Survey instruments and planning strategies for the redevelopment of the social housing heritage in Italy: the case study of Pilastro, a district in Bologna

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**ABSTRACT:** This paper describes the partial results of a research conducted by various Italian Faculties of Architecture on the subject of renovation of social housing stock. This research aims at developing a methodology for multidisciplinary analysis and allows to implement a performance based on end-users’ needs and on standards provided by the regulations in force.

The research unit of the University of Bologna has focused its attention on a case study, the district of Pilastro, a significant example of social housing high density settlement, located in Bologna. The study of this neighbourhood aims at pointing out the factors the quality levels of the settlement depend on, enabling to assess their potential for redevelopment and to identify those elements that may be considered as a resistance to change.

This research then formulates preferential targets for a strategy of regeneration, selecting the most appropriate interventions to solve the inadequacies of a building of reference.

1 INTRODUCTION

This paper presents some partial results of an Italian national research, PRIN 2008, supported by the MIUR (Ministry for Education, University and Research), on the subject of ‘Renovation, regeneration and valorisation of social housing settlements built in the suburban areas in the second half of last century’ conducted by a team of researchers from the Faculty of Architecture of the University of Bologna, together with researchers from the University of Ferrara (National Coordinator: prof. Roberto di Giulio), University of Venice IUAV, Polytechnic of Turin, University ‘G. D’Annunzio’ of Chieti-Pescara.

Settlements models, housing patterns, social conditions of the inhabitants as well as the features of the high density buildings have contributed to the neighbourhood’s decay that today represents a serious technical and social emergency for many European cities (Di Giulio, R. 2010.). The objectives of this research consist in setting up the criteria for an investigation and evaluation of technical and procedures related instruments and of working models of intervention for the redevelopment of public housing stock, based on an adaptation of the uses to the new needs and to the environmental conditions (Grecchi, M. 2008).

2 THE PILASTRO DISTRICT

The research unit of the University of Bologna has focused on a case study, the district of Pilastro, located in the Emilia-Romagna regional capital, Bologna. It is a typical high-density settlement, with large housing estates, which has suffered since its creation of conditions of physical marginalization. This condition led to significant issues of social character.

The Pilastro neighborhood is a part of a PEEP (Piano di Edilizia Economica e Popolare) of 1962 approved by the City of Bologna and built by the IACP (Istituto Autonomo Case Popolari) in a period ranging from 1966 to 1986 (Fig. 1).
The study of the physical layout of this neighbourhood, starting from the various stages of the settlement and its relations with the surrounding area and the rest of the city, coupled with the awareness of the ongoing issues aims at pointing out the factors the quality levels of the settlement depend on, enabling to assess their potential for redevelopment and to identify those elements that may be considered as a resistance to change.

The results of the investigation highlighted a complex and sometimes contradictory reality, where next to feelings of disorientation and dissatisfaction were mixed with a heightened sense of belonging and rootedness.

There were episodes of petty crime and youth problems, which continued during the years, resulting in Pilastro being permanently labeled as a no-go area. However, as it often happens in the more marginal suburbs, great solidarity, dynamism and cultural vitality soon emerged. A highly distinctive feature of this occurrence was the participation of its occupants, who organized themselves effectively in a committee of tenants and directed the decisions influencing the future of their neighborhood.

Today, Pilastro, with its 7,500 tenants, is provided with a number of facilities surpassing the needs of its occupants and attracts people from all over the city; it has a wealth of green spaces and public parks unmatched in Bologna, and an efficient public transport service linking it with the city center. Most problems of social and public nature were solved, however the strong sense of unity between the residents has come loose and the participatory spirit of the past has been lost. It seems even more desolate and less frequented than when it suffered from total isolation: now, the streets are empty, its squares do not function as places for meeting and socializing and the few business promises next to the homes are empty.

Some of the causes of these dynamics are to be found not only in the changed social habits and the demographic mutations, typical of many suburbs, but also in the rigidity of the urban plan and of the system of building types. There is a clear separation between residential buildings and the structures built for other uses; it lacks of small businesses and personal services, which can create an attraction and a local confluence of users, consisting of a particularly high number of elderly people, with special needs in terms of relationships with neighbors and local services.

The consistent uniformity of the fronts is perceived by the occupants as a trademark revealing its low-income social class, and, in absence of other cementing elements, it doesn’t help to
create an ‘urban effect’ that could coincide with a sense of recognition and belonging. The penury of the external finishes and the degradation, so evident in many buildings, reveal the current difficulties ACER Bologna, the managing body of the public housing stock in Bologna, is experiencing in coping with maintenance and other works they need.

