

## **THE ADAPTABLE BUILDING: RESEARCH AND EXPERIMENTATION FOR CONTEMPORARY SOCIAL HOUSING**

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### **ABSTRACT**

In former times, the public residential sector was interested by the most important experimentations on housing issues. Today, it can still be considered a research field for new forms of urban sustainable development and housing challenges. The increasingly recurrent use of architectural competitions, together with the openness towards a wider range of users in the European social housing program, determined the establishment of solutions capable of answering to the current needs and of adapting to change. New research lines, starting from the analysis of the social transformations, propose a reinterpretation of the residential space responding to the present needs and anticipating the future ones. This approach contrasts with the traditional one, incapable of interpreting the contemporary social complexity. According to this approach, the building, once subject to rapid obsolescence, could become a long lasting good, accompanying the evolution of the desires and the lifestyles of the inhabitants throughout the time.

The adaptable building can be considered a valuable answer to the request for a house that accompanies the evolution of the inhabitants. This intent can be achieved through different strategies, referring to the dwelling scale or involving the housing complex as a whole. An architecture open to adaptability, able to anticipate and accommodate the desires and the needs of its occupants, is at the base of the new challenge for a sustainable growth.

Key words: social housing, adaptable building, flexibility, housing

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### Social Housing and Changing Needs

In the last decades, the major cities were interested by an uncontrolled urban development, frequently not supported by strategies for a compatible growth based on housing quality. Many recent residential expansions raised according to the law of market which, pursuing the maximum profit, promotes a standardized and outdated conception of the user rather than issues related to the contemporary cultural debate on housing.

The social housing sector, interested by the most important experimentations since the beginning of the XX Century, can be considered a valid research field for new forms of urban sustainable growth. The increasingly raising interest on the evolution of the habits and needs of the future inhabitants, the extension of the residential programs to a wider sector of society from a number of European governments, together with a recurrent use of architectural competitions for the selection of the best proposals, determined a growing openness towards solutions offering new response for the evolving requests and open to change. New research lines, proceeding from the analysis of the social transformations, propose a new interpretation of the residential space, which responds to the present desires and anticipates the future ones. This position is in contrast with the employ of traditional housing models, incapable of reading the contemporary social complexity.

The analysis of the statistic data on housing and society in Italy, compared to the European context, underlines the distance from the traditional patriarchal family. The traditional familiar structure is fragmented into new categories, which include single people, young workers, students, house-sharing people, and extended and one-parent families, generating a demand of new living spaces. The new forms of use, proceeding from different lifestyles, affect the distributive characters of the dwelling and the relationship between public and private space. In order to produce a reassessment of the traditional hierarchy of spaces, the needs expressed by the modern society should convey new demands, requiring spatial and distributive solutions reflecting contemporary living habits.

Nowadays, houses are often subject to rapid obsolesce, due to the dynamicity, fragmentation and rapidity of changes in lifestyles. On the other hand, a constantly raising demand for housing assures sales with high profits. Therefore, property developers are usually not interested in investing on innovation: the same, established solutions are offered to the housing market despite the transformations in our society. Inflexibility rules. This situation forces the dwellers to move away from their houses when new needs come into play, keeping the housing market into a constant state of demand. Most of the transformations noticed from the interviews released by the inhabitants of social housing complex, conducted through the application of the Post Occupancy Evaluation method on a selection of European case studies, regard the addition of space to extremely small dwellings, obtained through the inclusion of

existing balconies and terraces to the surface of the house, and the modification of the initial spatial distribution due to different uses. Many inhabitants also suffered the lack of external private areas, while aged people, after the emancipation of their sons, would have gladly moved to a smaller apartment in the same building. A possible alternative to those situations could be represented by the proposal of buildings designed to accommodate change and to accompany the evolution of the dwellers through the course of time.

