

## Urban Infill as Strategy for Social Housing Stock

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### 1 ABSTRACT

In Italy, especially in large urban centers, the public building stock represents a large portion of the consolidated city that is in a state of disrepair due to the aging and to the processes of degradation and marginalization.

In addition to the well-known difficulties derived from residential prevalent use in these residential complexes, however, there is a considerable number of spaces at ground floor raised on "pilotis", places designed for the community but nowadays spaces of transit, without a specific destination use and without specific qualities, residual or abandoned in most cases and therefore perceived as dangerous by the inhabitants.

A departmental research conducted on the case of Rome and developed at DIPSA of the University of Roma Tre has highlighted the problems common to Piani di Zona made accordingly to Law n.167/1962 but also the potential for transformation of space porches free.

From this research, the international design competition PASS- Plan for Social and Sustainable Housing – has identified the project themes from which to increase, and specify, the number of flats, to achieve a sustainable energy behavior of existing buildings, with the 'overall goal of initiating a process of wider redevelopment, as well as the procedural steps through which the institution ATER Roma in an exemplary manner is beginning the process of upgrading the complex Tiburtino III.

The contribution of the report is to present and share the issues identified, the specific competition procedure used and the results obtained, such as references to a possible and practical method of intervention in the consolidated city.

### 2 INTRODUCTION

In 2010, the Housing Association of public housing stock in Rome (ATER- Roma) has adopted the main elements of a long process of research undertaken by the Department DIPSA Roma Tre University on the subject of redevelopment of public housing stock built in Rome, launching the international design competition PASS – Project for Social and Sustainable Housing.

From a first phase of the investigation it was found that the residential housing stock realized with the first Plans for Economic and public housing (PEEP) presents many porches spaces (approximately 222,000 square meters), today underutilized and devoid of quality, a second phase has made it clear that these spaces, together with those present on the roof top of the buildings, if properly converted, could accommodate new functions or increase the housing stock of public assets.



Fig. 1: Buildings at Tiburtino III in Rome.

For the important implications of this analysis and application of recent regional standards, the case study of the plan area Tiburtino III (Fig. 1) was chosen from ATER Roma as a framework for testing an international design competition.

### 3 THE ITALIAN SCENARIO

The Italian public social housing stock has been built mainly in three phases. The first historical period coincides with the decade known as post-war reconstruction period (1945-1950), in which huge public investments were applied. The intent was to rebuild more than one million rooms destroyed by the war.

Between 1950 and 1970, the State supported new housing developments by extensive investments. In the social sector the first important resolution was the INA-CASA programme (part of the Employment Act 1949). In a six months time, 649 building sites were posed. When the plans were fully completed 2.800 dwellings per week were realized, enabling to give house to 560 households a week.

With the aim of employment of often underqualified personnel, all the technological innovation was expressively restrained in these programmes; all the INA CASA districts are characterized by small buildings, small neighbourhoods and vernacular themes.

A second important national programme is given by the GESCAL Trust Funds (GEstioneCAsE Lavoratori) between 1967 and 1973.

Both the two programmes are at the base of a widespread homogeneity for typological and constructive solutions within the Italian building stock of those early years.

A first variety is introduced with the housing programmes in several larger cities that follow the national law on social housing in 1962. In the city of Rome i.e. most of the public housing stock planned between 1960 and 1980 has been realized using two programmes of 1967 and 1985 based on the said law (Piani per l'Edilizia Economica e Popolare, P.E.E.P.). The P.E.E.P. instruments allowed the realization of 67 districts with a total of 551.073 rooms equivalent to 44.085.840 cubic meters of built volume. P.E.E.P. districts are built by prefabricated system, present tall buildings with a lot of public space.

Public social housing is also designed for an abstract model of the average family, an idea that we can no longer recognize in today's society. Young couples, the elderly, extended families are just some of the new users who need accommodation.

