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THE COMPLEXITY OF URBAN INFILL: CASE STUDIES OF THREE APARTMENT BUILDINGS

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THE COMPLEXITY OF URBAN INFILL: CASE STUDIES OF THREE APARTMENT BUILDINGS

ABSTRACT

The process of infill within the built environment represents a fundamental and increasingly indispensable approach to sustainable societal and environmental development. Although rooted in past practices and experiences of modern urbanization, its methodological frameworks must be continuously reinterpreted in response to climate change and contemporary modes of living. In this context, the re-examination of both architectural heritage and professional practice becomes essential, ensuring that sensitivity, creativity, and innovation remain central to design strategies.

This paper examines the evolving approaches to integrating new structures within existing built environments, arguing that such integration should arise not only from aesthetic alignment with the surrounding context but also from the dynamic interplay between interior and exterior spaces, reflecting both everyday practices and environmental change. Focusing on three residential projects in small-scale urban environments, the study employs a methodological framework based on the analysis of ambient conditions, design principles, and spatial outcomes. The findings demonstrate how urban infill can simultaneously preserve the character of local communities while meeting contemporary functional and environmental demands.

Keywords: *housing, infill, environment, heritage, sustainable*

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1. INTRODUCTION

The challenges of the twenty-first century—arising from globalization, sustainability imperatives, and the rapid advancement of digitalization—pose fundamental questions for architectural practice regarding what must be transformed and how such transformations should be enacted within existing built environments. Within this context of spatial transformation, architectural approaches to inherited structures over the past century have undergone significant theoretical and practical reconfigurations, shaped by evolving cultural paradigms and diverse local worldviews. These shifts have continually aimed to refine design methodologies that safeguard the historical and cultural landscape, while simultaneously ensuring its relevance to contemporary spatial and social realities. Predominant considerations and strategies for construction within existing urban fabrics were guided by the principle that new interpolations should maintain a discernible relationship with the established urban core and its architectural heritage [1, p. 142]. Concurrently, debates emphasized that such interpolated structures ought to avoid engaging in the aesthetic revival of traditional forms [2, pp. 16-17], advocating instead for a contextual approach that balances continuity with contemporary expression.

However, as the role of cultural and built heritage evolves within processes of spatial transformation and sustainable development—becoming both a driving force and a source of inspiration in integrative approaches to conservation and urban development—it increasingly serves as a framework for innovative architectural practice and as a catalyst for reconciling tradition with contemporary needs [3]. Today, considerations extend beyond cultural history or the cultural landscape: innovative technologies, environmentally friendly materials, and sustainable construction techniques are equally crucial. The role of heritage is not only to guide transformations but also to contribute to achieving the United Nations Sustainable Development Goals.

The paper seeks to address how the vitality of space can be preserved when interpolating new structures within semi-urban areas with a pronounced sense of identity, proposing new approaches to architectural problem-solving and design thinking. The structure of the study is developed on the premise that contemporary environmental challenges expand the dialogue between old and new, such that, in synergy, both assume an active and vital role in the development of sustainable societies and places.

Unlike the expansion of city zones, such interventions offer opportunities to revitalise existing spaces and preserve urban identity. Numerous examples demonstrate that integrating new content—such as public spaces, buildings, and complexes—into the existing urban fabric can enhance spatial functionality while reinforcing cultural and social significance. In contexts marked by pronounced architectural and cultural layering, the interpolation of new structures requires a high degree of architectural sensitivity and creativity. An additional challenge lies in the economic context in which these projects are realised. In transitional societies such as those in the Western Balkans, investors are typically private entities from the real sector, resulting in the predominance of market-driven interests over spatial, social, and ecological considerations. It is therefore crucial to continuously reassess the processes of integrating new and existing elements—not only in terms of aesthetics and spatial relationships, but also in terms of functionality, sustainability, and social relevance. In the context of climate change and global efforts toward sustainable development, the question of architectural interpolation takes on a new dimension: the comfort of contemporary housing can no longer be considered separately from environmental sustainability and the responsible use of resources.

2. METHODOLOGICAL APPROACH

This paper examines the integration of new structures within existing built environments, emphasizing the preservation of cultural and spatial identity amid ongoing change. It is based on the premise that infill interventions operate in dialogue with architectural history and the cultural landscape, contributing to broader environmental and urban strategies.

Structured into theoretical and analytical sections, the paper explores the complex relationship between architectural practice and inherited contexts and demonstrates that even individual infill projects can inform sustainable urban development and future architectural strategies.

The theoretical section focuses on the complexity of the dialogue that architecture establishes with its environment, including:

- A concise, evolutionary overview of the complex relationship between architectural practice and theory in relation to inherited historical contexts.
- Comparative analysis of architectural strategies in understanding and valorizing the environment, emphasizing not only the shaping of space but also its interpretation for the user.

