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XIII НАУЧНО - СТРУЧНА КОНФЕРЕНЦИЈА
СА МЕЂУНАРОДНИМ УЧЕШЋЕМ

**„ПОЛИТИКА И ПРОСТОРНИ РАЗВОЈ НА
ЛОКАЛНОМ НИВОУ: ТРАНЗИЦИЈА У
СРБИЈИ И ИЗАЗОВИ 21-ОГ ВЕКА“**

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Покровитељ:

МИНИСТАРСТВО ПРОСВЕТЕ,
НАУКЕ И ТЕХНОЛОШКОГ РАЗВОЈА



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ШТАМПАЊЕ КЊИГЕ ОМОГУЋИЛО

МИНИСТАРСТВО ПРОСВЕТЕ, НАУКЕ И ТЕХНОЛОШКОГ РАЗВОЈА

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КОМПЛЕКСНЕ ТИПОЛОГИЈЕ САВРЕМЕНОГ СТАНОВАЊА **Модел за хибридне стамбене склопове**

COMPLEX TYPOLOGIES IN CONTEMPORARY HOUSING

A Model for Hybrid Housing Configuration

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АПСТРАКТ

Истраживање које је спроведено у овом раду има за циљ да истражи потенцијале сложених стамбених склопова за пројектовање и развој савремених насеља. Истраживање је спроведено у сврху учешћа на Отвореном међународном конкурс за дизајн стандардизованог становања и станоградње (*Open International Competition for Standard Housing and Residential Development Concept Design*) у Русији, који је организовао Институт Стрелка у децембру 2017. године.

У раду се развија упоредна теоријска анализа типова станова у Русији и Југославији друге половине XX века, (стамбени објекти Хрушчовке и новобеоградска становања) са циљем изградње платформе и полазишта за савремене моделе становања. Ово истраживање види потенцијал у одабиру и комбиновању специфичних аспеката модернистичке доктрине становања за савремене моделе становања, кроз компоновање сложених, хибридних конфигурација. У раду је такође развијена теоријска позиција хибридности као посттиполошког стања у архитектонском дискурсу. У овом случају, хибридност се разматра и у контексту програма, и у контексту форме.

Савремени живот подразумева нове методе и моделе становања који превазилазе конвенционалне типолошке праксе, стога ово истраживање предлаже сложене конфигурације како би се одговорило на савремене потребе свакодневног живота. Приказано истраживање преиспитује статус префабрикованих, предефинисаних структура стамбених насеља (Хрушчовке), отварајући теме о трајању, одрживости и наслеђеним типовима становања у контексту прилагодљивих капацитета за савремене потребе становања.

Горе објашњено упоредно истраживање даље се развија као истраживачко питање кроз конкурсно решење. Пројекат је развијен кроз просторни принцип који се, у зависности од просторних околности, може комбиновати и организовати у различитим конфигурацијама.

Кључне речи: *хибридност, становање, посттипологија, сложене структуре становања.*

ABSTRACT

The research that is conducted in this paper aims to investigate the potentials of complex housing configurations for designing and developing contemporary, dynamic neighborhoods. Research is conducted for the purpose of participating in an *Open International Competition for Standard Housing and Residential Development Concept Design* in Russia, organized by the Strelka Institute in December of 2017. The paper develops a comparative theoretical analysis of housing types in Russia and Yugoslavia of the second half of XX century, (Khrushchyovka residential developments and New Belgrade housing) with the aim of constructing a platform, and a departure point for contemporary housing Models.

This research sees the potential in selecting and combining specific aspects of modernist housing doctrine for contemporary housing models, through composing complex, hybrid configurations. Theoretical position for hybridity as a post-typological condition in architectural discourse is also developed in the paper. In this case, hybridity is considered both in the context of the program, as in the context of the form (vertical and horizontal).

This paper argues that contemporary living implies new methods and models of housing that transgress conventional typological practices and involves complex configurations in order to address the contemporary needs of everyday life.

