSING

TYPY BYTOV V
NÍZKOPODLAŽNÝCH
DOMOCH

**PETLOVO BRDO HOUSES UNDER
CONSTRUCTION (TYPES T1 AND T3)**

DOMY PETLOVHO BRDA POČAS
VÝSTAVBY (TYP T1 A T3)

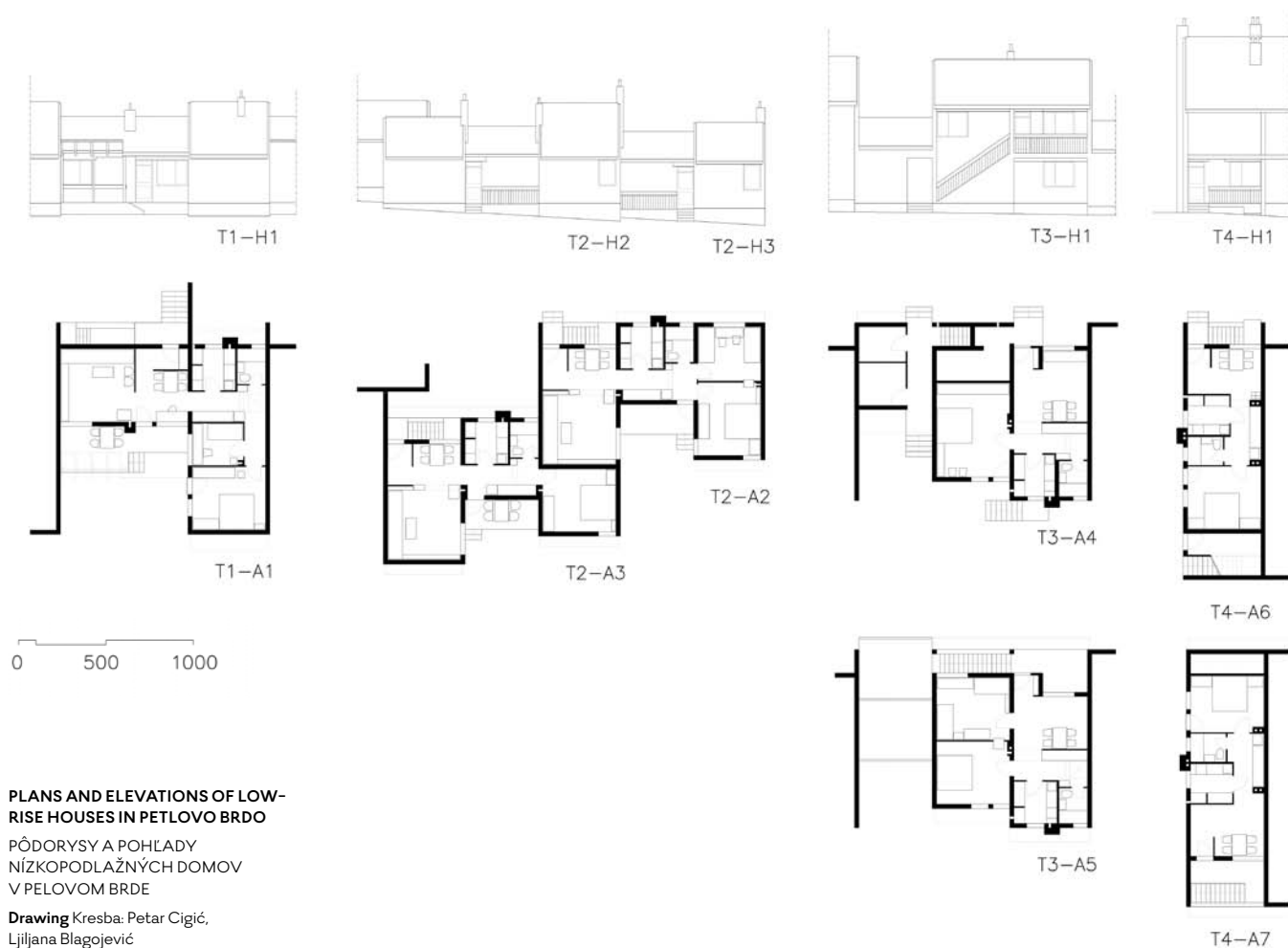
Photo Foto: courtesy of
Branislav Milenković



quently, in 1957, the legislation on local authorities' rights to communal self-management empowered municipalities in terms of issues such as communal urban planning, and gave them related financial decision making powers previously held only by the federal or republic levels. In effect, local authorities acquired decision making power over questions of priority development planning and financing, and economic, communal, social and cultural matters of common interest.¹⁷ In parallel, ambitious development projections and the rise of consumerism required crisis management adjustment, including economic reforms, such as the major one conceived in 1965, that provided for changes in the housing sector by introducing some free-market principles into what was effectively a socialist market economy in combination with the self-management practices already in place.¹⁸ Under new legal provisions, the central role in housing construction was now assumed by self-managed associations of construction companies with access to the newly-established system of commercial bank loans. Ensuing from systemic political and economic reform, the Petlovo Brdo estate was premised on the projected market price of apartments per m sq. (including communal and social infrastructure), the self-financing of future residents through bank loans effectuated through the Bureau for Rationalization of Construction as an investor, and the Business Association of Construction Enterprises of Western Serbia as the developer.

Petlovo Brdo was conceived as the first phase of urbanization of the former agricultural peripheral villages Kneževac and Kijevo, in response to the rise in number of residents from 3.020 in 1951 to 6.005 by 1961, as well as an increase in the number of households from 955 to 2.282.¹⁹ Demographic trends altered the professional structure from the predominantly agricultural towards the increasingly industrial and, to a lower degree, the population of administration workers. The rural settlements of Kneževac and Kijevo gradually changed into peri-urban conglomerations characterized by illegal or informal spontaneous development of houses with no provision of hygienic, waste, water and sewer infrastructures, largely non-regulated traffic, the persistence of agricultural production without adequate sanitary provision, and generally poor communal facilities and services. On the other hand, vicinity of traffic infrastructure – the Belgrade city ring road, the regional highway connecting to Western Serbia and Montenegro, and the Belgrade-Niš railway – gave the area a potential for growth and connectivity.

