

Affordances of Architectural Typology

Andreas Lechner¹[0000-0001-9064-5766], Gennaro Postiglione²[0000-0003-4886-4548], Maïke Gold¹[0009-0008-0575-6591]
Francesca Serrazanetti²[0000-0002-9324-8309]

¹Graz University of Technology, Graz, Austria

²Politecnico di Milano-DASTU, Milan, Italy

ABSTRACT:

“Affordances of Architectural Typology” is a concept for design-driven research that explores and advances sustainable design strategies aimed at resilient building structures but are inherently architectural in nature. As material compositions, buildings mediate between forms and functions across different timescales. Considering the “shearing layers” of a building, the primary structural system can last for hundreds of years, while non-bearing walls, surfaces, furnishings, and specific uses are more temporary. This temporal disparity creates a gap that architects bridge “designerly”—using techniques of abstraction to envision past and future forms of inhabitation and alteration, revealing the building’s fundamental character, or type. A resilient structure aligns closely with its type, a formal structure or organizational notion that imparts a recognizable order upon architectural elements. This alignment is evident in historical buildings where load-bearing elements, building volume, and rooms structurally overlap, allowing for centuries of diverse uses and adaptations. However, with modern, energy-intensive building technologies and the separation of the building envelope, this alignment becomes rare. Thus, transforming modern structures convincingly requires greater interpretation and self-determination in design.

This paper examines the affordances of architectural typologies in two directions, reflecting the authors’ expertise. First, affordances are viewed as extensions to the notion of type in architecture, illustrated with reuse projects demonstrating that beyond meeting specific functional requirements, aiming for typological clarity is key to re-establishing architectural quality and providing flexibility for future transformations. Second, for an innovative approach in resilient architectural design, there is a need to update the post-functionalist critique around the notion of ‘type’ as an epistemology of the architectural discipline. This renewal involves reusing and recycling both the knowledge and the materiality of buildings. Understanding and leveraging architectural typologies can lead to more sustainable and adaptable design practices by embracing the inherent flexibility within the temporal layers of buildings. Architects can create structures that honour their historical significance while being capable of accommodating future needs by respecting typological essence and innovating within its framework to foster resilient architecture that is both timeless and adaptable.

KEYWORDS: Architecture, Typology, Affordance, Adaptive Reuse, Resiliency

INTRODUCTION: BEYOND ADAPTIVE REUSE

In the past two decades, adaptive reuse—the practice of saving and transforming existing buildings—has gained significant prominence and evolved into a distinct field of study and practice, separate from traditional building conservation. This evolution is evident in both practical projects and scholarly research. The architectural spectrum, from renowned architects to community-driven initiatives, now embraces adaptive reuse as a thriving and varied practice. Its associated aesthetics have gained popularity among clients and the public, attracting increased attention from architectural and conservation communities. Adaptive reuse addresses urgent urban challenges, cultural preservation, and economic considerations related to the growing and diverse stock of redundant buildings. Policy support for adaptive reuse has expanded beyond heritage protection, with entities like the European Union incorporating it into their agendas. The global push for carbon reduction, driven by the climate emergency, has further propelled adaptive reuse as a preferred strategy over demolition and replacement. Consequently, architectural education has begun integrating adaptive reuse into its curriculum, and the discourse on the subject has become mainstream and relevant. Authors writing on adaptive reuse in the past decade emphasize its crucial role in responding to contemporary challenges. The cultural attitude of “Reduce, Reuse, Recycle” aligns with the ethos of the twenty-first century, where everything is valued for its usefulness, purpose, and authenticity. This mindset has fueled a growing body of literature on adaptive reuse, reflecting its increasing importance. Notable works include those by Stone (2020), Plevoets and Van Cleempoel (2019), Wong (2016), Robiglio (2017), Schmidt and Austin (2016), Jaeger (2010), and Scott (2008). Important nodes in the formation and establishment of an international network of researchers and practitioners are indicated by events such as the recent international colloquium “As Found” by Hasselt University and the Flanders Architecture Institute at Antwerp’s De Singel. Additionally, the annual peer-reviewed publication Trace – Notes on Adaptive Reuse by the research group Trace at the same university highlights ongoing efforts to consolidate and expand this network. Overall, the rise of adaptive reuse reflects a broader cultural shift towards sustainability and the valuing of existing resources. It underscores a growing recognition of the potential to creatively and responsibly adapt the built environment to meet contemporary needs while preserving historical and cultural significance.