Presented research questions the status of prefabricated, over-defined structures of Khrushchyovka residential developments, opening the topics of duration, sustainability and inherited types of living in the context of adaptive capacity for contemporary dwelling needs.

The above-explained comparative research is further developed as a research by design through the competition proposal. The design proposal is developed as a spatial principle that, depending on the spatial circumstances, can be combined and organized in different configurations. Therefore, three suggested types are developed as variations of the principle.

Keywords: *hybridity, housing, post-typology, complex housing configurations*

INTRODUCTION

The period of socialism is marked by social transformation and accelerated socialist industrialization, which pushed the personal standard into the background and the lack of housing, became the primary problem. In the 1950s, the basic model of housing was based on the ideological premises of a classless society, egalitarian standards, centralized state-party planning management of funds and distribution of investments and apartments, liquidation of markets and rents in collective housing patterns in the socialist city.

In relation to these design experiences, today we have to ask the question what is the future of mass prefabricated construction of settlements as the dominant pattern of housing in that period. These issues are becoming dominant in contemporary discourse, and one of the main conclusions of the international forum "Living Environment: The New Standards" held in 2016 in Russia is that standards and standardization is not the same thing. These conclusions have been reformulated into a very clear list of recommendations and programs of legislative reforms. These requirements are focused on the quality of housing construction and that the spatial comfort is defined by the designer without the restrictions imposed by the standards for the design of buildings. Today, the big question is whether we can still talk about three clear categories of apartments S, M and L, because each user needs a different apartment, and therefore the design must be flexible and follow that request.

We need to build buildings that have the potential for change, – the head of the SPEECH architectural firm, *Sergey Choban*, agrees. – A columned carcass, which replaces supporting walls, will make the renovating the interior of an apartment interior easier, and it will simplify shifting the building's function. If the demographic situation deteriorates, there will always be the capability of turning a residential building into an office or a public institution. Yet another point that almost all experts agree on is that every region should consider creating its own standards for quality construction (or, at least, adapting the existing federal norms for their needs), which would take the population's lifestyle, existing infrastructure, and climate of the area into account.

COMPETITION INITIATIVE: THE STATUS OF MASS HOUSING IN RUSSIA

Soviet housing is outdated. Why? Because the buildings were built as prefabricated, over-defined structures, with low adaptive capacity for contemporary dwelling needs. Relating to this, City of Moscow is planning on demolishing Khrushchyovka residential developments.

"Khrushchevka" is a colloquial name for a prefabricated residential structure made of prefabricated elements characterized by medium-rise (five-storey residential building) and medium density. The housing complex was named after the then Soviet leader Nikita Khrushchev, who implemented this ambitious state apartment project for every Russian family, which was realized throughout the USSR over 10,000 times.

If we talk about the motives for announcing the competition, we must get acquainted with the circumstances that led to the decision to demolish 7,900 Soviet flat blocks in Moscow are to be torn down, in what will be one of the largest urban resettlement programs in history. As Guardian reported, Moscow mayor Sergei Sobyenin, With the backing of the president Vladimir Putin, has declared the program an "absolute necessity" to replace aging housing. He promised the replacement flats would be 20% larger on average.



Figure 1: Khrushcheyvka standard types are classified into "disposable", with a planned 25-year life (сносимые серии) and "permanent" (несносимые серии). This distinction is important in Moscow and other affluent cities, where disposable Khrushcheyvkas are being demolished to make way for new, higher-density construction. Photograph: Andrei Makhonin/Tass

Such a decision had to have political support in order to be implemented and understood as a state project. In this research, the thesis is set on the problems that led to these blocks being overcome without a perspective for reconstruction and adaptation. The competition brief was expected by the Development of architectural concepts of residential buildings for one of the urban environment target models in accordance with the Standard for Integrated Development of Territories. Developed by the DOM.RF (National Institution for Housing Sector Development Foundation) in cooperation with KB Strelka.

The Standard provides three target models: low-rise residential, mid-rise residential and central. Each participant of the Competition develops up to 4 types of apartment houses for the urban environment target model that they have selected during the registration process.