#### 3.1 Academic research at University of Roma Tre

The Dipartimento di Progettazione e Studio dell'Architettura of University of Roma Tre (DIPSA) has focused its researches on rehabilitation of the housing stock built in Rome under the first programme law n. 167 of 1962.

An initial fact-finding investigation<sup>1</sup> on a residential complex has identified the main issues of the aging building stock and the possible strategies to be applied not only to solve the obsolescence of the building elements but also to counter the deterioration of the city: marginality, monofunctionality, low maintenance etc.

The procedures identified in order to obtain an organic project that redesign entire look of the district Tiburtino III chosen as case study are: interventions at the base of the building, the wrapping, the roof and re-distribution of existing dwellings. The district shows all the characteristic signs of decay, abandonment and isolation common to many other public districts made in those years.

A subsequent research undertaken by Barbara Del Brocco (2008) has investigated the potential for transformation of the free spaces at the base of buildings, recurring theme of architecture of public districts. The ground floors, generally designed with porch, conceived as places of community, are rapidly transformed in areas without a precise destination and without quality, transit sites becoming neglected or, at worst, residual spaces avoided by the people because they are perceived as dangerous. The research investigates possible transformations of these spaces in relationship to the environmental and social context, particularly by infill development with selected functions. These interventions, with its point and one-off

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<sup>1</sup> Collaboration for the research "Innovative intervention of rehabilitation of public housing stock". Coordinator prof. arch. Andrea Vidotto, DIPSA Dipartimento di progettazione studio dell'architettura, Università Roma Tre. B. Del Brocco, M. De Matteis, C. Frazzoni, M.L. Olivetti. S. Pollak, F. Riccardo.

approach, could constitute a “micro-network” spread in the urban fabric in order to start a bigger process of urban regeneration. The objective of this investigation is to stimulate local Administrations, Housing Associations, inhabitants and media to consider porch floor an important resource for renovation of housing stock, and, if it will be conveniently filled, it could become the flywheel of outskirts rehabilitation.

Research shows that the ground floor can be considered a resource for the transformation of the stock of public housing built with the first PEEP between 1967 and 1985 in Rome. In particular, the porch floor appears to be a recurring theme of architecture built in those years, although it declined in different ways and in spite of specific conditions.

In the first we have tried to determine the amount of free space at the foot of the buildings available for processing. The lack of collaboration ATER and, perhaps, the real inability to know the areas of overall porch floor of their assets, has meant that it was necessary to adopt an alternative strategy. Assuming that the architecture is an expression full of technical regulations has been proposed a cross-reading of public housing with the laws and regulations that have generated to determine the amount of space available for processing.

If ground porch floor takes its origin from the “5 points of Architecture” of Le Corbusier, it is important to find out its first appearance in social housing stock in Italy. So it is of prime importance to analyze the principal laws and regulations on social housing in Italy, especially in Rome chosen as context of reference of research.

## 4 EVOLUTION OF SOCIAL HOUSING IN ITALY

### 4.1 The urban block and the garden city (1900-1930)

With Luzzatti Laws n. 254/ 1903, the Italian government intervenes directly in the field of social housing, in fact, after this law enables public and private bodies and cooperatives in moral or autonomous institutions to build housing. The goal is to promote and coordinate the philanthropic and spontaneous initiatives.

In the first period of expansion after the unification of the country the reference model is the city block, and social housing, sets against private construction, differs from these in terms of habitable, greater distance between the buildings in a same block, the greater amplitude of the courtyard in order to respond to new requirements for ventilation and natural lighting, such as Testaccio in Rome by Magni (1910-1913) (Fig. 2).



Fig. 2: Testaccio in Rome by Magni (1910-1913)

The language of social housing is almost identical to that of private construction: basements, architecture, pilasters and cornices are common to both nineteenth-century taste.

If the language remains the same, the urban grid pattern gives way to garden city, as Garbatella (1926) (Fig.3) or Aniene (1920).