Conceptually, interpretations of adaptive reuse vary significantly due to the diverse disciplinary backgrounds, traditions, and agendas of different authors. Some view adaptive reuse as a broad practice within architectural design, while others consider it a specific practice within interior architecture. The ongoing debate seeks to clarify terminology and definitions, but the multitude of terms and interpretations hinders the establishment of a shared foundation for discussion. The relationship between the old and the new remains a central theme, often discussed as a moment of disjunction between form and function. However, there is no conclusive definition of adaptive reuse, as the duality between old and new may exceed obvious material, functional, or cultural oppositions (Lanz and Pendlebury 2022, 255). In response to these complexities, the authors' research project "Affordances of Architectural Typology" proposes a processual approach focused on the design of the "unaltered". This research explores the central tenets of balancing design work to create a future-proof and enabling background of non-design or typological design—i.e., identifying the affordances resulting from a building's type. This approach can sometimes lead to a consistent transformation of the existing fabric, aiming to improve its "typological" quality. By advocating for a fundamental and specific architectural design expertise, the project underscores the importance of securing the resiliency of buildings through a deeper understanding of their typological characteristics. This method emphasizes the value of a building's inherent qualities and aims to leverage them for sustainable and adaptive transformations, ensuring that structures remain relevant and functional in the face of changing needs and conditions.

1.0 ARCHITECTURAL TYPOLOGY

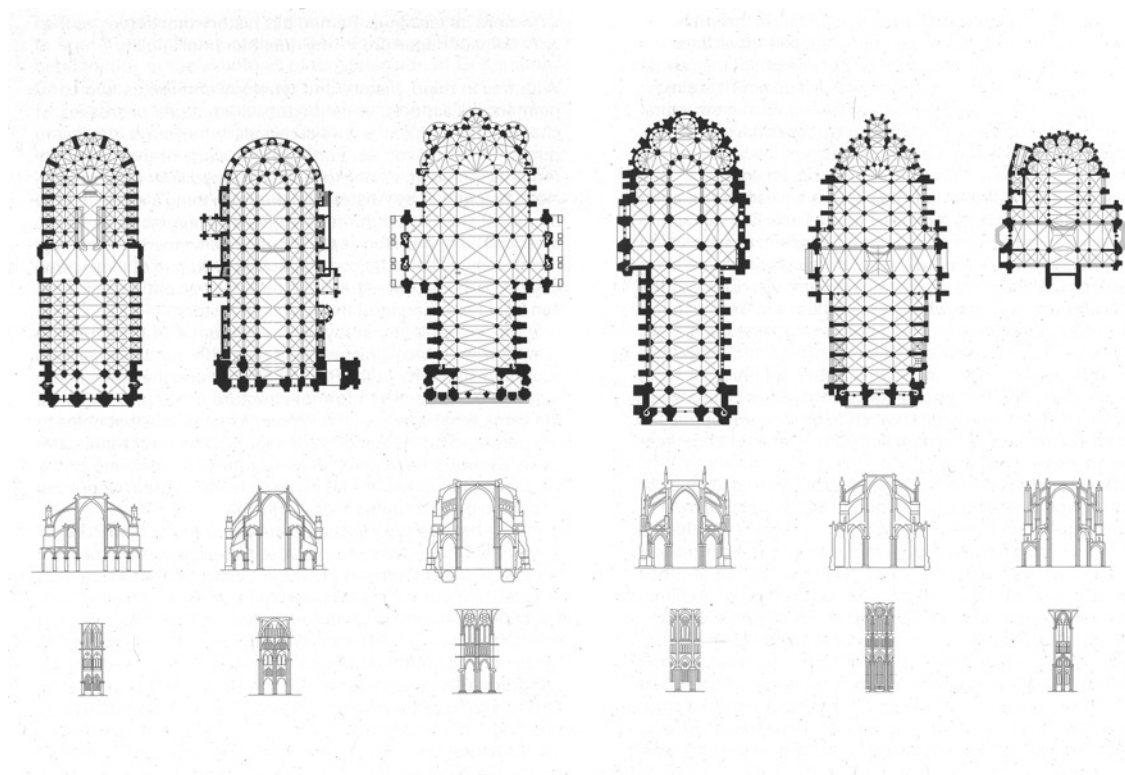


Figure 1: The Great French Gothic cathedrals of the 12th and early 13th century: Paris, Bourges, Chartres, Reims, Amiens and Beauvais. Plans, sections and details. Source: (Martí Aris 2021)

The inconclusiveness of the literature and theory review on adaptive reuse can be compared, with a grain of salt, to the discussions of typology in architecture. The myriad anecdotal cases of adaptive reuse projects resist simple categorization into a neat, undisputed system of types. This issue echoes the question of typology and the nature of architectural work, as explored by the Spanish architect Rafael Moneo in his seminal essay "On Typology" (Moneo 1977). For Moneo, each generation of architects must use 'typology' to redefine the nature of architecture and its problems. Typologies, as direct indices of politics, help us understand how even the most mundane aspects of architecture—such as the disposition of primary structures and spatial elements—both determine a subject's experience of space and form the basis for the identification and affordances of given structures. Beyond the pragmatic aspects of repurposing buildings, identifying these affordances as cultural and historical dimensions of the urban environment—and as a repository of architectural form that emphasizes continuity—is one of the central tenets of Aldo Rossi's understanding of type (Rossi 1984). This perspective discredited naïve post-war functionalism and recognized the significance of architectural artifacts in conveying the collective memory of a city. It established the notion that buildings and urban elements are part of a larger urban fabric, not isolated entities. Architectural forms are rooted in historical and cultural contexts, serving as carriers of meaning and collective identity, whether they be buildings, streets, or public spaces. Drawing on these and La Tendenza's theories, Carlos Martí Aris views type as a condensation of historical experience and codified knowledge without questioning continuous and creative development (Martí Aris 2021). For him, type in architecture presupposes a degree of abstraction that modern thought provides. His thesis that architecture is based on general principles and archetypal forms sees type as an