The sale of public properties has led to complications in carrying out any necessary interventions on housing estates that have multiple owners: at Pilastro, the percentages of private and public property are now the same.

3 THE ANALYSIS OF THE QUALITY

In order to manage synthetic information (quantitative and qualitative one) on specific case studies concerning public housing, a number of descriptive parameters were developed based on the ones generated by European researches, such as EPQR and HQE2R, and on the main systems of evaluation and rating of the buildings, such as LEED, and implemented with the Quality Matrix of AUDIS, as applied in the Emilia Romagna region.

The parameters were grouped according to the ‘qualities’ they help to achieve. The qualities, divided into Planning Quality, Architectural Quality, Social Quality, Economic Quality, Environmental/Energy Quality, are the targets of an hypothetical intervention of regeneration of the suburban area. For the case study of Pilastro, some parameters returned positive values and potential for change, while others represented negative elements of resistance and obstruction to the transformation.

The research brought out with clarity the two most critical aspects linked to the Architectural and Social Qualities. The first is increasingly affected by the decay of the built heritage, due to age, lack of maintenance and poor initial quality of the product. The parameters that contribute to the Social Quality are the most interesting and provide a complex and singular profile: they describe the elements of strengths and weakness of Pilastro at the same time.

Our analysis highlighted that the marginalization of Pilastro is not so much due to its physical location, since it can be reduced by creating an interconnection between the different elements of this district and the city. Increasing the connections and synergy between the different parts of Pilastro and organizing all available resources becomes an important guideline for a strategy of redevelopment. These resources consist of a wide range of services and facilities, already in existence in the neighborhood, but located in marginal areas, difficult to reach, of the presence of empty buildings waiting to be rented or that could be converted to other uses, the widespread green areas, sports facilities and urban parks. In particular, the design of green areas could represent an important opportunity for reconnecting the neighborhood to the surrounding areas and, through these last ones, to the city on the south side and to the environment and historical landscape to the north side.

Therefore, the physical and functional reconnection depends on a strategy that can provide the creation of a network connecting the different significant elements in existence or projected ones, and the creation of activities aiming at a revitalization of the neighborhood and at its placement in a relationship network, that involves the entire city and its territory.

4 THE BUILDING OF REFERENCE AND THE STRATEGIES FOR ITS REFURBISHMENT

A building of reference was studied in detail, both as regard its enjoyment by the users and its responsiveness to their expectations, and in terms of their typological and constructive feature, in order to select the most appropriate interventions to solve its inadequacies. ‘Virgolone’ (Figs 3-4), this is the building name, was chosen for its semantic relevance, for its imposing size (it is a linear building with 552 apartments) and its particular construction techniques. Its energy behavior was verified and its weak points were checked through instrumental surveys on site. The in-depth study of the energy issues analyzed the envelope and the plant equipment, cross-comparing the actual data of consumption of electricity, derived from the bills paid by the occupants, with the results of an energy assessment performed with a validated software UNI/TS (Termolog, Fig. 2). A model simulation of energy behavior was developed: it allowed, by
changing the various factors, to assess which technological components were to be amended to improve the energy behavior and, then, to derive design guidelines for an energy redevelop-

Fig 2: Energy assessment of the Virgolone building (performed with Termolog).
Total Ep: 118.54 kWh/m$^2$y
The production of hot water is not included (it amounts to 24.40 kWh/m$^2$y)

This study on the building of reference is complemented with the proposals of some interventions for morphological and energy improvement and for optimizing the use of space in order to increase the housing footage, as well as for providing an integration of renewable energy.

Today the interior of the building, articulated in various types and sizes, shows limits of usability and features of distribution (due to tunnel system, a strong limit to the adaptability of flats) that often make them inadequate to the actual needs. Making housing flexible and, by doing so, responding to a change of tenants with diversified needs, turnover and characterizing the suburbs with several functions and services (this requirement can be useful to their regeneration) is a way of responding to new environmental needs.

Fig 3 and 4: Views of the 700 meters long building named ‘Virgolone’, built in 1975

Based on the analysis of the building, the research aimed at identifying an intervention strategy, derived from both the enhancement of the specific aspects and from the analysis of a selection of Italian and European experiences presenting common ground with our case study (Clemente, C., Matteis, F. 2010). This strategy is organized in several stages of intervention, starting from the easiest in terms of financial investment and impact on the building residents. These phases of intervention allow to achieve different objectives for the improvement of the quality of living conditions and of the energy behavior of the building (Sassi, P. 2006).

