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# Modernism in Belgrade: Classification of Modernist Housing Buildings 1919-1980

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**Abstract.** Yugoslavian Modernist Architecture, although part of a larger cultural phenomenon, received hardly any international attention, since there are only a few internationally published studies about it. Nevertheless, Modernist Architecture of the Inter-war Yugoslavia (Kingdom of Yugoslavia), and specially Modernist Architecture of the Post-war Yugoslavia (Socialist Federal Republic of Yugoslavia under the “reign” of Tito), represents the most important architectural heritage of the 20th century in former Yugoslavian countries. Belgrade, as the capital city of both newly founded Yugoslavia(s), experienced an immediate economic, political and cultural expansion after the both wars, as well as a large population increase. The construction of sufficient and appropriate new housing was a major undertaking in both periods (1919-1940 and 1948-1980), however conceived and realized with deeply diverging views. The transition from villas and modest apartment buildings, as main housing typologies in the Inter-war period, to the mass housing of the Post-war period, was not only a result of the different socio-political context of the two Yugoslavia(s), but also the country’s industrialization, modernization and technological development. Through the classification of Modernist housing buildings in Belgrade, this paper will investigate on relations between the transformations of the main housing typologies executed under different socio-political contexts on the one side, and development of building technologies, construction systems and materials applied on those buildings on the other side. The paper wants to shed light on the Yugoslavian Modernist Architecture in order to increase the international awareness on its architectural and heritage values. The aim is an integrated re-evaluation of the buildings, presentation of their current condition and potentials for future (re)use with a specific focus on building envelopes and construction.

## 1. Introduction

The main aim of the paper is to shed light on the most representative examples of the Modern Movement built in Belgrade from 1919-1980 in order to increase the international awareness of its architectural and heritage values. As one of the rare English-language publications about Belgrade Modernist Architecture, it aims to provide an overview of Belgrade modernist housing, as major undertaking in Belgrade of 20<sup>th</sup> Century. However, the main goal of this research is analysis and re-evaluation of those buildings to identify the need to be preserved, but also to highlight the main issues in contemporary context and potentials for future (re)use.



Modernist Architecture, as part of the 20<sup>th</sup> Century heritage, is under-represented heritage on the World Heritage List, [1]. Being a part of this larger cultural phenomenon, Belgrade Modernist Buildings, in the specific context of post-communist society, are "either literally disintegrating due to disrepair or are being altered, ruined, and transformed beyond recognition" [2]. Those buildings urge the strategies for (re)use in the contemporary context.

Socio-political context of Belgrade was changing during the last century. Within the transformation of the context Modern Movement was changing as well, adapting to the context - to the new state politics, the new social systems, the industrialization and technological development. Turning toward the past and analysing the iterations of Modernist Architecture in different socio-political context of Belgrade will help in defining strategies for their (re)use.

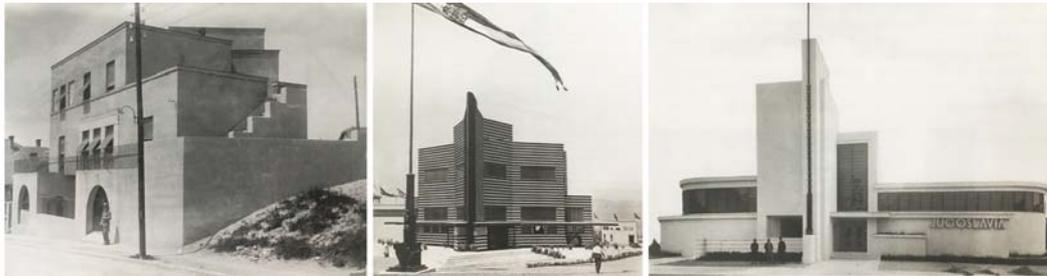
## **2. The Emergence and Development of Modernist Architecture in Belgrade**