organizing principle that structures elements through specific relationships. These relationships emphasize the importance of precise architectural terminology and the ability to describe architecture accurately. To further architectural knowledge, it must be viable for description and communication, allowing it to be shared and extended. Typological analysis involves researching and explaining structural similarities that, except perhaps for housing, are not necessarily tied to conventional uses. Thus, observation and comparison are central to typological analysis and to advancing architectural knowledge. Martí Arís distinguishes this typological understanding of structure from semiotic structuralism by showing how types function as elementary architectural structures. He emphasizes that the constant transformation of architecture results from continuous societal change and its *longue durée*. While identifying typological foundations in modern architecture is challenging compared to the monolithic character of traditional architecture, Martí Arís' conviction remains relevant. He argues that type has not lost its operative capacity in contemporary architecture but should be considered a fundamental condition for actions with outcomes that are not predetermined.

To achieve the important and necessary Vitruvian tenets of sustainability, adaptability, and aesthetic delight—an urgency also expressed by the New European Bauhaus initiative, launched by the European Commission in 2020 to connect the European Green Deal to the desirable quality, sustainability, and inclusiveness of our living spaces—we must rigorously study and teach the ability to assess a building's quality. Enhancing the quality of architecture requires understanding how buildings succeed or fail in terms of sustainability, adaptability, and aesthetic appeal. Despite superficial similarities among buildings, their longevity, flexibility, and careful design vary greatly. The typological analysis proposed here is a comprehensive evaluation of a design's spatial characteristics or a building's physical evidence through thorough architectural analysis. Reflecting the structural context of an existing building, this approach updates and clarifies the role of type today, addressing the responsibility of developing future-proof design solutions for an uncertain future.

2.0 AFFORDANCES

Cross-reading typology with cognitive psychologist James J. Gibson's concept of affordances aims to clarify these design potentials. Affordances respond, on one hand, to the ecological and pedagogical imperative of bringing building adaptation more prominently into the design studio. On the other hand, the concept of affordances helps to define and sharpen an important update of architectural expertise. As Gibson explains, "An affordance cuts across the dichotomy of subjective-objective and helps us to understand its inadequacy. It is equally a fact of the environment and a fact of behavior. It is both physical and psychical, yet neither. An affordance points both ways, to the environment and to the observer" (Gibson 1979, 129). This novel perspective on the relationship between the built environment and human perception describes potential actions that the environment enables or affords to an individual, much like being tasked with adapting, renewing, or extending recurring structures. The concept of affordances seeks to understand how people interact with and experience spaces, furniture, or spatial elements and installations. In architecture, affordances refer to inherent qualities of a space or structure that open up numerous possible uses or actions for its occupants, rather than focusing solely on the physical attributes of a building. Gibson's theory emphasizes the dynamic and reciprocal relationship between the environment and the individual, moving away from a purely formal or aesthetic analysis of architecture and exploring how the design of a space interacts with human behavior and perception.

Architectural affordances encompass a range of elements, including spatial configurations, material qualities, and the overall layout of a building, extending these elements to future possibilities. For example, a staircase affords climbing, a door affords opening, and a chair affords sitting. However, these primary affordances (namely, their functional programs) are not solely determined by the physical properties of the intentional objects but can be extended to other elements, such as stairs or window sills for sitting, or pergolas for sun protection and energy harvesting. Affordances are both designed and a matter of the perceptual and cognitive capabilities of the individuals interacting with them. Therefore, the design of a space becomes a language that intuitively communicates potential actions and behaviors to its users. Like Rossi's complex and reciprocal understanding of architecture and the city, Gibson's affordance theory challenges more traditional notions of architectural typology, which tend to categorize buildings based on reductive form-function relationships. Instead, affordances introduce a more dynamic and user-centered approach to understanding architectural potentialities, emphasizing the importance of context in shaping perception and behavior. A space's affordances are not universal but depend on the cultural, social, and individual factors that influence how people interpret and interact with their environment. This contextual sensitivity encourages architects to prioritize spatial qualities over simple functional programs in the design process, fostering a more inclusive and adaptable approach to architecture.