In 1962, the Regulation plan of Kneževac-Kijevo envisioned a further development of the industrial zone and the residential development with the associated services, with a preference for single-family houses on separate parcels of an area of ca. 500 m sq.²⁰ The territory was divided into two housing communities of ca. 6.000 residents each, with projected gross density of ca. 60 residents/ha in the concentrated settlement, i.e., 15 residents/ha across the community territory. Foreseeing problems of haphazard and incomplete urbanisation, as individual house owners had no obligation to pay for the communal infrastructure and services, the municipality ordered a study from the Institute for the Rationalization of Construction. Eventually, the study found the planned residential densities to be economically irrational and advised re-planning. Following the housing reform provisions, the new plan was based on the projected market price of apartments that would include the costs of communal infrastructure as well as the construction costs of the



apartment type typ bytu	living room m sq. obývacia izba m ²	dining room m sq. jedáleň m ²	parent's bedroom m sq. rodičovská izba m ²	children's bedroom m sq. detská izba m ²	kitchen m sq. kuchyňa m ²	bathroom m sq. kúpeľňa m ²	wardrobe m sq. šatňa m ²	vestibule m sq. vestibul m ²	corridor m sq. chodba m ²	nett surface area m sq. čistá úžitková plocha m ²
A1	17.77	8.79	15.25	7.03	5.90	3.30	7.86	3.60	3.00	72.50
A2	17.96	6.42	15.04	11.20	5.90	3.30	8.45	3.29	–	71.50
A3	17.96	6.42	15.12	–	5.90	3.30	8.00	3.29	–	59.99
A4	–	15.41*	22.56	–	5.59	3.30	7.93	1.70	–	56.49
A5	–	12.60*	15.10	15.10	5.90	3.30	7.86	1.70	–	61.56
A6	–	10.06*	15.12	–	5.39	3.28	6.63	1.43	–	41.91
A7	–	12.03*	14.00	–	5.39	3.28	6.29	1.43	–	42.42

* extra bed

* postel' navyše

STRUCTURE AND SIZES OF ROOMS IN LOW-RISE HOUSING APARTMENTS

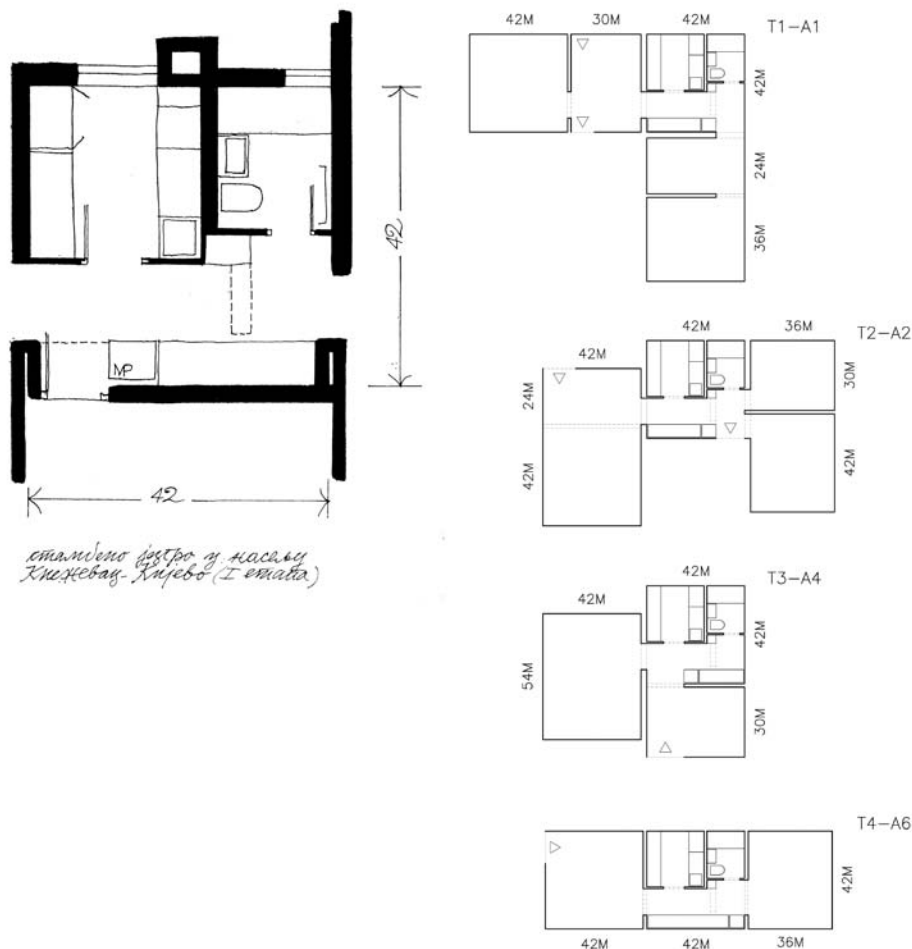
ŠTRUKTÚRA A ROZMERY IZIEB
V BYTOCH V NÍZKOPODLAŽNEJ
ZÁSTAVBE

**RESIDENTIAL CORE PLAN, LEFT –
DRAWING BY B. MILENKOVIĆ;
RIGHT – COMPARISON OF
LAYOUT SCHEMES IN DIFFERENT
APARTMENT TYPES**

PLÁNY OBYTNÉHO JADRA, VĽAVO –
KRESBA BRANISLAV MILENKOVIĆ;
VPRAVO – POROVNANIE SCHÉM
ROZVRHU RÔZNYCH TYPOV BYTOV

Source Zdroj: left vľavo— MILENKOVIĆ,
Naselje Kneževac–Kijevo, p. 27t;

Drawing Kresba: right vpravo—
by Petar Cigić, Ljiljana Blagojević



associated buildings housing social services. The drafting of the first phase, i.e., the Petlovo Brdo Plan in 1967, by Lukić and Potonjak, in collaboration with the architect couple Milenković, occurred in sync with their concurrent architectural designs of house types and grouping patterns.

In order to keep the price affordable for lower income residents, both the planning and design of Petlovo Brdo were premised on maximizing density and minimizing construction cost. A commentary of the time emphasizes the design's rationality: 'Positive is also the idea of typifying and the planned realization of the building of family dwellings, by which it is conveyed to the operative side of building activity and also, possibly, to industrial production, subordinating it at the same time to the rhythm and to the discipline of town planning and architectural conception'.²¹ As a result, the estate, comprising a variety of affordable apartments in diverse urban configurations, achieved net densities of 169 – 175 residents/ha, with 55 – 65 m sq. per resident of green belt respectively, or 105 – 115 residents/ha gross density in low-rise single family housing, and a net density of 181 residents/ha, with 50 m sq. of green belt per resident or gross density of 147 residents/ha in mid-rise, four-story apartment blocks in the perimeter areas.²²