The analytical part focuses on three residential projects in semi-urban contexts in Germany, selected for their thematic relevance rather than geographic or historical specificity. These case studies illustrate efforts to harmonize new structures with their surroundings, address site-specific characteristics, and promote both functional and comfortable living spaces.

The study highlights how cultural heritage can inspire transformation while supporting contemporary residential needs. The study further aims to show that even individual examples of residential architecture can represent opportunities for formative changes toward a sustainable future.

Table 1. Key Challenges and Impacts of Urban Infill (Table by Elša Turkušić Jurić and Haris Bradić)

Category	Description
Spatial Constraints	Available plots in urban areas are rare, often irregular in shape or surrounded by existing buildings, making infill complex.
Social Factors	Local communities may resist new developments due to perceived changes in neighbourhood character; urban identity and memory are essential for spatial continuity.
Legal and Ownership Aspects	Land may have multiple owners, unresolved legal status, or be subject to litigation, complicating implementation.
Infrastructure Limitations	Existing infrastructure (water, electricity, transport) is often not designed for the additional capacity that new developments bring.
Regulatory Frameworks	Urban planning regulations restrict design freedom—particularly in terms of height, volume, and typology.
Environmental and Energy Policies	Infill projects must respond to sustainability demands, including reduced emissions, renewable energy use, and environmental preservation.

Table 2. Qualitative Frameworks of Urban Infill (Table by Elša Turkušić Jurić and Haris Bradić)

Category	Description
Sensibility	Sensitivity, as a starting point, entails a profound understanding of the context — physical, social, and historical. It requires a careful reading of the setting, local memory, and the structural logic of the neighbourhood. From this understanding, creativity and innovation emerge, enabling the articulation of new content within the existing fabric in a manner that does not disrupt the established balance but rather enriches it.
Creativity	
Inovativenness	
Harmony	Ensuring that the new intervention does not appear as a foreign element within the space, but as a logical continuation with its own identity, while remaining respectful of the existing conditions. It is through this framework of qualities that successful examples of architectural infill can be understood and critically evaluated in practice.
Continuity	
Composition	

3. THE ROLE OF INFILL IN ARCHITECTURAL PRACTICE AND THEORY

The repurposing of urban land has always been, and will continue to be, an integral aspect of the physiological evolution of built environments, as each parcel is constantly subjected to multiple pressures. These pressures arise from economic dynamics, demographic shifts, emerging technologies, rezoning, and other social and environmental factors [4, pp. 7-9.].

The concept of urban infill is interpreted in both literature and practice through the notions of interpolation and integration. Interpolation is defined as the construction of new structures between two existing buildings or their insertion within an already largely built-up district [5, pp. 479-482]. Today, architectural interpolation is understood as any architectural intervention within an existing environment, whether built or natural [6, pp. 77-80], [7]. Integration refers to the process of transforming or combining individual parts into a coherent whole [5]. In architectural practice, the 'whole' that must be considered and valued to understand the meaning and role of the individual elements is defined as the context.

As one of the eight assessment criteria of the Davos Quality System, developed with the intention of evaluating the quality of Baukultur, context is described as a spatial coherence: "Planning and design involve a respectful dialogue between the existing local characteristics, architectural heritage, and contemporary creativity. In the best case, the latter should ensure spatial coherence between existing qualities and features in landscape, urban grain, typology, color, and material" [8], [9].

Italian architect Ernesto Rogers, working within the BBPR studio and writing on construction within existing environments, demonstrated that continuity of tradition need not be historical mimicry, but rather an allusion to context to the extent that historical conditions demand [10], [11]. He was among the first proponents of modern architecture to describe the term *preesistenze ambientali*, encompassing what is now understood as context—namely, the presence of the past within the present through 'pre-established contextual conditions' [12], [13]. Namely, Rogers emphasizes that considering the cultural context is linked to respecting historical continuity in architecture. As Kenneth Frampton continues later, the significance of cultural continuity lies in maintaining collective confidence and the progressive capacity of a society or community [14]. Thus, the ambivalent character of twentieth-century architecture is strongly marked by the continuous questioning of the degree and modality by which old and new can coexist as foundational elements of cultural

context, bridging the gap between traditional and modern architectural experiences as carriers of socio-cultural meaning [15]. The practice of interpolation enters architectural practice as awareness grows regarding the degradation of historic urban fabrics and monuments by new construction, which, due to technology, materials, or programmatic requirements, often struggles to engage in a respectful dialogue with its surroundings. This concern is underscored by the Venice Charter (1964), which established that a monument cannot be considered in isolation but must be valued in relation to its environment and all elements that define it spatially and culturally. Consequently, the task shifts from the individual object to the broader context. In line with this, the 1972 Budapest Declaration provides specific guidelines for interventions within historical settings, with the primary aim of respecting existing spatial relationships, avoiding imitation, and at the same time allowing freedom for creative expression and the introduction of new functions, without affecting the structural and aesthetic qualities.