The first iteration, or emergence, started in the years after World War I at the same time when the first Yugoslav state emerged - The Kingdom of Serbs, Croats, and Slovenes, under the Serbian Dynasty of Karađorđević [3]. It was necessary to create the new identity for the country. Belgrade, as the capital of the newly founded state, had to transform from "a provincial border city into what was meant to be a modern European capital worthy of the victorious nation" [2]. Demolished after-war Belgrade with ruined around one-third of building supply was faced with an immense population increase at the same time. Those factors caused a huge housing crisis. Since there were no state-running social housing projects, the housing problem relied on the private investment of landlords. The clientele requested from architects to design the buildings similar to Provencal or English houses, in order to illustrate their material status. Therefore, in the first after-war years, the identity of Belgrade architecture was quite heterogeneous - buildings were designed as modest representatives of the secession, academism, the other historical European styles and different national styles. The identity of the new architecture was mainly characterized by historicism and eclecticism.

However, in later 1920s many young intellectuals and artists returned from European centres where they had been educated and brought a new spirit in the traditionalist environment. The Group of Architects of the Modern Movement (GAMM) was formed in 1928 by four young architects - Milan Zloković, Branislav Kojić, Jan Dubovy and Dušan Babić, and their cross-cultural experience was of great importance. Milan Zloković was born in Trieste (part of Austro-Hungarian monarchy at that time) into a family of Serbs, and studied in Graz, Belgrade and Paris. Branislav Kojić was born in Serbia and studied in Paris. Jan Dubovy was from Czechoslovakia, where he also studied. Dušan Babić was a Serb from Banja Luka (also Austro-Hungarian monarchy) and studied in Vienna [2]. The work of the group in the first years was marked by active lectures and exhibitions activities. The group member Branislav Kojić attended The International Congress of Architects in 1928 in Netherlands; other congresses, such as *Neuesbauen* (in German) or the *Congres International d'Architecture Moderne - CIAM* (in French), were held in the same year. Also in 1928 there was an exhibition of Czech Modern Architecture - Czech Functionalism in Belgrade and Zagreb that influenced the development of Belgrade Modernism [4]. Those activities were important in popularization of modern architecture in Belgrade so that other architects started to join the group. One of the most successful architects of the historical styles, Dragiša Brašovan, joined in and by the end of 1930 there were about fifteen members [2]. Despite its success, the group was disbanded in 1934.

One of the group's members, Milan Zloković, designed the first modern house in Belgrade for himself and his family. The Zloković's house was built in 1928, in the same year when the GAMM was found. Therefore, this year can be taken as the year of real emergence of modern architecture in Belgrade. In the next year the Yugoslav pavilion was presented at the International Exposition in Barcelona. Designed by Dragiša Brašovan, the pavilion was the first modern building of the state, and its great success with the international public was even more glorified in Yugoslavia. After the

triumph in Barcelona, the architect joined the GAMM. The success of the pavilion in Barcelona provided the opportunity for the architect to design Yugoslav pavilions for the next two International Exhibitions: Milan in 1931 and Thessalonica in 1932. Until the end of the 1930s great achievements of modernist architecture were built. The Modernist Architecture of the Inter-war period in Belgrade was the basis for the further development of modern architectural thoughts and practice after World War II.



**Figure 1.** Zloković's House, 1928; Yugoslav pavilions, 1929 and 1931;(left to right) [2]

The post-war Yugoslavia (Socialist Federal Republic of Yugoslavia) was re-established by the Communist Party of Yugoslavia, led by Yugoslav Partisans (the largest anti-fascist resistance movement in occupied Europe) and its leader Marshall Josip Broz Tito. The complexity of socio-political context of the second Yugoslavia and its relations with the "East" and "West" is very good explained in the book *Modernism In-between: The Mediatory Architecture of Socialist Yugoslavia*. The Socialist Yugoslavia emerged after World War II as part of Soviet ally. Following the Soviet example, the state immediately centralized the economy. "The construction industry was among the first to be nationalized. By the end of 1947 private architectural practice has also been nationalized, and the architectural profession reorganized into state-owned architectural and urban planning offices." Such extreme centralization did not last long. Only three years later, in 1948 the Comintern expelled Yugoslavia from its ranks. After the break with Soviets, Yugoslavia reformed its socialism as a specific version of "humane", decentralized and democratized socialism [5]. In the mid-1950s Yugoslavia again redefined its political course. After Stalin's death, friendly relations with the communist bloc were re-established, but Yugoslavia was never member again. It then briefly allied with the West, and then, together with the president of Egypt and the prime minister of India, Tito became leader of the Non-Aligned Movement, "which refused to take sides in the Cold War and instead advocated tolerance and peaceful coexistence between the rival systems" [3].