In conclusion, Gibson's concept of affordances impacts architecture theory and typology by shifting the focus from static forms to the dynamic relationship between the built environment and its users. The theory of affordances provides a framework for understanding how architectural elements communicate possibilities for action, influencing human behavior and experience. They extend the understanding of architectural types—constantly recurring structures like linear, radial, domed, reticulated, courtyards, or towers—as past and future building blocks that transcend temporal and geographic boundaries, constantly reused. What once challenged the modernist emphasis on universal principles and its rejection of historical precedents has today become the center of our rational and intuitive attention—the affordances of a building's material composition as a mediation between forms and functions across different timescales. This correlation of architectural typologies with affordances illustrates how a building adapts to or enables different uses and habitation over time. But how is access granted to this index? Is it exclusively through cartographic methods that we can develop this index further? Is it the descriptive combination of text and drawing that empowers us to analyze spatial characteristics and inform design and architectural construction?

3.0 AFFORDANCES OF ARCHITECTURAL TYPOLOGY: A CALL FOR PAPERS (BY DRAWING)

Understanding adaptive reuse solely as an architectural design intervention aimed at repurposing a building, limits its scope and overlooks its transformative agency. Shifting the focus from an oppositional duality between old and new—in terms of both materiality and function—towards viewing adaptive reuse as a process offers a more comprehensive and culturally complex approach. Spatial phenomena that “shift,” “translate,” or “occupy” hint at the negotiation of architectural form, an ambition that aims to transcend conventional product categories of the market economy.

With our Call for Papers—(Atlas of) Typology Affordances (Postiglione/Lechner 2023)—we were determined to explore the design process of transformation and adaptive reuse through plans, sections, and elevations of buildings, arguing that drawings are central to the forming and transforming, adjusting and reusing of our built environment. To read, write, and negotiate architectural qualities “designerly” means to penetrate and elucidate through qualities and drawing—its abstraction grants us the possibility of envisioning both past and future forms of inhabitation and alteration. It is through drawing that the more vague and unaltered character of a building can be revealed as its type. A resilient structure that seemingly coincides with the building type—as a formal structure or notion of organizing forms that confers a recognizable order upon architectural elements—is conceptualized as “Affordances of Architectural Typology.” This coincidence is evident in the strong footprint of historical buildings, where load-bearing elements, building volume, and rooms overlap structurally and allow, along with often generous dimensions, for centuries of different uses and adaptations.

Unpacking the inner character and quality of existing buildings is one of the central goals of the research project “Affordances of Architectural Typology,” which evolved from the cooperation of the authors with their respective design and research backgrounds in interior architecture and architecture typologies. The project works towards a publication in the atlas model with additional essays by members of the scientific board. An international call for papers collected projects in three categories—monuments, 19th-century institutions, and more generic or monofunctional 20th-century buildings—and uses an extensive drawing strategy developed by the authors to tell the story of their transformation, highlighting their typological character and resilience. All projects are reduced to the most significant floor plan, section, and elevation. These drawings are always vertically positioned on one single page. They are drawn in their initial phase (black), in the state of demolition and addition (yellow and red), and in the transformed or final stage (black) on separate pages, making the changes over time readable and comparable. Due to older accumulation—of time on the one hand and through physical manipulations on the other—convincing projects tend to feature more pages with transformations and will thus reveal their affordances through alterations of modern structures at the opposite end. This necessitates both more interpretation and more self-determination, as the cases in the third category will show. With this concept, we go beyond a simple recording of qualified building transformations (adaptive reuse) that occurred over time and aim at highlighting reuse interventions that clearly manifest a certain ‘typological approach’ as a design-driven focus. This is where our investigation distances itself more clearly from the adaptive reuse approach, shifting the interest from a design process generically engaged—though very qualified—with the pre-existing structure (and creatively open to multiple approaches) to one specifically focused on and engaged with its typological qualities (whether present or not).

To identify or unlock the “typological” character as a quality of an existing building or a building reuse beyond its functional and aesthetic dimensions, the key lies in the translation of spatial phenomena into architectural form. It is through mapping spatial relationships and related information—an operation that disrupts traditional architectural coherence—that the architectural process conceptualizes and integrates both time and place, exploring the embedded discontinuity within mapping (Schonderbeek 2022). Drawing enables the analytic, representational, and speculative use of the architectural process precisely because it suspends a building’s connection to time and space. This focus on mapping spatial information through architectural drawing involves creating a spatial ordering system within a map, positioning all ground floors, sections, and elevations vertically on a single sheet. We facilitate the development of a theoretical position in architecture by analytically comparing instances of adaptive reuse within a project. The conceptualization of order extends beyond formal analysis to include spatial disposition, taxonomy, organization, and program through an annotated history in footnotes and references that enable the reader to understand the project’s narrative both spatially and theoretically with considerable depth.