Despite numerous international guidelines for interventions within historic environments, the process of interpolation remains highly complex, requiring skill and judgment. Each intervention sets a precedent for future action in space, simultaneously reflecting its era and expressing the values of the surrounding context [16]. Four methods of interpolation by Ivo Maroević may include facsimile reproduction or stylistic intervention, adaptation, emphasis, and contrast, each grounded in compositional principles and design elements in which visual integration is paramount [17, p. 389]. The most common elements through which spatial relationships are harmonized include volume, scale, form, colour, material, detail, and the memory of place [18, p. 71]. In their various forms and combinations, these can serve as integrative components in achieving the aesthetics of spatial unity [7], [19]. However, the mere skill of reading and recognizing elements of context, as well as the manner of their composition, does not guarantee the success of every new design. Architectural expression is often imposed on the surrounding context, or results in the creation of 'an image of an image.' Strategies for selecting a new design in historical pattern span a broad spectrum—from imitation to disregard—encompassing approaches such as replication, referential, neutral, abstract reference, and opposite [20]. This suggests that interpolation itself constitutes a complex process that necessitates the architect's creativity and sensitivity, while at the same time becoming an increasingly ubiquitous practice today in spatial and urban development, architectural critique, and education.

Limited attention has been given to the inner organization of buildings and its reflection on the totality of the existing environment. Regardless of the chosen method or design approach, it is essential to ensure that urban functions do not compromise the integrity of the environment, while also addressing internal spatial quality for user satisfaction and the harmonious integration of all elements [16].

Today, cultural heritage is increasingly regarded as part of the solution to mitigate the effects of climate change. Heritage is therefore not only an attempt to preserve the past but also a carrier of progressive ideas for a better future: it plays an active role in spatial transformation, serves as a catalyst for positive change, and acts as a link connecting people while strengthening their sense of belonging and social inclusion [21]. Cultural heritage and landscapes express a long-standing and intimate relationship between communities and places, including their natural settings [22]. These principles encourage research into elements that can inform architectural design practices.

A return to fundamental architectural elements—such as the sun's path, vistas, natural light, and respect for orientation—can significantly contribute to creating higher-quality and

more comfortable spaces, while simultaneously contextualizing the environment in a way that reflects the exterior within the interior [23, pp. 119-135], [24, pp. 195-199].

4. ARCHITECTURAL STRATEGIES FOR ENHANCING AWARENESS OF THE IMMEDIATE ENVIRONMENTAL CONTEXT

Materials and construction, architectural form, and site-specific elements are explored in this chapter as approaches most commonly encountered in processes of adaptation and interpolation. At first glance, the selected examples of buildings may not suggest obvious relationships. Yet this very ambiguity encourages a departure from dogmatism and established observational patterns. Instead, the aim is to demonstrate the breadth of architectural practice and reconsider potential alternative connections between works within the context of contemporary demands.

Over the past century, during the development of modern architecture, such challenges often occupied a peripheral position, particularly among architects eager to embrace innovative technological and structural solutions. Faith in technological progress frequently overshadowed the cultural context, with innovations primarily serving to create more comfortable and dignified habitats accessible to all.

The relationship between the 'modern' and the 'existing' is inherently ambivalent, as exemplified by the Tugendhat Villa in Brno, designed by Mies van der Rohe. The villa represents a departure not only from traditional forms and principles but also from the established traditional culture of living. The creation of continuous, flowing interior spaces stemmed from the owners' dissatisfaction—and that of the avant-garde individuals— with the prevailing culture of living that relied on fragmented rooms and corridors [25]. Large glass surfaces in the villa's public areas, opening onto a spacious garden, establish spatial unity, wherein interior and exterior coexist equally. The glass façade functions both as a boundary and a connector, providing inhabitants with an intensified awareness of nature and its transformations. Mies van der Rohe accepted the commission primarily due to his enthusiasm for the hilly site, which offers remarkable views of the cityscape and the castle [25]. The architect's emphasis on fluidity between exterior and interior can thus be interpreted as a deliberate effort to strengthen inhabitants' identification with the existing context and the changes occurring within it.

Bruno Zevi further reinforces this notion, defining architecture as the synergy between interior and exterior spaces [26]. This synergy can be achieved in diverse ways, as demonstrated by the Residence on Bjelave in Sarajevo (former Residence of the President of the Presidency of the Socialist Republic of Bosnia and Herzegovina, 1978), designed by Zlatko Ugljen. The building exhibits a dynamic volume with a pronounced sloping roof, fragmented massing, and an intimate spatial scale. Interpolated within a traditional residential zone of individual housing, the architect sought to preserve visual integrity and historical authenticity through the tactile qualities of the materials, while simultaneously expressing personal design language and contemporary sensibilities [27]. In this context, the architect draws on recognizable formal elements from the historical milieu and reinterprets them in a contemporary architectural language, carefully maintaining spatial scale.