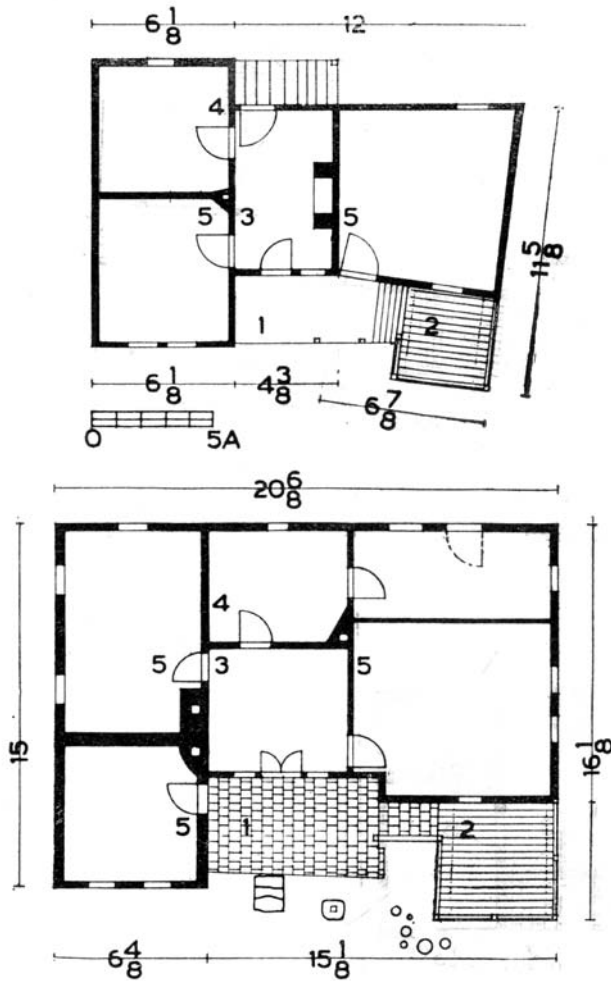
Research and Design

Issues of rationality notwithstanding, the sources of the socio-spatial quality of Petlovo Brdo, we would propose, originate in wider professional and academic discourse of the period revolving around the relation of architectural research and design or, more precisely, contemporary design theory. The theoretical pursuits aimed at design methodology that, as in the case of Petlovo Brdo, would be useful in determining urban and architectural scales and in unlocking the disciplinary

EXAMPLES OF THE BALKAN VERNACULAR URBAN HOUSES IN JAGODINA

PRÍKLAD BALKÁNSKEHO ĽUDOVÉHO
MESTSKÉHO DOMU V JAGODINE

Drawings Kresby: extrapolated by authors
from: MILENKOVIĆ, Branislav: O nekim
konstruktivnim elementima gradske kuće
u Svetozarevu. Glasnik Etnografskog
instituta Srpske akademije nauka, II-III,
1953 – 1954, pp. 766 – 767



boundaries towards a comprehension of social practices, in particular, the everyday life of the settlement's residents. Branislav Milenković argued that the theoretical issue at stake was the very relation of programmatic principles of architecture to Henri Lefebvre's thesis of the 'science of space', that is, of (social) space socially produced.²³ It can be argued that Petlovo Brdo architecturally embodies this very theoretical point and, by means of typological and programmatic invention, situates the discipline of architecture relative to everyday social production of space in socialism.

Since his graduation at the Faculty of Architecture in Belgrade in 1951, Milenković was engaged in the research of housing design and construction, the organization of functional groups in contemporary apartments, and specific economic, sociological, hygienic and architectural aspects of design for different social groups of residents. He participated in many research expeditions exploring vernacular rural and urban heritage in Central and Southern Serbia, Kosovo and the northern parts of Macedonia. In the decade preceding the planning of Petlovo Brdo, Milenković took part in a number of research projects carried out in various institutional frameworks in the Republic of Serbia, such as: 'The design of small residential buildings', at the Institute of Economy, 1954 – 1957; 'The research of vernacular heritage', at the Federal Institute for the Protection of Cultural Monuments, the Institute for the Protection of Cultural Monuments of the Autonomous Region of Kosovo and Metohija and the Ethnographic Institute of the Serbian Academy of Sciences, 1954 – 1964; 'Problems of rural settlements', at the Institute of Hygiene, 1959; 'Contemporary dwelling in rural areas', at the Institute of Household Improvement, 1959 – 1960; 'Methodology of modular coordination in design', at the Board for Modular Coordination and the Centre for the Improvement of Construction – Federal Construction Chamber, 1959 – 1961; and 'A study of the minimum standard dwelling', at the Institute for Architecture and Urbanism, 1965 – 1968. Meanwhile, Elsa Milenković was employed

**PETLOVO BRDO, DETAIL OF ROOF
OVERHANG (HOUSE T1)**

PETLOVO BRDO, USPORIADANIE
STRECHY (DOM T1)

Photo Foto: courtesy of
Branislav Milenković



**PETLOVO BRDO, FAÇADE DETAIL
OF GATE (HOUSE T3)**

PETLOVO BRDO, BRÁNA, DETAIL
FASÁDY (DOM T3)

Photo Foto: courtesy of
Branislav Milenković



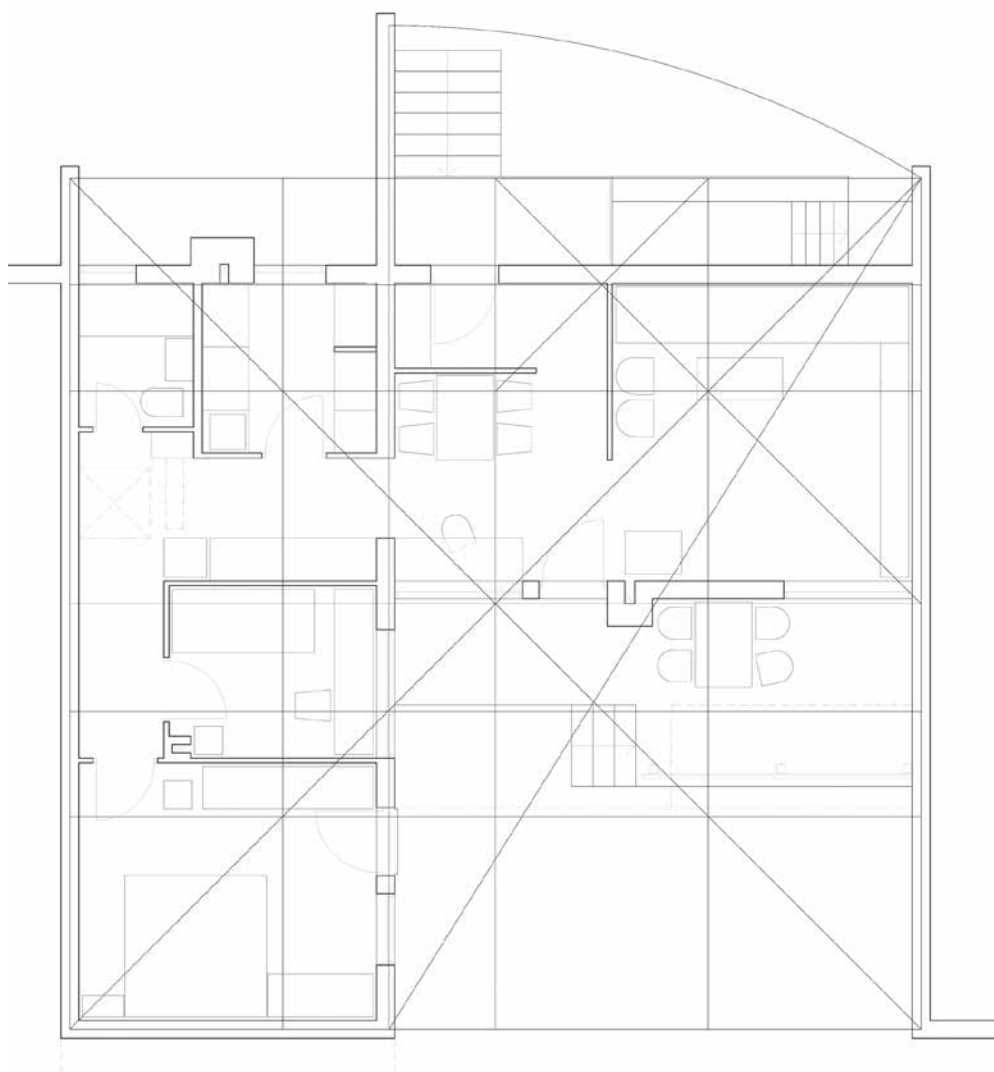
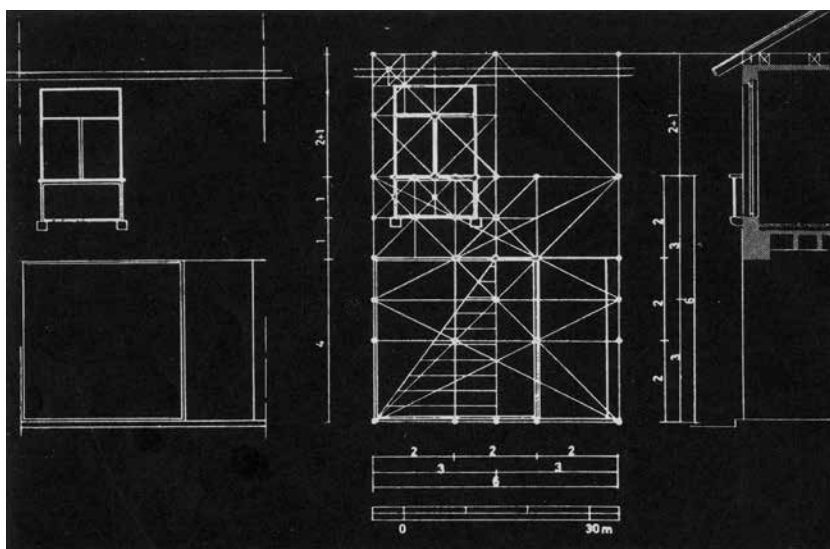
**PETLOVO BRDO, DETAIL OF THE
PORCH (HOUSE T1)**