The purpose of the Competition is to create innovative, sustainable housing that meets modern requirements for providing comfort and security of the living environment completed with the use of advanced construction technologies. The Competition participants have the task of creating optimal planning solutions that will be easily adapted to different urban contexts and climate conditions, as well as to the changes introduced during the project implementation phase.

HISTORICAL ANALYSIS OF HOUSING TYPES IN RUSSIA AND YUGOSLAVIA OF THE SECOND HALF OF XX CENTURY

The advancement in building technology and changes in housing regulations made continuous changes in standardised mass housing in USSR since the initiation in 1950s. Prefabricated mass housing survived, even though large-scale prefabrication was not the only way of building new housing stock. For instance, by 1975, after prefabrication had become established, industrial large-panel construction accounted for only about half of the total volume of state and cooperative housing construction in the USSR (*Zhukov and Fyodorov, 1974: 36*). Reinforced-concrete walls only became dominant in the generation of buildings constructed in the 1970s (*Kalyukin and Kohl, 2020: 1777*).

The overall preoccupation with economies of scale in the quest for the most efficient investment meant that centralisation and concentration tendencies prevailed over the decentralisation interventions intended to harmonise (and equalise) the urban system (*Enyedi, 1996*).

The need for new housing was paramount, therefore the main reasons for prefabricated mass housing projects are completion time and cost reduction, having in mind that individual tailored projects are slow and traditional building techniques are labor-intensive and costly. It was not until Khrushchev's housing decree of 1957 and the nascent industrialisation of housing construction that fully fledged prefabrication of multi-storey houses (*khrushchevki*) became the Soviet building standard (*Kalyukin and Kohl, 2020: 1777*). Development of low-cost and fast building technologies was declared the main objective of Soviet architects in the beginning of the 1950s when Nikita Khrushchev was the Communist party director of Moscow. The overall preoccupation with economies of scale in the quest for the most efficient investment meant that centralisation and concentration tendencies prevailed over the decentralisation interventions intended to harmonise (and equalise) the urban system (*Enyedi, 1996*).

In this period different experiments were conducted with construction methods with the aim of time and cost reduction. Prefabricated industrial large-panel construction concrete panels turned out to be superior to other methods.

Prefabricated 5-story buildings became typical of the Khrushchyovka. 64,000 units (3,000,000 m² (32,000,000 sq ft)) of this type were built in Moscow from 1961 to 1968. In years to come these building types switched to 9 or 12-story buildings on the account of space limitations in Moscow, so the last 5 storey Khrushchyovka in Moscow was built in 1971.

The period of socialism in Yugoslavia was marked by social transformation and accelerated socialist industrialization, which pushed the personal standard into the background, and the lack of housing stock became the primary problem. In the 1950s, the basic model of housing was based on the ideological premises of a classless society, egalitarian standards, centralized state-party planning management of funds and distribution of investments and apartments, liquidation of markets and rents in collective housing patterns in the socialist city. In that period, until the mid-fifties, housing colonies were built in Yugoslavia as the predominant pattern of housing of modest and rational comfort, and the construction of popularly called new cities began. In the following decades, with the increase of the overall social and personal economic standard, the procedures of planning, construction and distribution of apartments were partially decentralized, but did not go beyond the systemic framework. In the context of intensive urbanization, multi-family housing and the construction of large housing estates on new urban areas were still favored, with the help of serial prefabrication and standardization technology, which dominated the period of socially oriented housing construction. Housing structures were standardized and typologically unified, and with the suspension of private property and the market mechanism, their social distribution was based on ideological criteria of social mobility, which, if not directly generated, did not prevent more noticeable social inequalities in housing (*Vujović, 1987*). Individual housing construction in large cities was relatively limited.