The imperative to enhance the existing context arises not merely from aesthetic refinement but from the need to ensure continuity. This perspective is reflected in the amendment to the Planning Policy Guidance (Grummer's Law, paragraph 3.21) enacted in the late 1990s,

which "allows the building of a new country house in open countryside, provided it is of 'truly outstanding' design and 'would significantly enhance' its setting" [28]. Although initially met with professional skepticism regarding the potential proliferation of new classical architecture, the policy contributed to the preservation of cultural landscapes and the conservation of numerous historic buildings.

The emergence of new demands has often led to dogmatic tendencies in aesthetic directions. Contemporary society, increasingly apathetic toward nature, community, place, and history, faces additional challenges. Despite technological and mobile accessibility, little is understood about the creative process and the inherent challenges of any work or product. Modern material and construction technologies have enhanced interior comfort; however, this protection from external influences has also created inertia in response to climatic variations throughout the day and across seasons. Contemporary buildings, with increasingly demanding technical envelopes, often isolate us from the broader environment and nature [29].

Architect Toyo Ito reflects on this alienation, emphasizing the disheartening effect of the 'machine for living': "Cosily tucked away in the comfort of our homes, we lose our awareness of the external space surrounding us; we do not react to nature, to climatic and daily changes—our senses are not stimulated or developed. A well-insulated house primarily provides comfort, but the end result is that people become detached from their environment and cease to perceive it through their senses" [30].

Tama Art Library in Tokyo, designed by Toyo Ito, exemplifies an alternative approach. Through simplicity and rigorous rhythm, the building generates an atmosphere of monumental elegance while simultaneously dissolving the boundary between interior and exterior. The heightened awareness of nature and daily (climatic) variations, along with shifting perceptions experienced while moving through the building, is further intensified by a floor that follows the terrain's slope. This element of movement constitutes a central aspect of the architectural strategy for contextualizing the building within its everyday use.

5. CASE STUDIES: INTERPOLATION IN THE SEMI-URBAN CONTEXTS OF GERMANY

The analysed projects—multi-unit residential buildings (for rent or sale) commissioned by private investors—are situated in Germany, within towns of predominantly semi-urban character. These settlements, distinguished by a strong tradition of local building culture and a consistent spatial form, are currently undergoing partial transformations—most notably increased density and the reconfiguration of existing plots into residential complexes. The specific conditions of each of the three locations generated comparable architectural responses—interpolations that, through adaptive methods, established a dialogue with the surrounding context (Figure 1), (Figure 2).

Taken together, these examples also demonstrate how programmatic requirements and contextual parallels—despite the involvement of different stakeholders—may be aligned with broader strategies aimed at advancing health and well-being, in accordance with the United Nations Sustainable Development Goals [31, pp. 33-34]. Each project engages site-specific characteristics as a resource for ensuring healthy living environments, while simultaneously safeguarding cultural heritage and promoting decent housing.