PETLOVO BRDO, DETAIL VERANDY
(DOM T1)

Photo Foto: courtesy of Branislav
Milenković

in professional design offices where she carried out a large number of architectural projects and realized several buildings and complexes as principal architect. Both their experiences combined to provide a broad knowledge base that was put to practice in the design of Petlovo Brdo.

The structure of the apartments in Petlovo Brdo ranges from one- to three-room units. All apartments are functionally organised within constraints of only two structural spans (3.6 m and 4.2 m). The schemes revolve around two points of gathering: the porch and the dining room, and the so-called 'residential core', comprised of the kitchen, bathroom and household utility area. In all types, the dining room directly links to the entrance and the residential core and, in larger units, to the living room or children's bedroom, while the core provides for an indirect connection between the dining room and the bedrooms; the porch connects either with the residential core or the dining room and in larger types enables the visual correlation between the different zones of the apartment. "Such schematic – elastic in respect to different patterns of use, adaptable to variable geometries and topologies of the site, and generative of different housing typologies and urban mor-



COMPARISON OF A THEORETICAL
DIAGRAM OF A TERRACED HOUSE
FAÇADE BY B. MILENKOVIĆ AND
REGULATING LINES OF A PLAN OF
A TERRACED HOUSE IN PETLOVO
BRDO (HOUSE T1)

POROVNANIE TEORETICKÉHO
DIAGRAMU FASÁDY TERASOVÉHO
DOMU OD BRANISLAVA
MILENKOVIČA A REGULAČNÝCH
LÍNIÍ PROJEKTU TERASOVÉHO
DOMU V PETLOVOM BRDE (DOM T1)

Source Zdroj: MILENKOVIĆ, Branislav: Kvadrat kao element kompozicije. Pregled arhitekture, 4 – 5, 1955 – 1956, p. 133; **Drawing** Kresba: Petar Cigić, Ljiljana Blagojević

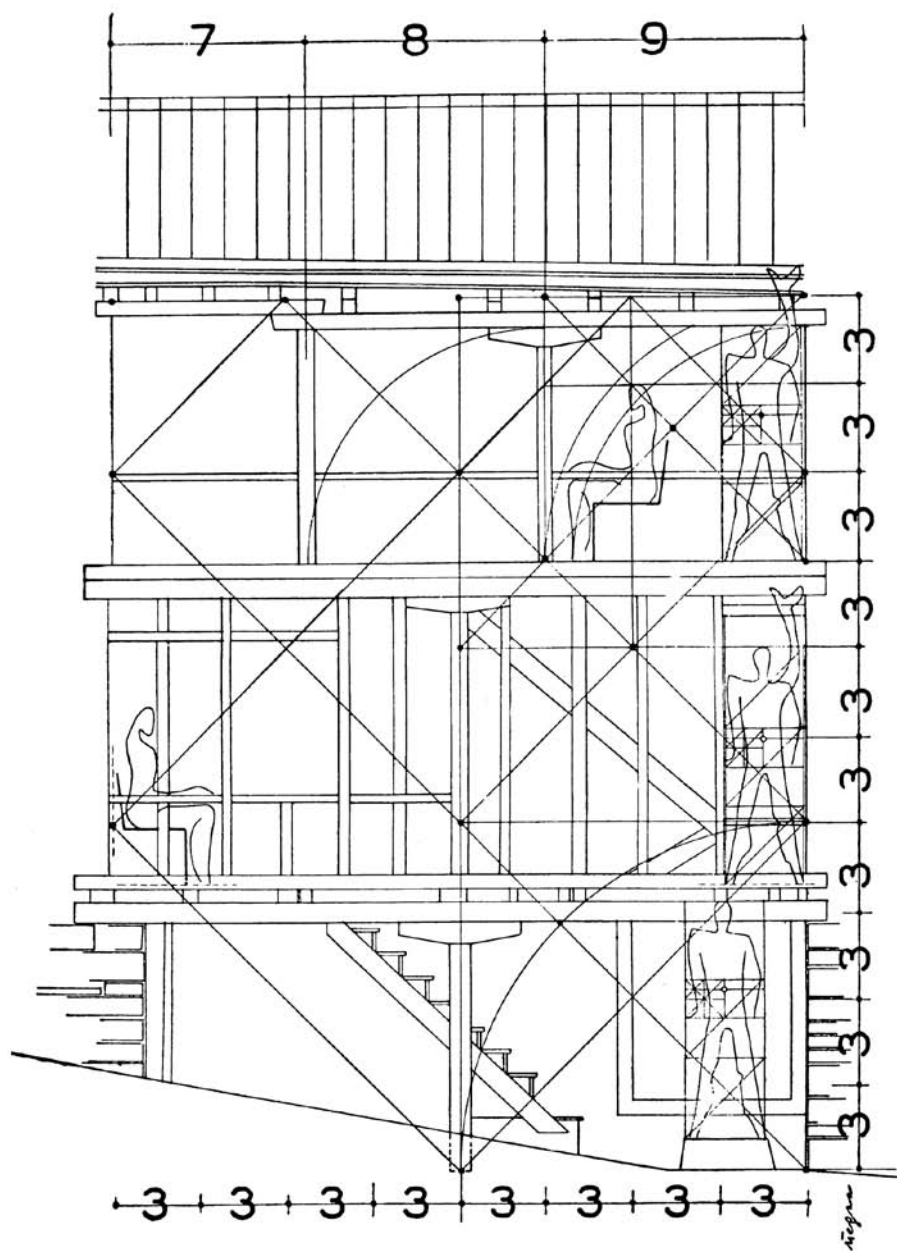
phology diversity – results from the patient research of domesticity carried out by the architects in the decade preceding the design.”