Those big socio-political transformation had very important impact on the architecture. The first post-war goal was to rebuild the devastated country. Yugoslavia was one of the countries that suffered the worst damage in World War II. Enormous number of people were left homeless. Belgrade suffered extensive damage caused by several bombings (German, but also Allied bombing). More than a third of all buildings were ruined [3]. In 1947 the Five-Year Plan (1947-1952) for instant modernization of the country was established influenced by the Soviet model. In the first post-war years, while Yugoslavia was "in the Soviet orbit", the identity of the architecture was influenced by Soviet monumental structures and socialist realism. With Yugoslavia's break with the Eastern bloc, the architecture left the doctrine of socialist realism, although there were some examples of its architecture built in Belgrade. The official end with socio-realism was signed in Dubrovnik in 1950 on the first meeting of architects on the urbanism topic. Re-established Yugoslavia, now with changed ideology, needed once again a new identity that could represent the power of the new state and its break with the past(s). The main difference between the Post-war and the Inter-war modernization of Belgrade was that the main construction field was changed. The new territory appeared - the empty-flat-land on the other side of river Sava, opposite to the old orient and then monarchical Belgrade. The territory was supposed to become the new capital city of Yugoslavia - New Belgrade. In the first post-war years the modern city was planned with the main function of the state administration. Therefore in 1947 the competition for the two large state buildings was announced - the building of the Central Committee

of the Communist Party of Yugoslavia and the Presidency of Government of Federal People's Republic of Yugoslavia. The buildings were supposed to be designed as monumental and representative [6]. The monumentality of the first administrative buildings was influenced by socialist realism in order to represent the power of the new state. Since the buildings were built only a decade later, although monumental, they are examples of high modernist achievements. At the same time, those two buildings were the only realized part of the *concept of the capital city*. The New Belgrade was realized in 1960s and 1970s, but as a *city of housing*. Yugoslavia's "in-betweenness" affected creation of specific Socialist Yugoslavian Modernism. As illustrated in [3]: "Socialist Yugoslavia was a country suspended between traditional cultures, competing concepts of modernization, and rivalling Cold War blocs. It produced a diverse body of architecture that defies easy classification and blurs the lines between the established categories of modernism."

### 3. Transformation of the main Housing Typologies within the Modernization of Belgrade

Although the Inter-war housing architecture was characterized by diversity in styles, the housing typology was quite simplified. The two main housing types existed during the Inter-war period: villas and apartment blocks (figure 2). The privileged class owned the villas, and since there were no state running programs for solving housing crisis, the rental property market grew and the new housing type emerged. The same wealthy citizens invested in rental apartment blocks for middle class population.



**Figure 2.** Inter-war architecture, Momčilo Belobrč. Villa in Kačanskog, 1933; Apartment blocks in Dositejeva, 1937; Francuska, 1937; Svetogorska, 1938; and Bosanska Street, 1940 (left to right) [2]

After the first Modernist house was built in Belgrade, Zloković's House, *the latest style* became appealing for the bourgeois. In the next years series of modernist villas appeared. Nevertheless, buildings of the other housing type, apartment blocks, were the main representatives of modern housing architecture of the Inter-war Belgrade. Considering their commercial character, economical aspects of the buildings were very important for the landlords - invest minimum, gain maximum. Modernist, purist architecture without decorative plastics was especially suitable for their investments. On the other hand, architects were able to express the new aesthetic of purism. Therefore, in 1930s there was an expansion of the apartment blocks. The property investors wanted to follow *the trend*, so at one point the apartment blocks became typified products. Momčilo Belobrč, architect and member of the GAMM, realized a huge number of the apartment blocks in Belgrade in the period from 1932-1940. He designed 28 buildings of this type, as "natural, non-idealized body of residence" [2].