In the sixties, the first housing reform was done, which included changes in the system of financing housing construction, and competencies were transferred from the state to city and municipal funds, which were supplemented by state-owned enterprise contributions. New prefabricated construction prefabrication systems were being built in New Belgrade, Banovo brdo, Konjarnik, Braće Jerković, Šumice, etc. Settlements of predominantly collective housing with a density of 250-500 inhabitants per hectare, the urban type open block with an average number of storeys from P + 3 to P + 4 was applied, and compositional accents of storeys up to P + 14 were used. The apartments were of

different structures but predominantly standardized, the most common were two-bedroom apartments with an area of 60m², adapted to the industrialized way of building uniform architecture. The "Rulebook on minimum technical conditions for the construction of apartments", was accepted in 1967. Certain changes in the political system that followed in the early 1970s also influenced the socialist model of the housing and communal economy. Intensive housing construction continued according to the described physical patterns, with uniform but very ambitious standards (GUP Belgrade from 1972 predicted an increase in the average area of the apartment from 45m² to 58m² for the period 1971-2000).

The period of socialism in Yugoslav and USSR societies, with the population's availability for their own apartment was completely different in relation to Western European models of housing. From the analysis of experiences from the socialist period important for future concepts of affordable housing, we can single out some highlights:

- Enormous energy was invested to harmonize urban, architectural, construction and economic standards, unlike other environments where the standards were differentiated, which enabled affordable arrangements for different social groups and active reproduction of the housing stock.
- Local regulations on minimum housing standards for the construction of apartments favoured the structure of the apartment instead of the minimum footprint. The dimensions showed the size of the apartment, which was conditioned by the number of rooms in the apartment; the minimum height of the apartment from the finished floor to the finished ceiling cannot be less than 2.40m.
- The attempt to achieve the profitability of housing construction relied on the application of high housing densities and industrial production of apartments. Without land rent, there was no accumulation in funds for equipping and arranging land, so the vast majority of costs were borne by builders and buyers of new apartments. The city waived urban rents from most different land users, and partially charged only a small portion of utility contributions, burdening the production cost and the ability to reproduce new housing. The market model, viewed from a modern context, implies the reverse order of things.
- In relation to political and ideological circumstances, the structure and form, ie. the typology of housing patterns from the socialist period, was narrowed and almost unified into two basic types: larger settlements, multifamily housing in large open blocks and detached family housing units.

It is important to emphasize that mass housing models in Yugoslavia and USSR differed significantly on the basis of building quality, density and apartment structure, in relation to the political emancipation of Yugoslav communist party from the Eastern block, or the so-called Tito-Stalin split. While for decades after its inception, mass housing in the USSR maintained low quality as a result of reduced costs and time invested, housing in Yugoslavia gained new qualities and improvements over time in terms of both construction technology and housing conditions and quality.

CONTEMPORARY HYBRID CONFIGURATION IN HOUSING ARCHITECTURE: FROM TYPOLOGY TO HYBRIDITY

This research sees the potential in selecting and combining specific aspects of modernist housing doctrine for contemporary housing models, through composing complex, hybrid configurations. Hybrid architectural configurations are developed in order to address housing needs that are in accordance with contemporary conditions. Theoretical position for hybridity as a post-typological condition in architectural discourse is also developed in the paper. In this case, hybridity is considered both in the context of the program, as in the context of the form.

Deconstructing typology through transgressing the framework

Architect Bernard Tschumi, by quoting George Bataille, opens the possibility of transgression in architecture, where transgression is complementary to the profane world, crossing its borders, but not pushing them (*Tschumi, 2004*). So, the transgression offers the possibility of an architectural object to overcome imposed boundaries, that is, the boundaries of the social order, although this architecture recognizes and thus affirms those borders. The architectural position of Bernard Tschumi is important for this research primarily because the notion of function is in Tschumi's theory translated into the notion of scenario. Namely, in one of his early theoretical projects - *The Manhattan Transcripts (1976-1981)*, Tschumi proposes images through which he records an architectural interpretation of reality, whereby using the drawings he tries to signal the movement of the actors through the architectural scene, like in a screenplay scenario. This is a significant process for architecture, because instead of function, the object of architecture is determined by the script. Thus, Tschumi paradigmatically changes the logic of architectural design, whereby the assigned function of a predetermined object of architecture becomes secondary to the variety of program capabilities offered by the space of architectural object. From this, Tschumi develops the concept of transgression in architecture, not only in relation to the previous postulates of the profession, but also in relation to cultural context.