According to this interpretation, the residential buildings, once subject to rapid obsolescence, could become a lasting good, accompanying the evolution of the needs and lifestyles of the inhabitants. On a urban level, enduring buildings could contribute to mitigate the housing tension, as well as the pressure on the suburban expansion areas. The current housing demand for different – not more – houses indeed explains the paradox of a wide unused real estate against an increasing request.

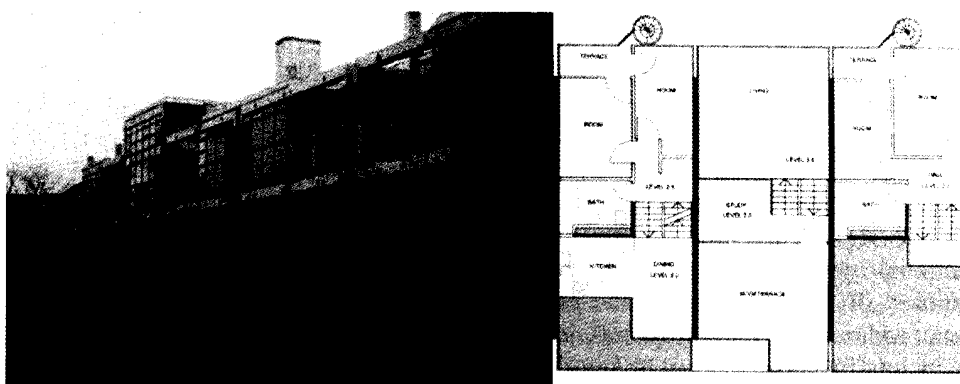
### The Adaptable Building

An adaptable building is a building responding to changes over time. This definition introduces two issues, related to the concept of adaptability. The first one is potentiality, which implies that change does not necessarily have to occur but that it must be possible; the second one is temporality, which refers to a specific period of time. In fact, it is possible to refer adaptability to long, medium and short term, where long-term adaptability considers the whole life of the building and includes the possibility of a complete change in use. The adaptable building is designed and realized for a long-term use. This implies a strong knowledge of present and future needs, together with a great adaptability to change. Modifications can occur in different ways: change can be planned in the initial project, providing different solutions in the same building, or through a time planning of the construction, expanding the inner surface of the house outwards or including additional spaces, in order to transform the living space quantitatively. The first strategy proposes housing differentiation in order to respond to a wide range of future users and to grant a correct mix of population in the same building. The difference among dwellings is not only related to dimension, but also to a disposition of spaces designed according to specific needs. The functional project of the building can also consider the prevision of common or working areas and satisfies the request of internal mobility. The second approach regards the modification of the housing units obtained by the inclusion of additional spaces. An important contribution to this process is offered by the evolution of the construction and environmental control systems. The prevision of future additional spaces responds in the first place to the need expressed by the inhabitants for a dwelling evolving through the years according to their lifestyle and family.

### Project Strategies

Since the end of the 19th Century and throughout the 20th, the potential of dwellings in term of adaptability and response to change was explored in architecture. In 1930 the projects presented for the competition 'Das Wachsende Haus' investigated the themes of horizontal and vertical expansion of the house. A common approach in the proposals was based on the application of a regular structure, which could be divided or extended. Another example is the PREVIii competition, which can be considered the paradigm of the evolution of the dwelling as the scenario of the life of the inhabitants. A fundamental aspect of this experience was represented by considering the inhabitant and its life as the core of the strategy, based on growth, expansion and adaptability to the transformation of lifestyles throughout the time [1].