While the first period was characterized by big social differences, and thus the housing relied on private investment of landlords who owned and rented dwellings to lower class population, in the second period of the specific Tito Yugoslavia's socialist democracy, social equality of classless society led to socialist imperative "flat for everyone" that needed to be accomplished.

"Yugoslav modernist architecture welcomed the arrival of socialism as a chance to redress the ills of life in capitalism" [3]. The housing policy changed and the institution of "investors" disappeared. "Right to Residence" was defined in the conclusion of the First Yugoslav Forum on Housing and

Construction in 1956 as basic legal institute enabling to the working man one of the most important conditions of life [7]. The state became the main investor in housing development, and the young people of Yugoslavia "brigadiers" participated in the process of construction of mass high-density housing. In the atmosphere of regeneration of the demolished country, collectivization and socialization, the new housing typologies emerged. "If the iconic modernist villa was a nearly extinct species, the experimentation that used to be associated with it was shifted to the collective scale, in some instance producing unusual results" [3]. The relation between collective and individual in Yugoslavian version of socialism was very specific. It was more collectivized than the West, but also more individualistic than the socialist East.

Within the main construction field - New Belgrade, the new soc-modernist housing concepts and experiments were conducted. The Master plan for New Belgrade past through several iterations, and after the failure of the "capital city" concept, New Belgrade was realized in 1960s and 1970s as a housing city. From its initial urban plan at least were realized the orthogonal grid of the infrastructure and the *block* as main urban unit. The predominant function of the New Belgrade's *blocks* was residential. Residential Blocks were mega housing complexes, and thus composed of different types of residential buildings, such as: single-tract and double-tract buildings, meanders, terraced buildings, stairs-lamellae, high rise buildings (classified by different criteria: volume, structure, organization, shape, etc.). The diversity of the sub-types was large, but they were always organized in the big collective housing unit - the block. Meanwhile in the old part of Belgrade (on the other side of the river Sava) multi-family Residential buildings as independent units were mainly built. Nevertheless, there were realized several examples of collective housing complexes on the periphery of old Belgrade as well, such as Julino brdo, Banjica, Cerak vinogradi, etc.

Institution of concourses for design of the housing buildings was very important for the development of housing typology, but also evolution of the apartment plan. During the post-war period, the so-called Belgrade flat, although already appeared in the Inter-war period, was further developed and improved. As architect Mate Baylon said in 1946 "We are not starting from scratch - we are continuing with our work" [2]. In the first post-war years, the main improvement was the implementation of the existence minimum - "Die Wohnung für das existenzminimum", the concept that was presented already in 1929 on the second CIAM congress in Frankfurt. Irregular shapes, uneconomical size and height, unspecified function of the rooms, etc. were characterised as inappropriate elements in the new flat type. Conceptually, the new flat ideas were close to the ideas of J. J. P. Oud in Rotterdam in 1920s, conceptions of "Siedlungen" realized in Berlin in 1929, Siemensstadt and the Weissenhofsiedlung in Stuttgart in 1927 [8]. The conference of cities of Yugoslavia was important for presentation of international achievements and to discuss them. Several Yugoslavian architects were in Sweden in 1955 in order to meet the local (Swedish) housing experience. As a result "Housing in Sweden" was published in 1956 [9]. A very important element of the Belgrade flat, the so-called expanded communication, was for the first time presented by Mate Baylon in 1960 on the conference of FAO organised by the United Nations. However, this element can be noticed also on the plans of the Swedish flats. In the latest years of Belgrade modern architecture, the Belgrade school of architecture was determined. As Aleksej Brkić explained in his book "Znakovi u kamenu", where he presented the evolution of Yugoslavian Modernism, in the third phase 1965-1980 the convergence of different directions of development defined the new formation, whose program only in principle can be included in conventional definitions of modern architecture [10].