This extensive focus on mapping the process of alteration within adaptive reuse projects counters a recently published typology of adaptive reuse by an eminent scholar in the field (Wong 2023). This publication connects fifty seminal adaptive reuse projects to global changes related to energy, manufacturing, agriculture, transportation, religion, and new cultural heritage. This typological order, according to the original context of use, arranges the projects into six chapters where technical and social revolutions explain why certain architectural structures are subjected to reuse. Contrary to Wong’s typological atlas, we arrange the projects into three building categories related to their respective architectural types. In the first category, we gather buildings with a strong typological footprint, a spatial quality of monuments or palazzo types. The selected cases in this category show the minimal efforts necessary to harbor new uses. The resiliency and longevity of these buildings coincide with the affordances that the underlying type as a powerful typological footprint provides—sustainability through centuries of adaptive reuse. For example, we provide the complete history of Palazzo Gravina (1549–2023) in Naples, Italy, which was transformed from a private palazzo to a housing block, a public building, and finally to the school of architecture (Figure 2). This category is of extreme relevance to us because it manifests, with great evidence, the “affordances of architectural typology,” supporting our hypothesis that clear typological quality strongly impacts the resilience of buildings, going far beyond their original use and suggesting the central role of the building-type concept in a design-driven sustainable approach. Furthermore, when confronting buildings with a strong typological footprint, we

recorded how transformations occurred with minimal interventions, which considerably reduce their carbon footprint, further empowering the sustainable (and purely architectural) qualities of buildings in this category.