Typological eclecticism: hybridity in architecture

This research by design project develops a theoretical position for hybridity as a post-typological condition of predefined housing architecture of socialist period. In this case, hybridity is considered both in the context of program, as in the context of form (vertical and horizontal).

A critique of typology based architectural design defined through a design methodology that excludes the typological analysis that is carried out in various hybrid architectural structures, evolved from the need to identify architectural production with contemporary social circumstances, through the predominant criterion of commercialization of architectural space, primarily on the basis of architectural form. The concept of hybridity is derived from natural sciences, more precisely from biology, and it refers to the emergence of new species, most commonly plant, crossing existing species.

Hybridity in architectural sense can be defined as eclectic process that allows synchronized synthesis of heterogeneous types (architectural syntaxes) into (new) architectural configuration-typology. Moreover, hybridity in architecture can be conceived as a trans-typological design process that utilizes typologically predetermined architectural syntaxes that together form a configuration that is not typological, but hybrid: for instance, a garage-swimming pool, or a stadium - shopping centre. The difference between the hybrid and the multifunctional architectural configuration is primarily manifested through the conditions characterized by the liberal model of city building and city planning: profit, density, and centrality (attractiveness) of the spatial urban context. Therefore, the multifunctional shopping mall on the city periphery cannot be considered a hybrid. Joseph Frenon thinks that the hybrid type represents a response to the metropolitan pressure of the escalating value of urban land in relation to urban tissue restrictions and regulations (*Frenon, 1984: 6*). Such spatial manifestation of capital can be considered emblematic for the global socio-economic circumstances since the beginning of the 21st century.

The research by design project for new housing model presented in this paper confirms the hybridity of such architectural structure through the complexity of programme and variations of housing types. Hybridity of this housing structure is developed through combining different types of housing into a common hybrid configuration.



Figure 2: Shopping mall Vozdovac in Belgrade can be taken as an example of a hybrid architectural configuration, on top of which the football field is located. Namely, in the place of the former stadium, due to commercial reasons, a shopping mall was built, while the football field was placed on the rooftop. Although, for objective reasons, this complex cannot be considered as an example of good architectural practice, this specific functional operationalization of capital in urban context (and vice versa) can be considered emblematic for the socio-economic framework of the second decade of the 21st century in Serbia.

CASE PROJECT: COMPETITION PROPOSAL FOR NEW HOUSING MODELS

This kind of architectural approach is exempt from the discussion of forming the urban block. In relation to specific parameters of the competition brief, every unit is oriented towards healthy living: every unit gets good insolation and aeration. Instead of discussing formalization of the urban block, this proposal aims to maximize all potentials of a complex configuration that forms a dynamic neighborhood. The space that surrounds the fragmented, porous structure can be programmed in various strategies- spaces of recreation, leisure, sports and culture.

Formally, the structure is composed of three main layers. Main, three level-high: 1. Linear corpus is elevated atop of a 2. Base- pediment. Basis presents a particular kind of platform that follows the slope of the ground using ramps and stairs and thus establishes a connection and defines the contact of the structure with the ground. Rooftop spaces of the main apartment corpus are designed as 3. roof garden village with fragmented duplex units with gardens.