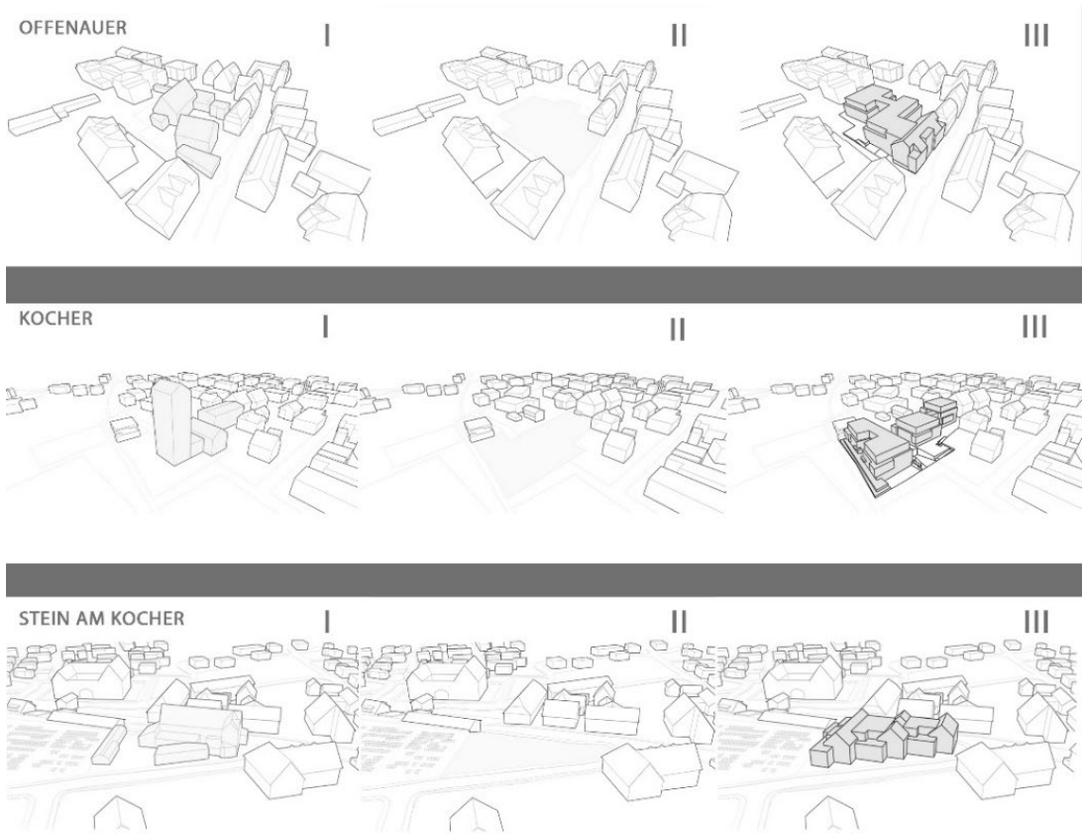

Figure 1: Volumetric representations of all three locations, illustrating the transformation from the existing condition to the newly introduced structures [32]

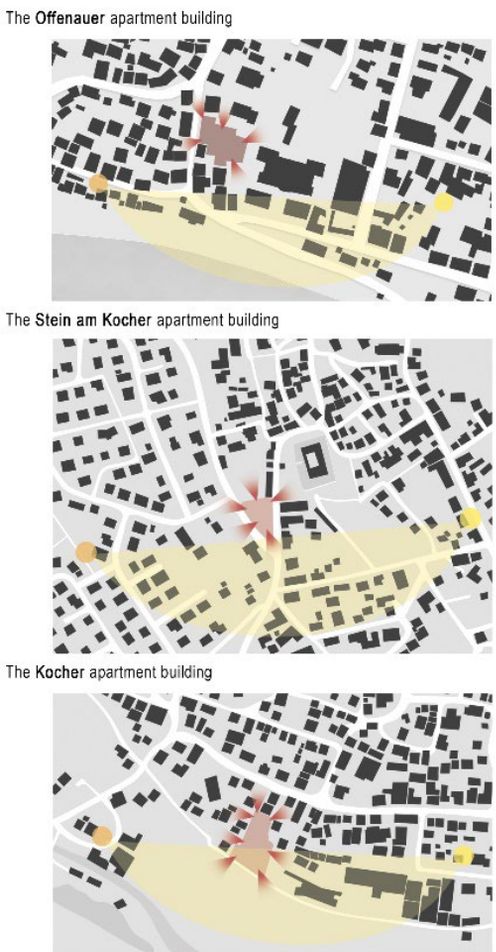

Figure 2: Optimizing views and daylight within the limitations of site boundaries (Figure by Haris Bradić)

5.1. THE OFFENAUER APARTMENT BUILDING: NATURAL LIGHT AND VISTAS

The Offenauer Residential Building has been interpolated into the urban fabric of the town of Bad Friedrichshall, located in the federal state of Baden-Württemberg, with a population of approximately 18,800 inhabitants. The plot is situated near the Kocher River and lies longitudinally along the east–west axis. It has a rectangular shape, with vehicular access from Offenauer Street to the west, and a retirement home with pedestrian access located to the east (Figure 3).

The existing urban matrix consists of individual residential buildings characterised by cubic volumes and gabled roofs, often featuring hipped ends (*Krüppelwalmdach*). In response to this context, the archetypal house form was adopted as the basic module and unit of measurement in the design of the new building, with the aim of preserving spatial cohesion and environmental continuity.

Figure 3: Street View along Offenauer Street with Old and New Structures [32]

Figure 4: Aerial View of the New Residential Complex [32]

The volume of the interpolated building is articulated through a gradual inward meandering along the plot, resulting in a dynamic form shaped by the repetition of a single spatial unit. The functional organisation of the building is structured around three main components, connected by "joints"—shared entrances and circulation areas—and separated by green courtyard spaces. Two of the internal cubic volumes are topped with flat roofs, contributing to the clarity and composure of the overall spatial composition (Figure 4).

The street-facing façade maintains the rhythm and height alignment of neighbouring buildings, thereby respecting the street's morphology and visual harmony. The façade composition is defined by a horizontal rhythm of openings, loggias, and balconies, along with a polychromatic surface treatment, all of which reinforce the architectural coherence of the structure. All these compositional principles, in correlation with functional aspects, have led to the creation of a playful layout disposition:

- User circulation – implemented through a clearly defined network of connections linking the three volumes into a cohesive whole;
- Plot coverage ratio – aligned with planning constraints while ensuring optimal daylight penetration into interior spaces, in accordance with sunlight exposure standards;
- Interior spatial quality or inner atmosphere – achieved by orienting rooms towards external vistas and employing architectural elements such as corner loggias, corner windows, open floor plans, and a corridor-based sequence of rooms.