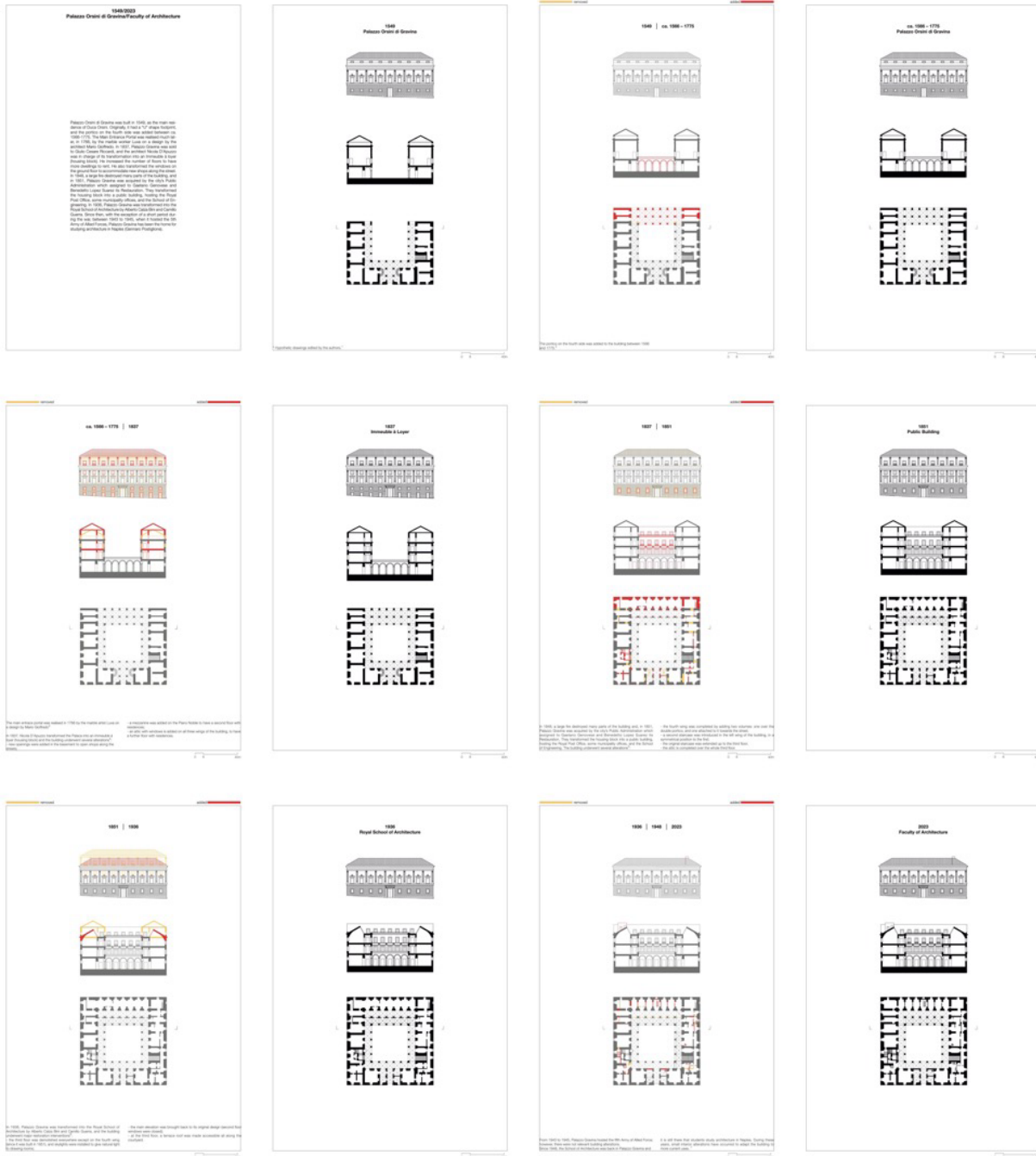


Figure 2: Palazzo Gravina (1549–2023) in Naples (Italy). Monuments, or ‘palazzo types’, are culturally significant and highly charged buildings that have undergone changes in use and occupation over time while maintaining or enhancing the typological integrity of the building. For example, the Palazzo Gravina in Naples was transformed from a private palazzo to a housing block, a public building, and finally to the school of architecture it is today. Source: (Gennaro Postiglione in Architectural Affordances 2024)

In the second category, we gather buildings with a weaker and/or unclarified spatial quality, primarily from the 19th century. The selected case studies demonstrate significant interventions that enhance and further the existing character of the building, promoting greater resilience through the reduction and clarification of architectural means to minimize the impact of potential future reuses. This category includes the conversions or adaptive reuses of former industrial, infrastructural, military, or health structures. In these cases, interventions change the use of the building but may also alter its typological integrity by adding or subtracting structure. For example, we present the Pousada de Viseu Hotel (1842–2023), formerly the Hospital de São Teotónio in Viseu, Portugal, by Gonçalo Byrne (Figure 3).

The main finding in this category is that transformations aim to fulfil the new functional program while simultaneously preserving and/or enhancing the building's typological quality, even through substantial architectural interventions. Such deep architectural adaptations impart a new resilience character to the buildings—what we have termed “typological affordances”—enabling them to face future repurposing with minimal transformations.

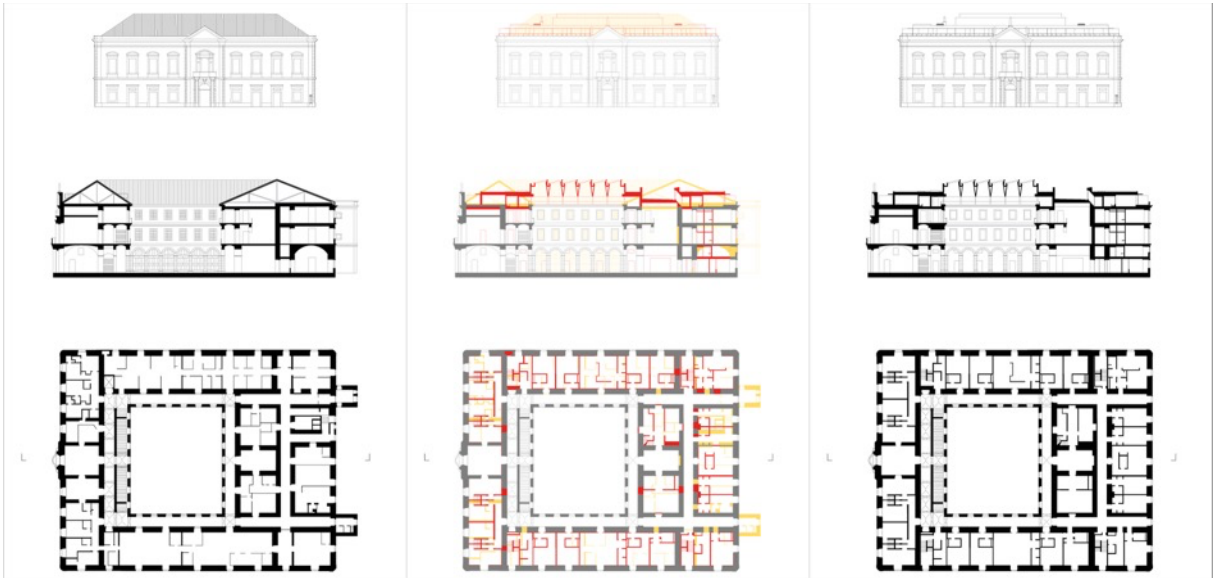


Figure 3: Pousada de Viseu Hotel (1842–2023) in Viseu (Portugal). Institutions, civic buildings, and public buildings, mainly from the 19th-century, are culturally significant structures based on classical compositions. These buildings have undergone significant interventions to improve and enhance their existing character, making them more resilient by reducing and clarifying the architectural means. The interventions alter the use of the building, but they may also affect its typological integrity by adding or removing structures. For instance, the Pousada de Viseu Hotel, formerly known as the Hospital de São Teotónio in Viseu by Gonçalo Byrne. Source: (António Carvalho in *Architectural Affordances* 2024)