As he had done from the 1950s onward, Branislav Milenković focused on studying an organizational congruence in the motif of the hearth/room containing the stove or oven, *odžaklija* (*ocak*, Turkish), which he had surveyed in twelve nineteenth-century Balkan vernacular urban houses in Jagodina in Central Serbia. He pointed that *odžaklija*, the ‘stove room’, invariably tends towards a regular orthogonal shape and, more importantly, that its spatial role corresponds to the architectural principle of *gathering*.²⁴ This very principle was deemed central to further study of the residential units that Branislav and Elsa Milenković undertook in the course of their design and research. In doing so, they continued and expanded the work of Mate Baylon (1903, Kaštel Kambelovac – 1995, Belgrade), architect and professor at the Faculty of Architecture in Belgrade, who mentored both their diploma projects, and with whom Branislav started to work first as a teaching assistant, then later on as docent, doctorand and colleague professor. In their housing research, both Baylon and B. and E. Milenković searched for an added social spatial value, that is, a family gathering area in contemporary so-called minimum standard apartments that would be analogue to central hearth/stove room in traditional vernacular houses.

In 1957, at the Seminar on Household Economics in Belgrade and, again in 1958, at the Second International Exhibition ‘Family and Household’ held at the Zagreb Fair, Baylon argued for the introduction of what he called ‘expanded communication’ as an organizational principle of forming a family gathering area in minimal standard flats.²⁵ In collaboration with Milenković and two other faculty colleagues, Baylon presented in the Zagreb exhibition two apartment prototypes organized around the entry as the expanded communication area containing a dining table and leading to a balcony. Milenković continued testing this type of organizational scheme in his transdisciplinary research on dwellings for minimum existence, carried out by the Institute for Architecture and Urbanism of Serbia (IAUS) in 1965 on the request of the Republic Fund for Housing Construction – Secretariat for Industry of the Socialist Republic of Serbia. The ultimate goal of that research project was to produce guidelines for housing policy based on an objective insight into the economical, sociological, demographic, hygienic, as well as functional and aesthetic properties of apartments for the low income and deprived urban population, as the architect Milorad Macura, the director of IAUS, observed during one of the preparatory meetings of the study group.²⁶ The design scheme proposed by Milenković in the framework of this research project continued the theme of expanded communication by focusing on the ‘family table’ in the organizing centre of an apartment, that is the place, as the author himself observed, where the hearth/stove is found in vernacular houses.²⁷

Particular care in housing design and research affected contemporary households in terms of the incorporation of technical equipment and appliances in everyday life and, especially, kitchen design and spatial norms. In 1959 – 1961, the Centre for the Improvement of Construction at the Federal Construction Chamber of Yugoslavia, gathered a research team led by Mate Baylon and including Milenković, among others, to act as the Board for the Standardization of Equipment and the Kitchen.²⁸ Issues of household research, we argue, eventually led to the design of the residential core in Petlovo Brdo apartments as a functional space adjustable to different economic standards of residents and the changing technology of household appliances. In addition to efficiency and compactness, Milenković studied the climatic comfort of a number of particular household activities as an added apartment use-value, and consequently incorporated his design solutions in the apartments of Petlovo Brdo, such as airing for cupboards and cross-ventilation openings, the precise positioning of a single heating appliance per apartment regarding minimum energy consumption requirements and for maximum thermal effect, rainwater channelling to garden areas, and the like. In that respect, valuable lessons were learned from vernacular architecture.

Systematic research of rural houses and settlements followed after the constitution of the Federal Institute for the Protection of Cultural Monuments in 1953. In the case of rural houses, due to their great number, territorial dispersal, temporary character and physical transformations over time, research case studies focused primarily on typology and the methodology of vernacular design and construction. One of the first long term research projects, with expeditions organised for the survey, documentation and analysis of vernacular houses, began in 1954 under the supervision of the architect Branislav Kojić (b. 1899, Smederevo – d. 1987, Belgrade), professor at the Faculty of Architecture in Belgrade.²⁹ Milenković had participated in this project, regularly spending the summers between 1954 and 1964 on field-study travels to the largely non-industrialised south of



**ANALYSIS OF THE FAÇADE OF
A HOUSE IN OHRID, DRAWING BY
BRANISLAV MILENKOVIĆ**

ROZBOR FASÁDY DOMU NA
OCHRIDE, KRESBA BRANISLAV
MILENKOVIĆ

Source Zdroj: MILENKOVIĆ, Branislav:
Primeri iz antropomorfne analize zgrada
za stanovanje u Makedoniji. Zbornik
Arhitektonskog fakulteta u Beogradu,
1953 – 1956, p. 168

Yugoslavia. The sources gathered during the expeditions became the basis of several articles in which Milenković implicitly links vernacular and contemporary design methodology. As elements lacking in post-war housing, he singles out porches and terraces that serve as physical mediators between the living areas inside the house and the outdoor space. Apart from providing optimal climatic and dimensional areas for a number of everyday activities of leisure, these elements are noted for the spatial quality of zones with differentiations in levels of privacy and exposure, enclosure and openness, artificiality and naturalness. Milenković argued in his articles that the relations between 'surfaces interacting in space' such as terraces, porches, verandas, porticos, loggias and the like, were mediated by dimensional modularity rooted in measures and proportions of the human body.³⁰ He pointed out that half-timbered vernacular houses in various regions of the Balkans were constructed using anthropometric measures as a basic module of the square shape and its simple geometrical division. In this way, houses are modularly coordinated, which effectively rationalized the process of their construction. Moreover, due to the anthropomorphic character of the basic module, the assembly of coordinated elements resulted in indoor spaces precisely dimensioned to

accommodate complex everyday activities. Not only were the houses intimately tied to the human body but, in certain cases, the interconnectedness of scale and proportions resulted in changing compositional situations and dynamic environment. As our analysis shows, Milenković used the potential of the *ad quadratum* geometry in the composition of Petlovo Brdo.