#### **4. Selection of Modernist Housing Buildings in Belgrade**

Through the periodization and classification of selected buildings of modernist housing in Belgrade, the development of Modernism in Belgrade will be further analysed. The analysis will be done through the key-point buildings in the process of development of Modern Architecture. The main selection criteria for chosen modernist realizations was their importance in historiography of

modernist housing in Belgrade - the first or the most representative examples. The key-point buildings are the representatives of the emergence of modernity in the architecture of Belgrade, the emergence of the new housing typologies, the new constructions and materials. Beside their avant-garde character for the time and especially the context where they appeared, a strong overall representation of the modernist characteristics (applied elements of modern architecture) was an important criteria in the selection process. The analysis of the key-point buildings will be conducted through the two phases - representation and re-evaluation of each building. Representation will be done through the main architectural characteristics of the housing buildings: type of housing, form and structure/set/assembly of the building, organization of the flat, construction and building technology, composition of facade (artistry and visual identity) and applied materials. Reevaluation of the buildings needs to begin with this detailed documentation of historical, technical and architectural data for each specific building, in order to analyze how strong it represents modern architecture (overall characteristics, and specific elements) and thus be adequately evaluated. After the chronological interpretation, reevaluation will be further conducted through the classification of the buildings according to the defined criteria.

#### *4.1. Zloković's House, Architect Milan Zloković, 1927.-1928.*

The first selected building is Zloković's House designed in 1927 and realized in 1928. The selection criteria "importance in historiography of modern housing architecture in Belgrade" was fulfilled as it was the first modernist house in Belgrade. It represents break with the historicism and petit-bourgeois reality. Its avant-garde modernity fulfills the second criteria "strong representation of modern architecture". Architectural composition of volumes - dynamic crossing of two systems of the masses, creates dramatic appearance of architectural form. Non-ornamental cubic structure and planar treatment of the wall define it as an example of anti-expressive architecture. The organization of the house plan is according to the "free plan" concept. From main architectural composition of volumes, a new architectural element emerged - roof terrace. Implementation of this new element of urbanity, concrete garden, was real indicator of modernity of the house.

#### *4.2. Villa Vukosava for Professor Dušan Tomić, Architects Branko and Petar Krstić, 1930.-1931.*

Modernist villa Vukosava is chosen as a typical example to illustrate the design of villa housing typology in the Inter-war period in Belgrade. As it was already mentioned, not so many projects for modernist villas were realized in Belgrade. Even the small number of realized ones usually represent hybrid architecture. In the design of Villa Vukosava, the hybrid is created by crossing the traditional structural system and plan with an externally modernized form. The structural system is a massive load-bearing wall structure. The plan of the villa is compact with no exploration of the continuity of space, the upper floor only repeats the arrangement of rooms from below. However, the formal qualities of the villa are achieved, such as simple cubic composition with plain purist facades. The only architectural element that appeared on the facade as decorative was a curved portal at the entrance zone [2].

#### *4.3. Apartment block of dr Đurić in Prizrenska Street, Architect Branislav Kojić, 1933.*

As one of the most successful examples of Belgrade Modernism, Apartment block of dr Đurić is the next selected example of Modern Housing Architecture in Belgrade. The corner type building has strong relation to its context (site). The form is articulated by three parts functionally and formally separated: the horizontal corpus with public commercial program on the ground floor, the vertical corpus with private program - apartments, and the third as a concrete plane - shelter of the roof terrace. The composition is further articulated by the plasticity of the facade surface. With innovative flat organization, Kojić brought "European dimension" in local modernism. The type of windows that Kojić proposed in his modern project, were not realized. Instead, standard types were implemented. This detail represents the main weakness of local modernism - innovation of new details, technologies or materials could not be realized because of the building industry. "In condition of traditional building technique, architecture had no chance to advance beyond the first stage of simple formal

transformation, as there was no technology to instigate the fundamental structural change" [2]. One year after construction, the Kojić's building was declared as "the most beautiful facade", and therefore became ideal for modernist architects. Some similar elements of architecture can be noticed in the design of Dragiša Brašovan's Apartment block in Braće Jugovića Street [11].

#### *4.4. Apartment block in Svetogorska Street, Architect Momčilo Belobrk, 1938.*

The Apartment block in Svetogorska Street is one of the greatest examples of Belobrk's architecture. It is characterized by remarkably modernist and purist treatment of facade, with consistently implemented principles of functionalism. Pure form and cubic composition are characteristics of all 28 apartment blocks designed by Momčilo Belobrk and built in Belgrade in the short period 1932-1940. However, only this building has legal protection by the Institute for Protection of Cultural Monuments [4]. The apartment block is built-in block with exposed street frontage in one plane. Among the other Belobrk's blocks there are also corner blocks that are exposed as some volumes. All of the Belobrk's blocks follow the ideal *max-utility* and satisfaction of the necessities of economical manufacture [2].