In the third category, we gather case studies where the original spatial quality was nondescript, generic, or even absent—a characterization often found in many monofunctional buildings from the 20th century. Employing a typologically driven design approach, these adaptive reuse projects undergo extensive transformations to imbue them with a new spatial character. This character is typologically significant, illustrating the introduction of a fresh spatial quality that extends the building's lifespan through a new program integrated into its interiors. Within this category, our focus is on examples that initially lacked cultural significance, such as commercial, retail, office, and warehouse buildings. These structures have been transformed to incorporate new spatial qualities that introduce an unexpected level of generosity, facilitating convincing arguments for further adaptive reuse in the future. For instance, consider the ED.G.E. (1973–2022), a mixed-use multi-tenant complex in Milan, Italy, designed by Onsitestudio (Figure 4). The third category prominently demonstrates how reuse interventions guided by a specific typological approach as a design-driven focus can profoundly reshape the building footprint. Beyond merely providing new functionality, these interventions imbue the structure with resilience qualities—termed architectural affordances—achieved through deliberate architectural forms.

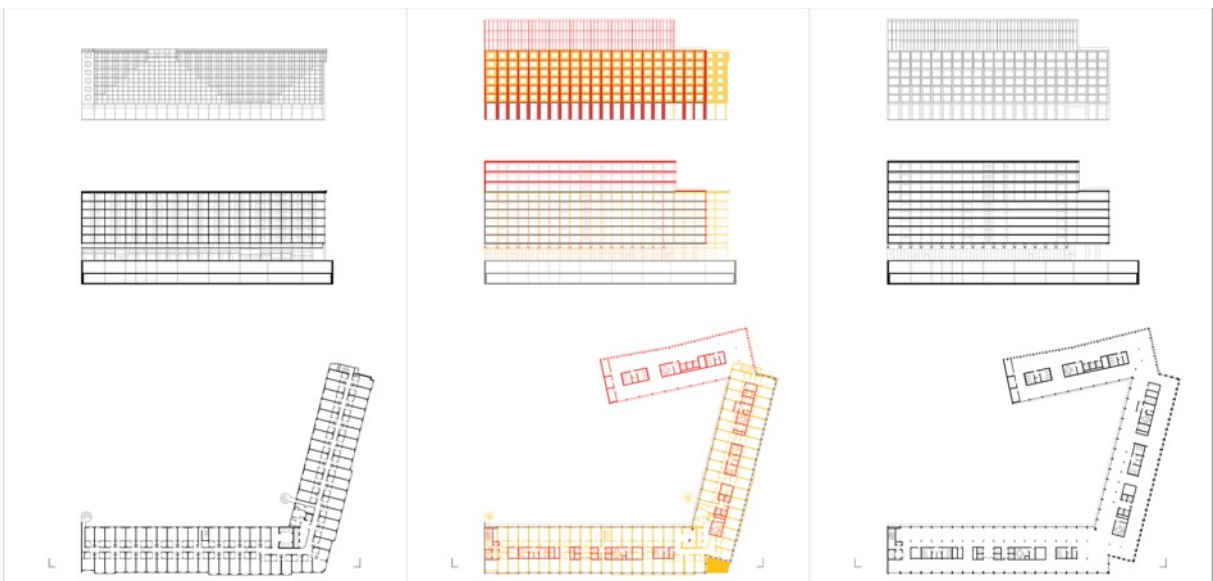


Figure 4: ED.G.E. (1973–2022) in Milan (Italy). The 20th-century monofunctional buildings were initially not culturally charged, but they managed to transform their generic character, which included commercial, retail, office, and warehouse buildings, into new spatial qualities. These qualities add a degree of generosity that was never intended. They now make a convincing case for even further changes in use. As an example, we provide the ED.G.E., a mixed-use multi-tenant complex and former Hotel Aerhotel (built in 1973) in Milan, by Onsitestudio. Source: (Angelo Lunati and Giancarlo Floridi in *Architectural Affordances* 2024)

CONCLUSION: RESILIENCE BY TYPOLOGICAL CLARITY

The core aim of the Affordances of Architectural Typology project is to elucidate, through an extensive examination of building transformations, two pivotal insights that underscore the nuanced and sometimes conflicting nature inherent in architectural design. Firstly, the project emphasizes that achieving typological clarity extends beyond mere fulfilment of functional necessities. It posits that such clarity is essential for advancing architectural excellence, while simultaneously allowing flexibility for future adaptations. In essence, the pursuit of architectural typological quality necessitates not only adapting structures to current needs, but also fostering a design approach that anticipates and accommodates evolving future functionalities and uses. These seemingly contradictory imperatives are central to our endeavour to enhance building quality, demanding a nuanced understanding of when and how architectural knowledge should be applied to cultivate appropriateness and excellence. Ultimately, this paradigm shift is crucial for fostering a built environment that aligns with the diverse needs and aspirations of contemporary society. Secondly, the atlas and the accompanying essays advocate for an innovative paradigm in understanding and designing resilience in architecture. It argues that revisiting and updating the post-functionalist critique of typology as an epistemological foundation in architectural discourse is crucial for evaluating building quality comprehensively. Enhancing architectural quality requires a deep understanding of how buildings succeed or fail in terms of sustainability, adaptability, and aesthetic appeal. Despite superficial similarities among buildings, their longevity, flexibility, and meticulous design can vary significantly. A thorough evaluation and comprehension of buildings involve scrutinizing rhetorical strategies and descriptions used to bridge the gap between physical presence and socio-cultural representation. Building analysis and typological research can be exhaustive, yet selectively focused on critical junctures where significant revelations provide a comprehensive understanding of the entire structure.