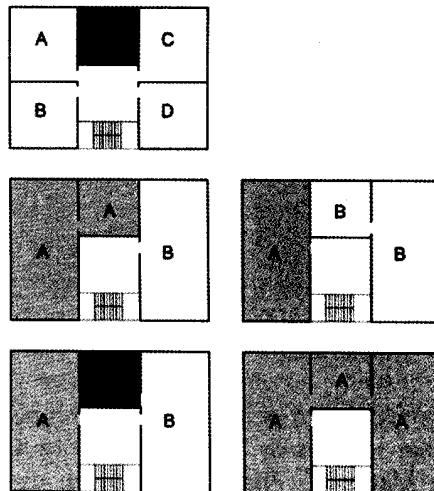
At a later stage, the dimensional growth of the dwelling was generally considered more appropriate for independent or detached houses, and difficult to apply to collective housing with medium and high density. In this case, in fact, the project has to involve strong regulation and structural complexity. The intervention has to be controlled and designed according to the original structure, in order to assure the coherence of the whole building in term of proportion and integrity. However, some architects explored these issues, including the prevision of extra spaces in the design process. The Kallebäck Experimental Housing project (Erik Friberger, 1960) is characterized by a structure designed to be filled through time, while in Feßtgasse Housing (Ottokar Uhl, 1980) expansion is provided by a mobile façade. In the housing complex on Koppstrasse, Wien, designed by Helmut Wimmer in 1999, the balconies, 2 meters deep, are designed like suspended gardens and can be included in the housing space [2]. The Genterstrasse housing development in Munich, designed by Otto Steidle in 1969, represents, according to his creator, an example of architecture embracing life. It has been expressly conceived for users whose expectations and future needs are not known.



**Figure 1 :** Genterstrasse housing development in Munich, Otto Steidle, 1969.

A prefabricated concrete structure defines a regular pattern and determines internal heights and modular lengths. The dwellings and the common areas are delineated through lightweight finished elements permitting an easy reconfiguration by the occupants. The sense of uncertain and temporality expressed by the architectural language embraces the modification of volumes and materials without changing the project's nature. The constructive system not only allows flexibility, but declares this potential change through its aesthetics. After over forty years the housing complex still maintain its function, without requiring significant maintenance, accompanying and interpreting the desires and aspiration of its inhabitants [3].

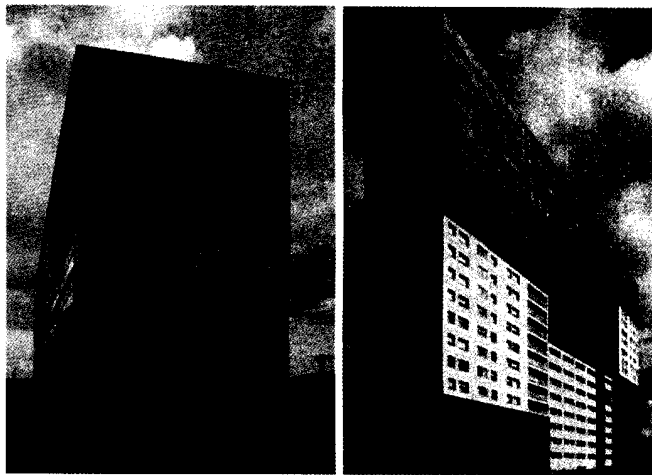
A different strategy can involve an internal reassessment of the building. This approach is based on the association of two or more independent apartments into a single one or, on the contrary, on the division of a large flat into two smaller independent units. Usually dwellings, although being part of a building, are designed as independent elements. In this way, the modification through annexation or division in a second time becomes more difficult and expensive. The prevision of this option in the design process, simplified by disposition or constructive expedients, assures a larger number of future options: from the union of two rooms to create a wider space, to the combination of a one-room flat with a four-room apartment to accommodate enlarged families. Another option is based on the prevision of a switch room (or small unit) used by one of two adjacent dwellings. It can be sold to the other apartment in a second time or become an independent or semi-independent flat used as an office or a guesthouse for relatives or caretakers in case of aged people, according to the evolving needs.