In addition to studying vernacular architecture from the point of view of its logic and rationality of construction, the rising demands for industrialisation of construction led to the research of modularity and modular coordination in architecture. The leading figure in this field was the architect Milan Zloković (b. 1898, Trieste – d. 1965, Belgrade), professor at University of Belgrade Faculty of Architecture, who greatly inspired his student and subsequent colleague Branislav Milenković.³¹ The methodology of design employed in Petlovo Brdo, in fact, can be considered as succeeding the particular *modus operandi* that Zloković had instigated in his design and research beginning in the 1930s.³² Advocating Zloković's theory and finding the modular coordination of vernacular architecture to contain methodological complexity, Milenković criticized the technocratic proposal of one meter (ten construction modules of ten centimetres), as a base design module. In 1958, he submitted his *habilitation* thesis (for the title of docent) at the University of Belgrade entitled 'The Design Module – One of the Significant Elements of Design', that included chapters on subject matters ranging from vernacular urban and rural houses and proportions of the square as an element of architectural composition, to an analysis of basic and common dimensions in housing, based on the standard module $1\text{ M} = 10\text{ cm}$, as well as a practical application of the design module $1\text{ M}' = 6\text{ M} = 60\text{ cm}$.³³ His argument is supported by a modular analysis of typical functional units in contemporary apartments determined by the size of objects that any particular activity necessitates, and by the characteristic positions of human body it implies.

The room areas in apartments in Petlovo Brdo directly relate to his analysis of modularity, as follows (W – width / D – depth / achieved area):

living room	W 42 M [7 M'] / D 42 M [7 M'] – 17.64 m sq.
dining-room	W 24 M [4 M'] / D 24 M [4 M'] – 6.00 – 9.00 m sq. (inc. extra bed)
kitchen	W 24 M [4 M'] / D 24 M – 30 M [4 – 5 M'] – 5.76 m sq.
single bedroom	W 21 M minimum [3+1/2 M' or 3 and 1/2 M'] / D variable – 13.30 – 15.12 m sq.
double bedroom	W 36 M [6 M'] / D 42 M (2 x 21 M) [7 M'] – 15.12 m sq.
bathroom with shower	W 14 M [2+1/3] / D 30 M [5 M']
with bath	W 18 M [3 M'] / D 27 M [4+1/2] – 3.35 m sq.
WC	W 9 M [1+1/2] / D 12 M (door in) – 14 M (door out) [2 – 2+1/3]

To summarize, in Petlovo Brdo, the design methodology of a modular coordination combined with the conception of the apartments' use-value as a function of layout disposition, along with the climatic and aesthetic qualities of the domestic and urban environment. The housing units were precisely organized and dimensioned in sync with the design of urban blocks and the sizing of individual plots, resulting in a high residential density for this type of settlement, and a physical structure flexible enough to adjust to the existing traffic network. The design process was further refined through direct contact with the prospective residents who had the opportunity to participate in the final phases of design and construction. Specifically, after choosing an apartment on the basis of the site plan and the initial catalogue of housing-types, the buyers had the option to introduce changes in the design to suit their particular needs with the full collaboration of the architects, who provided custom design amendments free of charge during the two years of the estate's construction phase. In a recent conversation with the authors, Branislav Milenković recalled that the changes were primarily concerned with extending the living area to the attic, the provision of auxiliary spaces in the basement or the fine-tuning of functional organization according to the particular family-structure. This points to the conclusion that such an extent of user-participation in Petlovo Brdo came about primarily to the architectural properties of the design itself and, more importantly, a profound understanding of the discipline of architecture relative to other social practices in the domain of housing.

In his doctoral thesis, Branislav Milenković created a draft of the structure of methodology of architectural research that proposes the programmatic principles of architecture as the sum of experiences in an engagement with the production of space, in particular, the experiences of everyday life of inhabitants of a given architectural and urban space. Emerging from the interaction between multidisciplinary investigations and architectural research of design solutions to 'conditions of



**THE GROUP FORM OF THE PETLOVO
BRDO SUB-BLOCKS**

PETLOVO BRDO SKUPINOVÁ FORMA
ČIASTKOVÉHO BLOKU

Photo Foto: courtesy of Branislav
Milenković





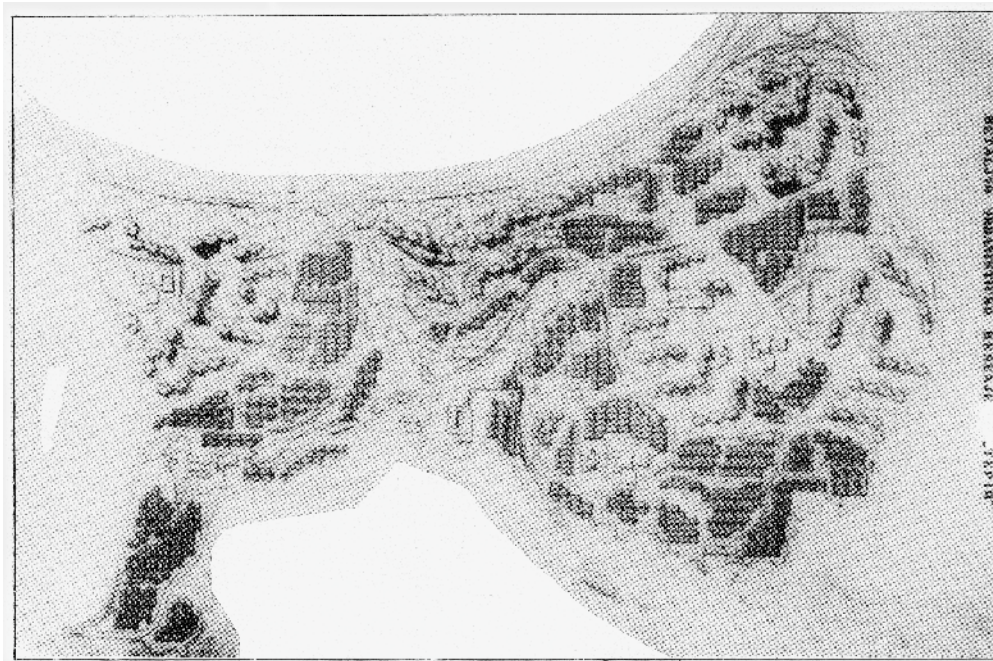
PETLOVO BRDO TODAY

PETLOVO BRDO V SÚČASNOSTI

Photo Foto: Ljiljana Blagojević, Petar Cigić, 2016



physical and social existence of humans', the study of programmatic principles of architecture, Milenković argued, was to provide the 'answers to vital questions of organization and design of physical structures', with an orientation towards their future development.³⁴ This future concerned the appearance of novel 'spatial units and assemblages' or 'spatial levels', whose physiognomy 'does not have to be in line with our present understanding of the city, the village, small settlements, and so on', but is determined by 'changes in life's rhythms and needs'.³⁵ Milenković's proposition of a 'two-way line of influence' between physical structure and the everyday,³⁶ leads us to understand his thesis on the discipline of architecture, that is to say, that the architecture itself contributes to social practice by way of finding physical structures and organizations attuned to novel elements in spatial practice.