Considering a building's shearing layers, the primary structural system can endure for centuries, while non-load-bearing walls, surfaces, furnishings, etc., are more transient in nature (Brand, 1994). The differing rates at which components of a structure evolve over time influence its affordances. Therefore, designing resilient and adaptable systems hinges on recognizing and accommodating these varying rates of change. Clarifying the core structure and services of a building from a typological perspective facilitates easier adaptation to shifting needs without necessitating extensive overhauls (see Figures 5 and 6). Conversely, elements such as interior spatial planning and decor can be modified more readily and frequently to meet evolving requirements or preferences. The concept that a building, or any complex system, can be divided into layers with distinct rates of change and adaptability significantly enhances potential affordances (Van Ellen 2023). The expansive nature of affordances contrasts sharply with ergonomic or behavioral design studies and approaches, vividly demonstrating how adaptive reuse in architecture intricately intertwines with design evolution over time.

Architecture's efficacy is crucial in offering and realizing these affordances, shaping designs that endure while accommodating a diverse range of functions and uses, ultimately achieving a form of "spatial resilience." This design principle embraces sustainable and efficient utilization of built environments, revitalizing structures that may have become obsolete or underutilized. Sustainability emerges as a primary driver of adaptive reuse, as architects contribute to reducing construction-related waste and conserving resources by repurposing existing buildings. This approach resonates with contemporary environmental awareness, minimizing the ecological footprint associated with traditional construction practices. However, the cultural responsibility of architecture extends beyond physical transformations and functional fulfilment in adaptive reuse contexts, striving always to achieve a harmonious relationship between typology and urban form.

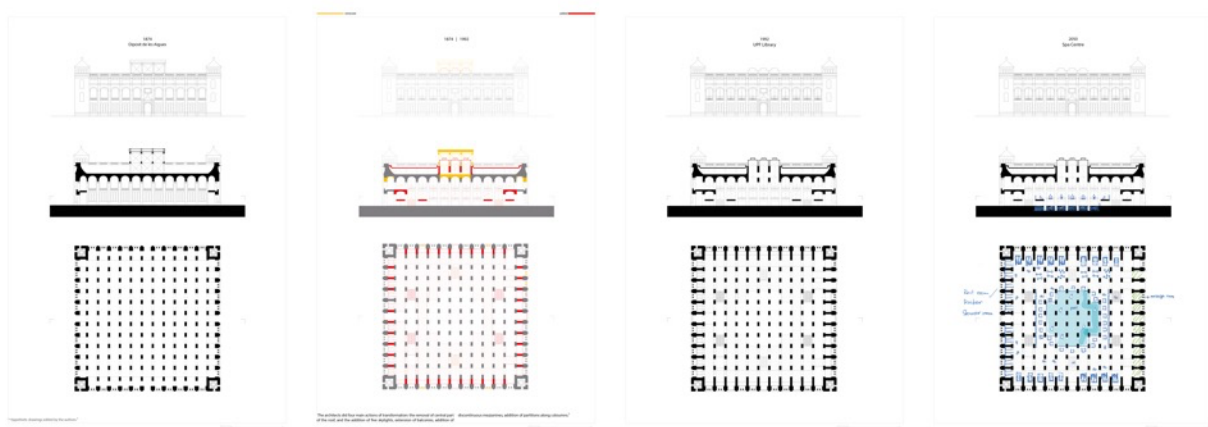


Figure 5: UPF Library (1874–1992/2050) in Barcelona (Spain). In 1992, the architects Luis Clotet and Ignacio Paricio Ansuategui transformed the former water reservoir Diposit de les Aigues into a modern university library. The graphic analysis of the transformation was followed by its expansion into a spa centre, designed by students Ala Talebian and Takumi Kondo, as a speculative step towards a possible 2050 conversion perspective. This discussion occurred during the academic seminar "Affordances of Architectural Typology" held by G. Postiglione, F. Serrazanetti, and M. Gold at the Technical University of Berlin in November 2023. Source: (Ala Talebian and Takumi Kondo in Architectural Affordances 2024)

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