The building emerges as a synthesis of architectural elements, seamlessly integrated with the built and natural environment, providing residents with an enriched daily experience shaped by abundant natural light and visual coherence (Figure 5), (Table 3).

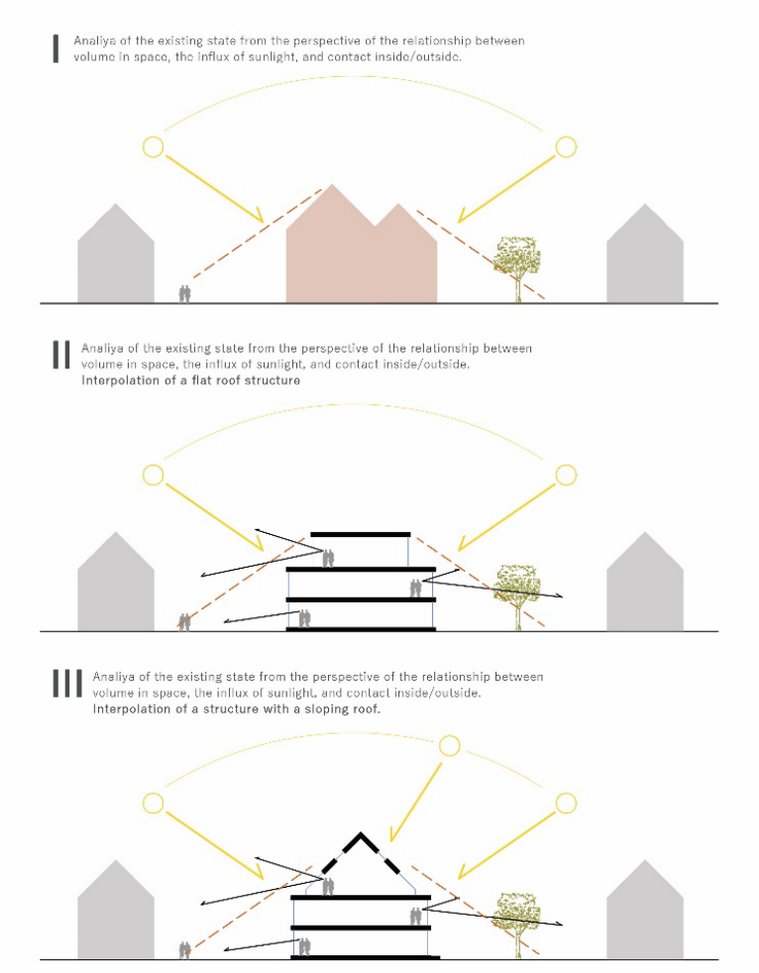

Figure 5: Shaping the new structure in accordance with contextual influences (Figure by Haris Bradić)

Table 3. Analytical framework of initial and derived parameters in the infill design of the Offenauer Apartment Building (Table by Elša Turkušić Jurić and Haris Bradić)

Environmental context	Composition principles	Architectural elements: exterior or Visual integration	Architectural elements: interior or Inner atmosphere
Fragmented urban fabric	Coherence	Height alignment of the street – urban composition	Sufficient natural lighting
Traditional architecture element: gabled roof	Fragmentation	Two roof types: pitched and flat	Favourable and dominant vistas
House archetype module	Rhythm	Repetition: shapes, openings, materials	Program and functional scheme
Plot repurposing	Meandering		

5.2. THE STEIN AM KOCHER APARTMENT BUILDING: THE HOUSE CHARACTER AS A UNITY OF INTERIOR AND EXTERIOR

The second project analyzed is situated in Stein am Kocher, Baden-Württemberg, a town of approximately 2,500 inhabitants. The site occupies a central position at the intersection of Lobenbacherstraße and Kurmainzstraße. The plot is irregular and triangular, bounded by roads on two sides and the town cemetery on the third, with a clear north–south orientation.

This project marks the first collective housing intervention in an area largely defined by single-family homes. While the development received support from both the municipal authorities and a private investor, the local community expressed cautious resistance. These contrasting positions informed the design strategy, requiring careful attention to both the physical context and social sensitivities by preserving the character of individual housing through the scale and repetition of its traditional elements. Elongated volumes with gabled roofs—typical in the area and reminiscent of the nearby historic castle—provided a modular framework for the new form.