#### *4.5. Residential building in Krunska Street, Architect Milorad Macura, 1953.-1955.*

The residential building in Krunska Street, is the first building of this housing typology built in Belgrade in the Post-war period. It is typical example of modernist functionalist residential architecture. With an uncompromising modernist approach, although built in historical part of Belgrade, the building had no attempt to fit into, or communicate with the environment. Clearly modernist identity is underlined by indrawn ground floor with the massive pillars, the cubic form, plastic treatment of the facade, applied color and modernist roof.

#### *4.6. Residential building in Braće Jugović Street, Architect Mihajlo Mitrović, 1964.-1967.*

The Residential building of Mihajlo Mitrović is the best example of applied typification of architectural elements. The facade openings were realized by application of the four types of doors that could be found on the market. The doors were than collaged and transformed into "French windows". The building has extremely important aesthetic and artistic value because of its facade composition - the 3D concrete prisms, as very unique detail, are carefully arranged on the brick surface that surround them.

#### *4.7. Residential block 23, Architects Aleksandar Stjepanović, Branislav Karadžić and Božidar Janković, 1968.-1974.*

As one of the earliest examples of the new architectural and residential typology - *block*, the block 23 was realized during 1968-1974 in New Belgrade. Within the block, as an urban unit, there were three different types of residential buildings: 6 high rise buildings (22 floors), 2 linear buildings (11 floors, 280m each, parallel to each other), and 2 meanders (5 floors). According to the building types, two main flat typologies were also defined: flats for the high rise buildings and flats for the other buildings as further development of Belgrade flat. The flats were arranged within the building in two tracts [9]. The double-tract building was an innovative building-unit type (by assembling the structure/set of the building) within the Belgrade School of Housing. The whole block is characterized by usage of the concrete as completely dominant material on those buildings. The strong brutalism of the block is refined with materialization of important construction connections and elements. The concrete as an absolutely dominant material is the most important part of the identity of New Belgrade blocks.

#### *4.8. Residential blocks 61 and 62, Architects Darko Marušić, Milenija Marušić and Milan Miodragović, 1971.-1973.*

Beside the already mentioned development of organization of flat, aesthetical values and the concrete-identity of the New Belgrade blocks, the development of technologies, industrialization and usage of the new prefabricated constructive systems was also characteristic for the blocks. One of the most innovative construction system –“IMS Žeželj“ system of prefabricated skeleton, developed in 1957 by

Branko Žeželj, was applied in the construction of the double-tract buildings within the blocks 61 and 62. Next to this building type, the architect applied a very specific type - terraced lamella within the blocks. They have different construction type - prefabricated panels. Facades of all buildings are the same - prefabricated concrete panels with integrated openings [9].

### 5. Classification of Modernist Housing Buildings in Belgrade

The first step in the classification strategy is to define criteria and sub-attributes. Classification methodology of the Le Corbusier's work nominated for the UNESCO World Heritage List was the role model [12]. In this paper the classification is adjusted to the specific topic of Belgrade Modern Housing. The 4 criteria, each with 3 sub-attributes, are defined.

- Criteria 1: importance in development of modernism in Belgrade; Sub-attributes: 1a-influenced as a master piece, 1b-strong influence to the local modernism, 1c-crystallization of a specific idea that had an exceptional impact;
- Criteria 2: implementation of modernistic aesthetic and the new architectural language; Sub-attributes: 2a-plastic and formal quality, 2b-spatial innovations, 2c-new housing typology;
- Criteria 3: modernizing architectural techniques and taking into account the challenges of mass production, standardization and industrialization; Sub-attributes: 3a-new construction system, 3b-typification (elements, but also in apartment organization), 3c-materials;
- Criteria 4: meeting the social and human needs of modern man; Sub-attributes: 4a-strongly related to social context, 4b-mass housing, 4c-norms and habitat minimum.