SITE PLAN OF KNEŽEVAC-KIJEVO, PHASES II AND III. COMPETITION ENTRY BY VLADIMIR BJELIKOV, SMILJA KANAČKI, BRANISLAV MILENKOVIĆ AND JELISAVETA MILENKOVIĆ; III PRIZE

SITUAČNÝ PLÁN KNEŽEVAC-KIJEVO, FÁZA II. A III., SÚŤAŽNÝ NÁVRH OD VLADIMÍRA BIJEKOVÁ, SMILJE KANAČKI, BRANISLAVA MILENKOVIČA A JELISAVETY MILENKOVIČ; III. CENA

Source Zdroj: Prikaz konkursnih projekata 1965 – 1975, Arhitektura urbanizam, 1975, 74 – 77, p. 73

Concluding note

In conclusion, we would suggest that in the socialist residential landscape of 1960s Serbia, torn between individually driven informal development of peri-urban conglomerations and societally planned satellites of mass housing, the outcome of design theory put to practice in Petlovo Brdo struck a singular socio-spatial balance between the individual and the communal. In the estate, the original combination of apartments into a variety of house-types and groupings of houses in different community/neighbourhood formations blurred the isomorphic relationship between social and the physical space. In that way, the privacy of an individual unit correlates to a collective or rather communal spatial organization of the sub-block, neighbourhood block and settlement as a whole. One striking feature of the estate when visited today is that, despite the effective, if not legal, total privatising of the common open space around the houses in the form of fenced gardens,

1 BLAGOJEVIĆ, Ljiljana: The Residence as a Decisive Factor: Modern Housing in the Central Zone of New Belgrade. *Arhitektúra & urbanizmus* 46, 2012, 3 – 4, pp. 228 – 249.

2 Cf. 'key dimensions of practicing architecture and building Socialism were intertwined, and even commensurate at times, through the framework of Socialist lifestyle', manuscript (p. 18) of MILJAKČKI, Ana: The Optimum Imperative: Czech Architecture for the Socialist Lifestyle, 1938 – 1968. London, Routledge, forthcoming in 2017.

3 The 'problem' posed by LE CORBUSIER: Toward an Architecture. Translated by John Goodman. The Getty Research Institute, 2007, p. 162.

4 Jelisaveta Milenković (b. Elsa Mayer, 1929, Belgrade – d. 2012, Belgrade), and prof. dr. Branislav Milenković (b. 1926, Belgrade), wife and husband, worked on joint co-authored projects as priva-

te architects in their home based, sole practitioner design practice.

5 LUKIĆ, Jovan: Transformacija u urbanističkom planiranju i izgradnji naselja Kneževac-Kijevo. *Arhitektura urbanizam*, 1971, 66, p. 37.

6 CURTIS, William J. R.: *Modern Architecture Since 1900*. London, Phaidon Press Ltd 2012 (736 p.), p. 466.

7 BAYLON, Mate: Stambena izgradnja Švedske. Beograd: Stalna konferencija gradova Jugoslavije 1958. 64 p.; ALEK-SIĆ, Branko: *Arhitektura i stanovanje u Danskoj*. Beograd, Univerzitet u Beogradu – Arhitektonski fakultet 1981. 118 p.

8 MILENKOVIĆ, Branislav: Studija programskih načela arhitekture i njen odnos prema drugim poljima u nauci o prostoru. Beograd, Univerzitet u Beogradu – Arhitektonski fakultet, 1980, pp. 57 – 58.

9 France Ivanšek (b. 1922, Ljubljana – d. 2007, Ljubljana) and Marta Ivanšek (b. Ravnikar, 1920 – d. 2009), husband and wife. KOSELJ, Nataša: Ob smrti Franceta Ivanška. *AB: Arhitektov bilten*, 37-173/174, 2007, pp. 112 – 115; MALEŠIĆ, Martina: Ob slovesu od arhitekta Marte Ivanšek. Available at <http://trajekt.org/arhiv/?tid=10&id=1093>. Accessed 1st August 2016.

10 IVANIŠEK, France: Eno družinska hiša: Od prostostoječe hiše k nizki zgošćeni zazidavi. Ljubljana, Ambient 1988, p. 11.

11 BJELIKOV, Vladimir: Summary, translated by M. Isailović. *Arhitektura urbanizam*, 1969, 55, pp. 63 – 64.

12 Ibid., p. 64. See: Stambeno naselje Murgle Ljubljana. *Arhitektura urbanizam*, 1969, 55, pp. 22 – 25.

13 Construction phases: 1st 1965 – 1969; 2nd 1968 – 1978; 3rd 1976 – 1982; and 4th 1980 – 2009. MALEŠIĆ,

Martina: Murgle Settlement. Eds. Maroje Mrduljaš – Vladimir Kulić. *Unfinished Modernizations – Between Utopia and Pragmatism*. Zagreb, Croatian Architects' Association, 2012, pp. 336 – 347.

14 In addition to low-rise typology, there are three additional types of mid-rise buildings (G + 3 floors), that also have one additional apartment type. The analysis of mid-rise typology is beyond the scope of this article.

15 MILENKOVIĆ, Branislav: Razgovor o običnom, vodio Miloš Bobić. *Komunikacija*, 49, 1986, not paginated. Unless otherwise noted, all translations from Serbian to English are by the authors.

16 VUJNOVIĆ, Ratko: Prognoze i tendencije u stambenoj izgradnji u narednom desetogodišnjem periodu. *Arhitektura urbanizam*, 1975, 74 – 77, pp. 9 – 10.

PETAR CIGIĆ, M. ARCH.,
PhD CANDIDATE
UNIVERSITY OF BELGRADE
FACULTY OF ARCHITECTURE

Bulevar kralja Aleksandra, 73
Belgrade 11000
Serbia
cigicm@gmail.com

Dr. LJILJANA BLAGOJEVIĆ,
Dipl. Eng. Arch., M.Sc. Arch.
UNIVERSITY OF DONJA GORICA
UDG POLYTECHNICS
Podgorica 81000
Montenegro
liljblagojevic@gmail.com

the commonly planned planting of conifers throughout the estate – pines, firs, spruces, sequoias, cedars and other such trees that have been growing for nearly 50 years now – have formed into a magnificent canopy above the low-rise housing, testifying to the intrinsic concept of unitary wholeness.