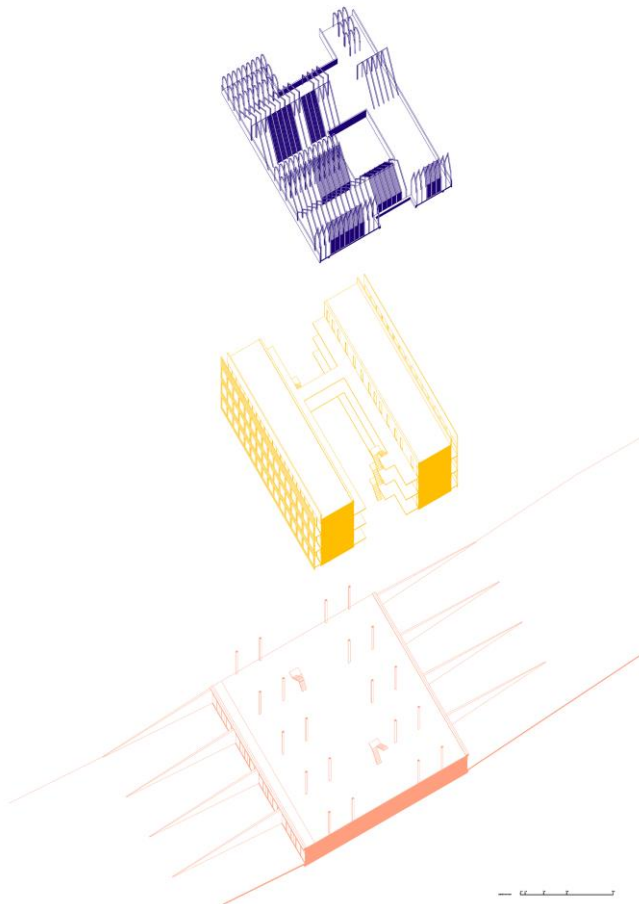


Figure 3: Structure

In terms of HOUSING, this project differentiates two typologies:

- Configuration typology
- Unit typology

Configuration typology

Typical organizations were developed through overall standardization of designing and building. Standardization implies generalization, which resulted in low adaptability and rigidity of housing types in question, in which even the minor spatial solutions are standardized and predefined. Jeremy Till criticises this approach as a process of designing hard space, which prohibits the users to adopt the living space. (*Schneider, T. and Till J. 2007*).

Nevertheless, typological classification of apartment buildings is commonly conducted through their morphological properties in relation to the surrounding built environment: linear, detached, semidetached, row housing, high-rise. Theory and practice that influenced the architectural education during 70s and 80s in the Faculty of Architecture in Belgrade inclined towards classifying the housing architecture based on its functional logic, rather than its morphology. In this sense, several main types were developed (*Stojanović, Stamenović, 2015*):

Configuration typology can be developed in three different types, which correspond to three types suggested by the competition brief:

- Urban villa = Freestanding configuration type
- Section with gallery access = Gallery type
- Section with central access Corridor = Double open corridor type

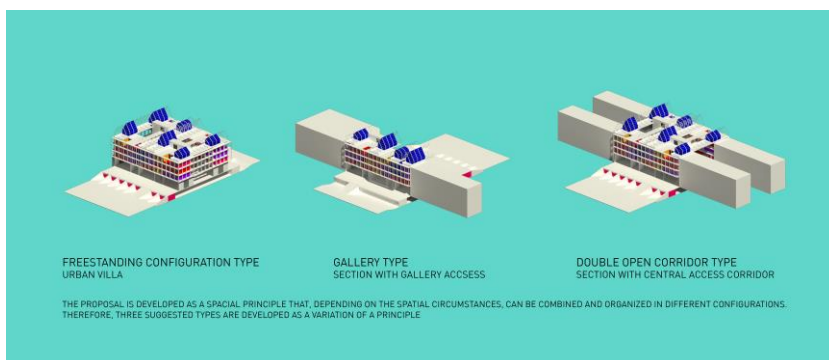


Figure 4: Configurational Typology Scheme

The proposal is developed as a spatial principle that, depending on the spatial circumstances, can be combined and organized in different configurations. Therefore, three suggested types are developed as VARIATIONS OF THE PRINCIPLE.