The attributes of the specific buildings are presented in the table 1.

**Table 1.** Classification of Modernist Housing Buildings in Belgrade.

	Criteria 1: importance in development of Modernism in Belgrade	Criteria 2: implementation of modernist aesthetic and the new arch. language	Criteria 3: modernizing arch. techniques, mass production and standardization	Criteria 4: meeting the social and human needs of modern man
<b>4.1.</b>	1a, 1b, 1c	2a, 2b	-	-
<b>4.2.</b>	1b	2a	-	-
<b>4.3.</b>	1a, 1b, 1c	2a, 2b, 2c	-	4a
<b>4.4.</b>	1b, 1c	2a, 2c	3b	4a
<b>4.5.</b>	1b, 1c	2a, 2c	-	4a, 4c
<b>4.6.</b>	1b, 1c	2a, 2b	3b, 3c	4a, 4c
<b>4.7.</b>	1a, 1b, 1c	2a, 2b, 2c	3a, 3b, 3c	4a, 4b, 4c
<b>4.8.</b>	1a,1b, 1c	2a, 2b, 2c	3a, 3b, 3c	4a, 4b, 4c

In the development of Belgrade Modernism, it can be noticed that aesthetical, formal and spatial attributes were constant, while social and human needs and development of modernist technologies emerged only in the second period.

### 6. Identification of Modernist Facade Patterns in Belgrade

A further contribution of this paper is the table of the modernist facade patterns (table 2). It represents the transformation of building technologies and applied materials on the facades of modernist housing buildings. As it was concluded in the classification of the buildings, modernist building techniques were only applied after World War II. Despite the diversity in housing typologies of the period, due to the mass housing construction, standardization and typification of elements were more than desirable. That was the period of industrialization of the country, technological development, and therefore development of the new construction systems, such as "IMS Žeželj" system of prefabricated elements of the skeleton, prefabricated panelised systems, etc. [13]. In the Inter-war period, buildings were constructed in traditional massive construction system. However, the appearance of the buildings of

the both periods and their final treatment - their facades, were the most modernist part of the architecture of those buildings.

**Table 2.** Typical Modernist Façade Patterns in the Inter- and Post-War Period.

Villa (1919-1941)	Apartment block (1919-1941)	Residential building (1945-1980)	Residential block (1945-1980)
			
4.1.	4.3.	4.5.	4.7.
			
4.2.	4.4.	4.6.	4.8.

Beside a few, however extremely important innovations - "Belgrade flat", architectural composition, cubist form etc., the truly modernist facades are the greatest achievement of the modernist housing buildings in Belgrade.

## 7. Conclusions

Residential buildings are one of the largest building stock in Belgrade, especially important when it comes to the modernist housing buildings. Between their strong relation with the past and contemporary (future) context, those buildings are disintegrating without any concept for their update. The buildings need a strategy for re-actualization. As the first step of the strategy, it is necessary to analyse and evaluate the buildings. Proposed evaluation methodology applied on the selected examples should be further improved and applied on more examples of modernist housing buildings in order to provide specific methods for future (re)use of each building. Evaluation should be conducted through the four steps: 1. values - define the most important values of the buildings related to modernism, indicate which specific architectural elements of modern architecture are included, and thus need to be promoted and preserved; 2. issues - define architectural elements of the (mainly) modernist buildings that represent the occurrence of the other styles, define the elements that need to be replaced (lifecycle of concrete and other materials, or elements of architecture); 3. problems - generally, the main problem of all modernist buildings is disrepair (weak regulations and no strategies for applied maintenance) or altering and transformation beyond the recognition (weak and usually inappropriate legal protection caused by only generally defined "rules" that do not take into consideration specific architectural values and issues of each building individually), and if there are additional specific problems, they should be noted; 4. potentials - methods and specific strategies as a result of the first three steps of the re-evaluation for each building.