As a final point, we would ask why was the Petlovo Brdo model abandoned? In 1971, the estate's original urbanist Jovan Lukić wrote that the reasons lay in insufficient and incomplete economic analysis of the projected costs, and concluded that the estate has proven low residential density 'illusory' as a concept of affordable — or, as he in fact writes — 'cheap' housing.³⁷ Branislav and Elsa Milenković had a divergent view and offered alternative routes to re-thinking the issue of density. In their competition entry for the planning and construction of the subsequent phases of Kneževac-Kijevo, carried out in collaboration with their colleagues and friends, the urbanist couple Vladimir Bjelikov and Smilja Kanački (b. 1923, Vršac – d. 1997, Belgrade),³⁸ they opted for a more complex level of mediating the individual and the collective by way of a dense mat-typology of cascading atrium houses.³⁹ The scheme was rejected, followed by the complete abandonment of the model of low-rise high-density housing for some twenty-odd years. While informal settlements of extra-legal individual houses proliferated across the country, the architectural profession largely turned a blind eye to the low-rise housing model well until the time of socio-political and economic changes leading to the fall of socialism and the related re-consideration of architectural and urban discourse that originated through the critical stimulus of post-modernism.⁴⁰ Pushed into the periphery as a school of architectural thought, the Petlovo Brdo estate was transformative as a school of post-socialist life through everyday socio-spatial practices, flowing from the urban periphery of the 1960s into the contemporary folklore of today.

17 KONSTANTINOVIĆ, Svetolik: Razvoj stambene politike i modeli ostvarivanja stambene izgradnje. Beograd, Kultura, 1993, p. 92. Cf. BLAGOJEVIĆ, Ljiljana: Architectural Intelligence and Scarcity Driven Design in 1960s Yugoslavia. pp. 199 – 213. In: Moravánszky, Ákos – Kegler, Karl (eds.) Re-Scaling the Environment: New Landscapes of Design, 1960 – 1980. Volume 2 of East West Central: Re-building Europe, 1950 – 1990. Volumes 1 – 3. Basel, Birkhäuser 2017.

18 On 'market socialism', see: HORVAT, Branko: The Political Economy of Socialism: A Marxist Social Theory. London, Routledge, 1983. 660 p.

19 Regulation Plan of the Settlements Kneževac and Kijevo. Draft. Belgrade, Office for Urban Planning of Belgrade 1962, pp. 2 – 3.

20 LUKIĆ, Jovan: 1971, p. 37.

21 BJELIKOV, Vladimir: Summary, p. 64.

22 MILENKOVIĆ, Branislav: Naselje Kneževac-Kijevo. Arhitektura urbanizam, 1969, 55, pp. 26 – 30.

23 MILENKOVIĆ, Branislav: Studija programskih načela arhitekture, pp. 9 – 12. Cf. LEFEBVRE, Henri: The Production of Space. Translated by Donald Nicholson-Smith. Malden, MA, Blackwell Publishing, 2004. 454 p.

24 MILENKOVIĆ, Branislav: O nekim konstruktivnim elementima gradske kuće u Svetozarevu. Glasnik Etnografskog instituta Srpske akademije nauka, II-III, 1953 – 54, pp. 763 – 781.

(Cyrillic). MILENKOVIĆ, Branislav: Građevinska tradicija I. Zbornik Arhitektonskog fakulteta, 8, 1967, pp. 40 – 43.

25 BAJLON, Mate: Stan za naše prilike. In: Stanovanje: Narodna Republika Srbija: Druga međunarodna revijalna izložba "Porodica i domaćinstvo". Zagreb, 1958, pp. 11 – 13.

26 Minutes of IAUS Subcommittee for Housing, 14th May, 1965. Archive of the Institute of Architecture and Urbanism of Serbia.

27 MILENKOVIĆ, Branislav: Anketni materijal: Prikazi stana minimalnog standarda. Manuscript, 1965. Archive of the IAUS.

28 BAJLON, Mate – TANCIG, Branka – BARTOLIĆ, Ivo – MILENKOVIĆ, Branislav – BRAVAČIĆ, Stevan – VUKOV, Jovan – GATALOVIĆ, Vojislav: Principi za projektovanje i dimenzionalni standardi za izradu uređaja, opreme i nameštaja kuhinje. DGA: Dokumentacija za građevinarstvo i arhitekturu, 17, 1960, pp. 1 – 35.

29 KOJIĆ, Branislav: Metodika rada na istraživanju spomenika profane arhitekture. Zbornik zaštite spomenika kulture, VI – VII, 1955 – 56, p. 103 (Cyrillic).

30 MILENKOVIĆ, Branislav: O nekim konstruktivnim elementima gradske kuće u Svetozarevu; MILENKOVIĆ, Branislav: Kvadrat kao element kompozicije. Pregled arhitekture, 4 – 5, 1955 – 56, pp. 128 – 134. (Cyrillic)

31 Letter by Branislav Milenković to Ljiljana Blagojević, dated 22nd January 2016.

32 ZLOKOVIĆ, Milan: La coordinazione modulare. In: AA. VV. Industrializzazione dell'edilizia. Bari, Dedalo, 1965, pp. 139–196. Cf. BLAGOJEVIĆ, Ljiljana: Modernism in Serbia: The Elusive Margins of Belgrade Architecture, 1919 – 1941. Cambridge, Mass., MIT Press, 2003, pp. 190 – 225. BLAGOJEVIĆ, Ljiljana – MILINKOVIĆ, Marija: The beauty of production: module and its social significance. arq: Architectural Research Quarterly, 17/3 – 4, 2013, pp. 253 – 268.

33 MILENKOVIĆ, Branislav: Projektantski modul – jedan od bitnih elemenata projektovanja. Unpublished Habilitation Thesis, University of Belgrade Faculty of Architecture, 1958, not paginated.

34 MILENKOVIĆ, Branislav: Studija programskih načela arhitekture ..., p. 110.

35 Ibid, pp. 47 – 48.

36 Ibid, p. 36.

37 LUKIĆ, Jovan: 1971, p. 37.

38 For biographical details of Serbian architects, see MANEVIĆ, Zoran: Leksikon srpskih arhitekata 19. i 20. veka. Belgrade, Klub arhitekata and Građevinska knjiga, 1999.

39 Konkurs za izradu arhitektonsko-urbanističkog rešenja II i III etape naselja Kijevo-Kneževac u Beogradu. Arhitektura urbanizam, 1971, 66, pp. 38 – 45.

40 For instance, despite his continual efforts to bring forth the subject matter as well as the apparent success and development phases of Murgle settlement, France Ivanšek managed to publish his book on the subject only in 1988, even though his original manuscript dated from 1968. The repressed model eventually returned in the 1980s, but then only in a form of a high standard housing, such as in the houses in the estate Bežanijska Kosa (1984 – 1985, constructed 1985 – 1990), in New Belgrade or Kajfešov Brijeg in Zagreb (designed 1980 – 1981, constructed 1983 – 1987, by architect Ante Marinović Uzelac). Perhaps it should be mentioned that one of the most popular and affordable house types in Bežanijska Kosa, a post-modernist neo-vernacular type nicknamed 'Vojvodanka' after the region Vojvodina, was designed in the 1980s by the architect Ratko Karolić (b. 1946, Martinci), a student collaborator in the design of Petlovo Brdo and, later, close associate and junior faculty colleague of Branislav Milenković.