Variation 1: Urban villa = Freestanding configuration type

FREESTANDING (HIGH-RISE) TYPE

Free-standing housing type is characterized by optimal orientations of apartments, which as a rule can have at least a double orientation. The central core with vertical communications is open and represents an extended living space. The height can defer depending on the urban context and density regulations and needs. In relation to the urban environment, the free-standing type requires more space around it and greater distance in relation to neighboring buildings. Preferred floor number can range between GFL+2 to GFL+12.

Variation 2: Section with gallery access = Gallery type

OPEN-CORRIDOR TYPE

This type was formed as advanced model of a linear corridor tract. It accomplishes lesser density of settlement and building than corridor type with unfavourable relation of gross and net surface, floor number is between GFL+2 to GFL+6. The characteristics of this type are directed to the understanding of a common space as an extension of private space. They are the result of a desire to loosen the contrast between the private and public space, which directly influenced the circulation space to become open and understood by users as common (semi-private). The open corridor facilitates direct twofold orientation, and the possibilities of inner organization are most favorable.

Variation 3: Section with central access Corridor = Double open corridor type

DETACHED DOUBLE-LINEAR TYPE

This type has been formed as an advanced model of a linear corridor tract. It accomplishes high densities of settlements and building with a bit less favourable gross and net surface relation, the floor number varying between GFL+4 to GFL+6. Separated corridor enabled inner shaft, which influenced the logic of the apartment, where the dual orientation influenced the forming of circular flow in the apartment so that the sanitary block and kitchen gain direct light and ventilation.

Unit typology

In order to maximize the utilization of existing surfaces and provide for better housing conditions, a system of gallery components is proposed. The used scheme of circulation combines corridor and gallery system i.e. semi-open, covered, illuminated and ventilated corridor along the entire building from which it is directly accessible to every apartment unit. The organization of units is based on a clear differentiation of service and residential areas, with the two-way orientation of all apartments, aimed at natural lighting and ventilation of all residential areas. One of the determinants in the planning of apartments is the flexibility of space, i.e. the variability of the organizational scheme according to which an adequate constructive system (skeletal) was adopted.

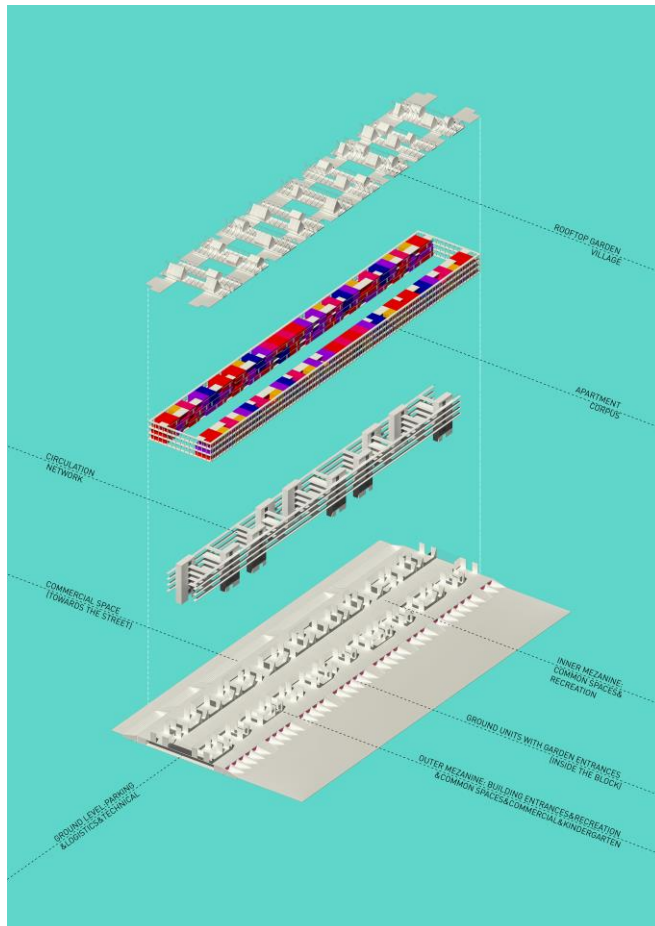


Figure 5: Unit Typology Scheme

Unit typology consists of 3 different types of units:

- **Base units:** These housing units have a direct contact with the ground. The logic of housing that is in the immediate link with the ground implies that a part of the soil that is at our disposal is becoming an area of everyday life, and this piece of land becomes a yard.
- **Apartment corpus units:** Apartments are primarily oriented towards the outside, vertical circulations are positioned within the central atrium - units are connected through the gallery. The galleries are conceived as semi-enclosed spaces that provide comfort and climate and temperature moderation from atmospheric influences. The configuration allows for the dual orientation and ventilation of all housing units.