In a next step of the research a specific focus of the (re)use of the buildings will be the renovation of their facades. The building envelope is a very important element in defining "revitalization strategies" [15]. Furthermore, it is recognized as the most valuable element of the modernist housing buildings in Belgrade in the classification of them. The common problem in defining renovation strategies is the conflict between energy and comfort improvement on one side, and aesthetic and architectural values on the other side. In order to provide an integrated methodology, all aspects need to be carefully analyzed, as it was already described. Rethinking housing typology is also necessary according to the

contemporary housing needs. The modernist buildings should not be perceived as a closed system of one time that passed, but as an open system of the presence.

## References

- [1] "World Heritage papers 5: Identification and Documentation of Modern Heritage", Compiled and edited by R. van Oers and S. Haraguchi, Published by the UNESCO World Heritage Centre, 2003. In the Introduction to the Programme on Modern Heritage, R. van Oers stated: "This heritage is considered to be particularly vulnerable because of weak legal protection and low appreciation among the general public."
- [2] Lj. Blagojević, *The Elusive Margins of Belgrade Architecture 1919-1941*, The MIT Press, 2003.
- [3] W. Thaler, M. Mrduljas, and V. Kulic, *Modernism In-Between: The Mediatory Architectures of Socialist Yugoslavia*, Jovis, 2012.
- [4] D. Mecanov, "Valorizacija arhitekture stambenih zgrada iz perioda moderne" ["Valorization of the architecture of modern residential buildings"], *Nasleđe*, (11), pp. 79-101, 2010.
- [5] V. Kulić, "An Avant-Garde Architecture for an Avant-Garde Socialism: Yugoslavia at Expo '58", *Journal of Contemporary History*, (47-1), pp. 161-184, 2012.
- [6] Lj. Blagojević, "The Capital of No-City's-Land", *Art-e-Fact: Struggles of Resistance*, 2004.
- [7] "Zaključci Prvog opštejugoslovenskog savetovanja o stambenoj izgradnji i stanovanju" ["Conclusions of the First Yugoslav Conference on Housing and Dwelling"], *Komuna* (Belgrade), no.3, pp. 5-8, 1956.
- [8] D. Mecanov, "Mogućnost (re)definisivanja i predlog periodizacije graditeljskog nasleđa" [The potentials for (re)defining and the proposition for periodization of cultural heritage"], *Nasleđe*, (8), pp. 151-170, 2014.
- [9] Časopis: "Arhitektura i Urbanizam", 74-77, Savez društava arhitekata Srbije, Urbanistički savez Srbije i Udruženje likovnih umetnika primenjenih umetnosti Srbije, Beograd, 1975.
- [10] A. Brkić, *Znakovi u kamenu: Srpska moderna arhitektura 1930-1980* [The signs in stone: Serbian modern architecture 1930-1980], Beograd: Savez arhitekata Srbije, 1992.
- [11] K. Bunjak, V. Panić and M. Pešić, "Beogradska Moderna (period 1930-1940): Elementi ekološke arhitekture u projektovanju višeporodičnih stambenih zgrada i pitanje njihove održivosti u svetlu aktuelnih klimatskih promena" ["Belgrade Modern (period 1930-1940): Elements of ecological architecture in design of multi-family residential buildings and the issue of their sustainability in the context of actual climate changes"], *Uticaj klimatskih promena na planiranje i projektovanje*, Arhitektonski fakultet, pp. 167-185, 2011.
- [12] Group of authors from Argentina, Belgium, France, Germany, India, Japan, Switzerland, "The Architectural Work of Le Corbusier: An Outstanding Contribution to the Modern Movement", Nomination file for the inscription on the World Heritage List UNESCO, 2015.
- [13] D. Mecanov, "Uticaj sistema prefabrikovane gradnje na arhitekturu Beograda" [Impact of the prefabricated construction systems on the architecture of Belgrade"], *Nasleđe*, (17), pp. 97-124, 2016.
- [14] U. Pottgiesser and J. Kirch, "Renovating Modern Movement Facades", *Old and New Design Manual for Revitalizing Existing Buildings*, Boston, Basel: Birkhäuser, pp. 118-129, 2010.
- [15] U. Pottgiesser, "Revitalisation Strategies for Modern Glass Facades of the 20th Century", Proceedings STREMAH 2009 Eleventh International Conference on Structural Repairs and Maintenance of Heritage Architecture. Southampton: WIT Press, pp. 569-580, 2009.