**Figure 2 :** The switch room and its evolution.

About long-term adaptability, in contemporary architecture high density residential buildings propose an alternative to the serial repetition of the housing model promoted

by the Modern Movement by offering options to different users and habits in the same complex. The concept of adaptability moves from the dwelling to the entire construction: the different opportunities offered by the adaptable building as a whole satisfy the new needs expressed over time by the occupants. Change is embraced by the variations in size and disposition of the different apartments, and future mobility is limited to the housing complex. This strategy, promoting the sense of belonging to a community, guarantees continuity and the conservation of the established social network, which is an important aspect especially for elderly people. The Silodam building, in Amsterdam, designed by MVRDV and financed by the municipality, includes part of social housing apartments for rent, dwellings for aged people in the highest level and flexible housing for privates. The allocation of the different types of houses in the building reproduces the concept of ‘neighborhood unit’ in a vertical structure, in order to promote the identification and social relationship typical of the quarter scale in an urban high-density context. The same approach has been proposed by MVRDV and Blanca Lleo in the Mirador building, which is part of the wide social housing program carried out by the municipality of Madrid during the first decade of the XXI century. In this intervention the different ‘neighborhood units’ are connected through the semi-public areas, represented by the central void that gives name to the intervention.



**Figures 3 :** Silodam, Amsterdam, MVRDV, 2002 (left). Mirador, Madrid, MVRDV e Blanca LLeo, 2005 (right).

The same strategy can be applied to low-density housing complex, as happened in the intervention for the steel plant workers in Terni projected by Giancarlo De Carlo in 1950, known as ‘Villaggio Matteotti’. Here the approach experimented under the influence of the issues about identity coming from the Team X debate generated 7 typologies and 45 different solutions. A more recent experience of successful mixing is the Donnybrook Quarter in London by Peter Barber Architects.



### Perspectives

In Italy, the distance from the cultural debate on housing of the XX Century and most of the realizations from 1970 onwards, together with the progressive release of the government support, generated the current crisis of the housing sector, regarding not only the rising demand but, more importantly, also the models proposed and their relationship with the urban context. Most of the remarkable interventions of recent times come from voluntary initiative or, more rarely, from architectural competitions results. The diffusion of a new culture on the variations of contemporary living, the promotion of intervention based on quality issues rather than on economic logics, both in public and private sector, would contribute to a more sustainable way of transforming our cities. Architecture and its adaptation ability can anticipate desires, aspirations and needs, preparing the ground for a more social future.

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<sup>i</sup> The interviews were conducted during a two year research program named 'L'abitazione sociale contemporanea. Analisi, valutazione critica, proposta operativa', supported by the Regione Autonoma della Sardegna, RAS, through a co-financed european scholarship, funds of PO Sardegna FSE 2007-2013, L.R.7/2007, in collaboration with PhD Romina Marvaldi. This investigation, starting from the selection of a range of European experimental case studies, verifies the correspondence between the targets pursued in the design of the built space and the real use of the building. The comparison between project purposes and results is developed through in-site listening processes, according to the principles of Post Occupancy Evaluation methodology. The analysis of the conformity of the project solutions responding to the transformations of lifestyles to the real use of the buildings contributed to the creation of a system informing on the answers generated by the new experimentations. More information: <[www.sohousing.it](http://www.sohousing.it)> (accessed 2013).

<sup>ii</sup> PREVI: Proyecto Experimental de Vivienda, Lima, Perú 1975. The first phase of the competition included 26 proposals: 13 developed by famous international architects (James Stirling; Knud Svenssons; Guerra, Samper Sáenz, Urdaneta; Atelier 5; Toivo Korhonen; Charles Correa; Kikutake, Maki, Kurokawa; Iñiguez de Onzoño, Vasquez de Castro; Hansen, Hatloy; Aldo van Eyck; Candilis, Josic, Woods; Christopher Alexander) and 13 by local architects. The definition of a housing unit capable of evolving according to a progressive and flexible growth, the study of the aggregation of these units into a quarter, the design of a urban project with low rise and high density with roads, pathways and public spaces and the proposal of a constructive system based on prefabrication and modularity were among the targets of the competition.