- **Roof garden village units:** Fragmented house-like duplex units emulate garden environment, in which life revolves around the garden. These units represent a contemporary notion of urban farming and ecological living. In terms of building configuration, the proposal can be developed in three different types, which correspond to three types suggested by the competition brief.

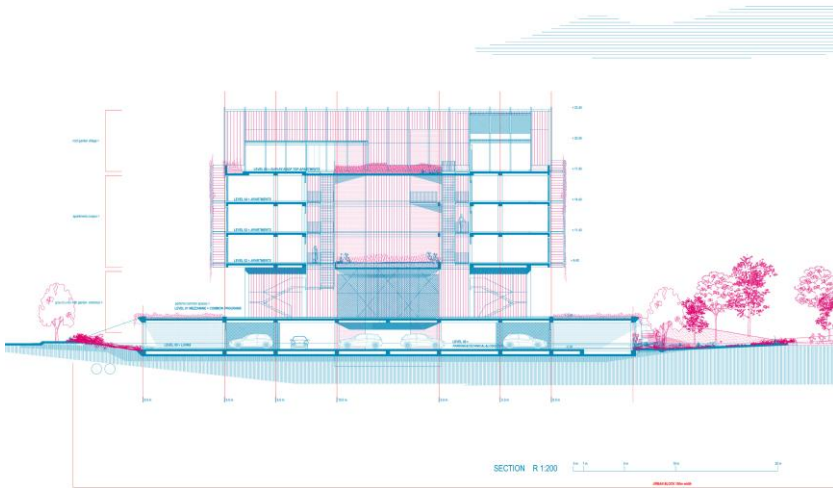


Figure 6: Unit Typology position

OUTPUTS: COMPLEX TYPOLOGIES IN CONTEMPORARY HOUSING

This research sees the potential in selecting and combining specific aspects of modernist housing doctrine for contemporary housing models through composing complex, hybrid configurations.

This paper argues that contemporary living implies new methods and models of housing that transgress conventional typological practices and involves complex configurations in order to address the contemporary needs of everyday life.

We live in a time when people renovate their *khrushchyovkas* and stay in them, although, this is probably caused by the high cost of new apartments, rather than a connection to their roots. All the architects agree on one thing: buildings should be constructed for the long term. According to all of them, creating low-quality buildings and demolishing them 20 years later is the least ecological approach.

By analysing the data that define the individual average duration of the elements that make up the lifespan of an average residential building (AIA Guide to Building Life Cycle Assessment in Practice, Georgia Institute of Technology, 2010) we find that the durability of the elements varies between 110 years as the foundations last, and 13 years as the expected duration of fibrous floor coverings. Despite the fact that a large part of the housing stock is older than 20 years, and the average age is about 50 years, the duration of an architectural object in proportion to the individual guaranteed duration of the building elements in most cases is only 30 years.

It is clear that by replacing individual, short-lived elements, that time is extended. However, despite the relatively short lifespan of a typical residential building, the dynamics that characterize its use in a contemporary context always require change.

The main issue with prefabricated mass housing buildings such as *khrushchyovkas* is the fact that they are insusceptible to change; they are rigid both in structure and in spatial organisation. In this regard, these buildings can be maintained and refurbished, but still they do not fit the needs of their contemporary inhabitants.

The question remains: do we preserve prefabricated buildings as a historical value and a testament to modernization and technological progress? Should we demolish the last *khrushchyovka*?

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