The gabled volumes, interpreted in a minimalist manner, are arranged along the plot's longer edge, responding to its triangular geometry. They are connected by lower, flat-roofed elements, creating a rhythmically spaced sequence of units. This approach reduces the perceived scale of the building, rendering it less visually dominant. The horizontal composition is further reinforced by alternating patterns of balconies, materials, and window openings. Fragmentation of the overall mass is achieved through variations in color, scale, geometry, and the positioning of openings (Figure 6).

Figure 6: *Kurmainzstraße street view of the complex [32]*

Figure 7: Corner view of the complex [32]

Openings play a key role in defining the interior spatial atmosphere, creating visual connections with the exterior, and seamlessly integrating the surrounding landscape into the indoor experience. Glazed surfaces within the rooms account for 32% to 70% of the façades, posing challenges for solar control and energy efficiency [33]. These transparent planes not only provide abundant natural light but also foster a meaningful emotional connection between users and their environment (Figure 7).

The apartment layouts do not rigidly follow the rhythm of the exterior volumes; rather, they are distributed evenly across the building blocks to optimize functionality. At the same time, the design meets the investor's specifications regarding the number and size of housing units. A notable feature is the inclusion of an atrium—a green, shared space within one of the blocks—accessible to three residential units, enhancing communal interaction and spatial quality.

Overall, the residential complex is carefully interpolated into its traditional context, respecting the surrounding urban and architectural values while accommodating the requirements of contemporary living (Figure 8) (Table 4).

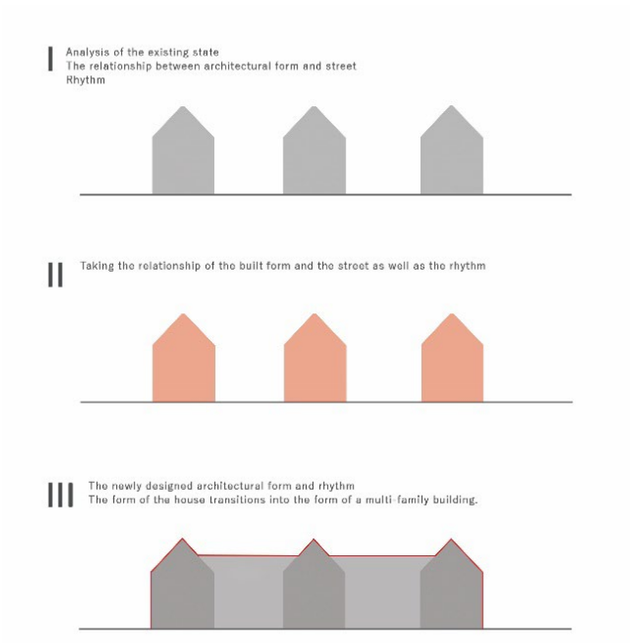

Figure 8: Achieving harmony and balance in dialogue with the architectural elements of the context (Figure by Haris Bradic)

Table 4. Analytical framework of initial and derived parameters in the infill design of the Apartment Building in Stein am Kocher (Table by Elša Turkušić Jurić and Haris Bradić)

Environmental context	Composition principles	Architectural elements: exterior or Visual integration	Architectural elements: interior or Inner atmosphere
Fragmented urban fabric	Linearity	Variety and multiplicity of openings and materials	Sufficient natural lighting
Traditional architecture element: gabled roof	Dynamism	Two roof types: pitched and flat	Favourable and dominant vistas
Local community identity	Rhythm	Articulated floor plans with a small atrium	Transparency
	Module: house archetype		

5.3. THE KOCHER APARTMENT BUILDING: LANDSCAPE BECOMES INTERIOR

A residential complex of two volumes with shared courtyards was designed in Kochersteinsfeld, a town of approximately 2,000 inhabitants. For the first time in the settlement's urban history, a collective housing development was planned on a plot along the Kocher River's green belt (Figure 9). Previously used for industrial purposes, the site received approval from the local community for transformation into a residential zone. The surrounding urban context features three-storey urban villas, typically with pitched or gabled roofs, dormers, and multi-gabled forms, while flat roofs appear only sporadically.

The settlement's spatial fabric exhibits a calm, continuous rhythm of cubic volumes, with noticeable fragmentation and irregularity shaped by winding streets.

Figure 9: Panoramic view of the settlement from the river [32]

The residential complex with a green courtyard was embedded in the urban and green surroundings. Through a mix of materials, cantilevered elements, and the interplay of solid and void, light and shadow, an intentionally irregular vertical and horizontal rhythm was achieved. These strategies created a balanced spatial composition and reinforced architectural coherence. The design followed a three-step methodology: the above-ground mass was first divided into two main segments; these were then further fragmented to enhance façade articulation and optimize the floor plan; finally, bay windows and volumetric projections animated the façades, generating dynamic shadows and enhancing the building's plasticity. The façades combine subtly textured white plaster with light beige clinker brick, creating contrast and depth (Figure 10).