In particular, these objectives can be summarized as an improvement of the energy performance of the building, re-designing the layout of flats, to make them more compatible with the needs of the occupants, the creation of a new image for the complex, the introduction of activities different from the residential one in order to break up the mono-functionality of the building
and of services of strategic importance for revitalizing the Pasolini Park and the district in general.

4.1 Phases of intervention

The intervention with the lowest impact, that could be carried out without moving the residents, consists in an application of a thermal insulation envelope and a replacement of the single-glazed windows with new ones with high thermal performance. The energy analysis of the building (blower-door test, thermo-graphic analysis, energy behavior simulation) has confirmed the priority of such interventions and their effectiveness in terms of a significant reduction in consumptions. The resulting visual configuration of the building is characterized by the application of a coating of high pressure plastic laminated panels on the insulated envelope, with three different shades of green and three different dimensional modules. This solution gives a new image to the building as the facades are now characterized by the horizontal pattern of the glazed elements. The building access points were also made much more evident by highlighting the staircases with a continuous red coating and by applying, on the ground floor, indications on the location of the different areas.

The next step consists in a modification of the indoor layout of the flats with the purpose of carrying out a correct sizing of the living spaces, currently under standard, improving the flats hygienic conditions and their use through a definition of spatial solutions adaptable to different typologies of household. Flats of small size are also foreseen; these could be, where necessary, combined together for the generation of new typologies.

This intervention can be carried out by operating almost solely on non-bearing partitions and it involves few changes to the tunnel structure elements. These new partitions are dry ones and can be easily relocated. Both of the previously described phases can be carried out independently of each other or at the same time.

The most invasive intervention involves a redefinition of the building volume: the replacement of the facade prefabricated panels with other ones more efficient in terms of energy performance allows also a redesigning of the facades and of the openings.

The last mentioned ones can be extended on the south side to optimize the level of indoor lighting comfort and enhance the view on the park, and reduced on the north side, to reduce heat losses during the winter. The moving back or forward of the walls allows the creation of balconies and loggias and a higher degree of quality of the interior spaces.

This intervention can be integrated and finished off with a further step: an addition of self-supporting towers, in order to improve the seismic behavior of the building, as these towers act as stiffening elements in the most vulnerable direction, and in order to offer an updated image of the building and generate new opportunities for an expansion of the flats.

These towers, consisting of a metal structure with modules of 3x3 meters, are positioned flush to the existing volume, next to the smaller size flats. These modules frames can be used as extra space for the flats through the application of light dry technologies, or can be provided with proper flooring to create a terrace.

Further to this, the towers location on the south side marks the entrances to the stairwells, easing the identification for those coming from the park (Figs 5-6).

The last phase of the project involves the introduction of new volumes on the ground floor to be used for the housing estate additional services. These will act as a reference point for the paths designed to link Virgolone with the rest of the neighborhood and are part of the overall project that involves all of the Pilastro district.

The different strategies of intervention on the building are complete with solutions aimed at reducing the complex operating costs: for instance, an improvement in the plants solutions, such as the replacement of power generation systems with higher performance solutions, the installation of controlled mechanical ventilation systems with heat recovery units in each single flat, the integration with renewable energy sources, is provided. The simulation model of the behavior of the building allows to verify the effectiveness of the designed interventions in terms of a reduction in the energy needs.
5 CONCLUSION

This research brings out with clarity the two most critical aspects, now linked to the social and architectural quality. The first is increasingly affected by the obsolescence and decay of the built heritage, due to its age, lack of maintenance and poor initial quality of the product. The needs of the ever changing user groups do not find full satisfaction in older types of accommodation, often underused or used improperly. The uniform, repetitive and poor image of buildings, even if, at the time, were the results of careful planning, is now associated with degradation.

The parameters that contribute to the social quality are most interesting and provide a complex and singular profile. It can be stated that they describe the elements of strength and weakness of Pilastro when mixed together: people were, and still are, the main resource of the district, although their composition has changed.

The research then identifies in the architectural and social quality the two preferential targets to aim for in a strategy of development and regeneration of the Pilastro neighborhood. However, the need to narrow the research areas and to identify objectives that can be realistically achieved, should take into consideration and compare the many problems that the analysis of large urban areas brings out and place them in a multidisciplinary perspective. One issue that can be considered strategic to the success of a regeneration program, is the management of both the planning and the constructive phases of physical interventions to be made on the buildings: the participation and shared decisions in the drafting of the project and the reaching of an agreement between the various estates, the understanding on the part of the owners and tenants of their possible temporary transfer, the financial cost of the works and of its use.

REFERENCES