Figure 10: The dynamically composed façade [32]

The primary goal was to evoke the character of individual housing while keeping the Kocher River and its green corridor as the dominant visual reference from nearly every apartment. The ratio of transparent to opaque surfaces on the southern, eastern, and western façades was heavily skewed toward glass. Each resident can control the transparency of the glazed panels, modulating the connection between interior spaces and the natural environment (Table 5).

Table 5. Analytical framework of initial and derived parameters in the infill design of Kocher Apartment Building (Table by Elša Turkušić Jurić and Haris Bradić)

Environmental context	Composition principles	Architectural elements: exterior or Visual integration	Architectural elements: interior or Inner atmosphere
Fragmented urban fabric	Fragmentation	Variety of openings and materials	Framed vistas
Traditional architecture element: pitched roof	Dynamism	Interplay of solid and void	Interior openness
Proximity to the river and nature	Irregular rhythm	Shared courtyards	Transparency
Plot repurposing			

6. CONCLUSION

The process of interpolation within the built environment is complex and demanding, yet indispensable in shaping a sustainable society and environment. Methodological guidelines derived from past practices and experiences of modern societal development and intensive urbanization represent only a foundation—one that must be continuously re-examined and revalorized in light of contemporary challenges. Within these challenges, both the role of heritage and the practice of architecture itself are undergoing a transformation. Such revalorization should emerge from the discipline in its entirety, grounded in its critical and innovative lessons, thereby enhancing awareness of questioning the character of place. Architectural achievements of this kind suggest the active contribution of architecture to the understanding and valorization of the environment, demonstrating that interventions do not merely shape space but also interpret it for the user.

Harmony, continuity, and composition—the fundamental tools of architectural infill—require new interpretations and evaluations in the context of climate change and contemporary lifestyles. This underscores the importance of sensitivity, creativity, and innovation, expressed not only in relation to cultural heritage but also to the living and natural environment as a whole. It becomes essential to consider how these elements, in their interplay, shape the quality of everyday life, where spatial perception emerges from experience, socialization, and interaction.

The three analyzed residential buildings illustrate this point: through the combination of carefully articulated aesthetics, recognizable traditional elements, and a fluid dialogue between interior and exterior, they embody a clear sense of home (Figure 9). These

examples demonstrate that new architectural interventions, while respecting the spatial parameters of their context, must simultaneously orient design toward fundamental environmental factors—sunlight, vistas, and natural airflow—in order to enhance sustainability, well-being, and spatial quality. They also reveal how meaningful work can be done both in the interior and the exterior, with equal importance (Figure 8) (Figure 10). Such processes nurture human perception, imagination, creativity, empathy, and emotional responsiveness—capacities increasingly neglected in a world dominated by superficial visual culture [34, p. 15]. This raises a pressing question: how can we meaningfully understand the world, nature, and the transformations of our surroundings if we lose the ability to perceive and interpret them?

By employing these fundamental elements, design can offer more sustainable and meaningful solutions than conventional technological approaches that rely heavily on energy and resource consumption. One focal point of the New European Bauhaus is the design and aesthetics of Europe's future living environments, aiming to strengthen the sustainability of the design process. Heritage and landscape must be recognized as integral components of this process, incorporated through methodical interpolation strategies.

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СЛОЖЕНОСТ УРБАНЕ ИНТЕРПОЛАЦИЈЕ: СТУДИЈЕ СЛУЧАЈА ТРИ СТАМБЕНЕ ЗГРАДЕ

Сажетак: Процес урбане интерполације, поступак изградње унутар изграђеног окружења, представља фундаментални и све значајнији приступ ка одрживом друштвеном, просторном и еколошком развоју. Иако се заснива на искуствима и праксама модерне урбанизације и ревитализације, његови методолошки оквири морају се континуирано преиспитати и прилагођавати у контексту климатских промена и савремених облика живота. У том смислу, преиспитивање архитектонског наслеђа и професионалне праксе постаје кључно, како би осетљивост, креативност и иновативност остали у центру пројектанстких стратегија. Рад разматра савремене приступе интеграцији нових структура у постојеће изграђено ткиво, полазећи од става да њихова интеграција не треба да произилази само из естетске хармоније са свеукупним окружењем, већ и из динамичног односа између унутрашњег и спољашњег простора, који одражава обрасце свакодневног живота и временске промене у окружењу. Фокусирајући се на три стамбена пројекта у мањим урбаним срединама, студија примењује методолошки оквир заснован на анализи амбијенталних услова, принципа обликовања и просторних решења. Добијени резултати показују да урбана интерполација може истовремено сачувати карактер локалне заједнице, омогућити идетификацију са хабитусом, те одговорити на савремене функционалне и еколошке захтеве.

Кључне ријечи: становање, интерполација , животна средина, наслеђе, одрживост