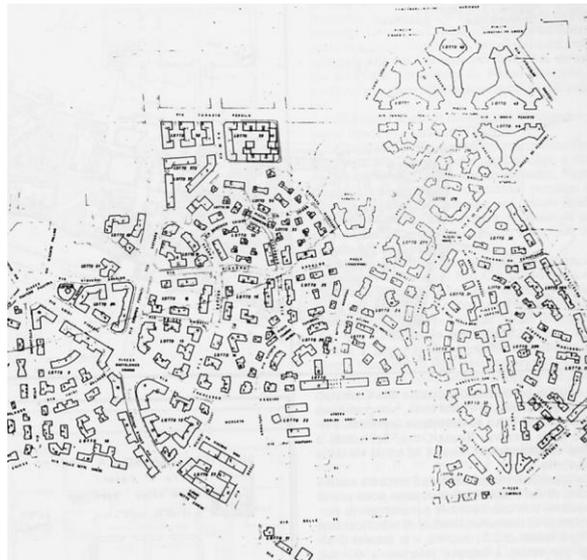


Fig. 3: Garbatella in Rome (1926)

The basement rooted to the ground, for structural reasons, is characterized by small windows and rusticated in some cases with the presence of shops and stores, the dwellings start from the first floor.

In Europe the principles of the Modern Movement begin to assert and in Italy is called Rationalism; the social housing in Rome, however, is not affected by these influences.

The 1930 season marks the end of the largest residential building and in 1939 there is a drastic reduction of the decorations.

From that moment, the role of Housing Association will always be more tangential to the functioning of the market and increasingly influenced by urban policy of fascism. The area of intervention will be to immigrants and their barracks or some of the people expelled from districts with the most rapid liberalization of rents and the intensification of the politics of demolition.

#### 4.2 The INA-CASA programme – The first seven years 1949-1956

With the aim to solve simultaneously the problem of unemployment and the house comes into force the Law n. 43 of 28 February 1949 "Employment growth plan working", known as the Law Fanfani or INA-CASA Programme. The INA CASA Programme (1949-1963) can be divided into two periods of 7 years each. To support the design, the INA CASA prepares a manual consisting of 4 issues, 2 for every seven years. The famous Italian architect Adalberto Libera will be the curator of the first 2 issues and be supported among others by Gorio and will be design office manager from 1949 to 1954 and later consultant.

The first volume of "Suggestions, rules and schemes for the preparation and presentation of projects – Announcements of competitions" (INA CASA, 1949) presents a set of blueprints for 4 building types: multi-storey building, isolated multi-storey building, one-storey row house and the row house.

The second " Suggestions, examples and standards for urban design. Projects Type " (INA CASA, 1950) shows a series of Anglo-Saxon and Scandinavian examples, such as garden city and new empirism.

If the internal organization of the accommodation suggested by the manual reflects the studies of the Modern Movement, urban facilities recommended are more bound to respect the site and the history of the country.

The two Guidelines text-books contains several suggestions for designers and they allow dwellings at ground floor. We can assert that Unité d'Habitation of Tuscolano designed by Adalberto Libera in 1950 is the only realization with porch floor in Rome in that period.<sup>2</sup> (Fig.4).

#### 4.3 The INA-CASA programme – The second seven years 1956-1963

From 1955 INA CASA starts a revision of standards for the design, following the referendum and surveys of recipients of housing, and organizes a conference attended by the most important exponents of Italian

<sup>2</sup> We can notice that Libera is the designer of other two semipublic districts with porch floor, Villaggio Olimpico 1957 and Decima district 1960 and he is also one of the architects involved into guidelines working out.

architecture, including Adalberto Libera and in 1956 publishes the third booklet "Guide for the examination of the INA CASA projects to be implemented in the second seven years.



Fig. 4: Unité d'Habitation of Tuscolano in Rome -Adalberto Libera in 1950

Tall buildings are not allowed more than 3 floors, flats at ground floor are forbidden unless measures to avoid introspection and the unpleasant effects of moisture. Therefore recommend that the basement floors are at least 60 cm above the ground level, below which there are well-ventilated basements. It is encouraged to use the ground floor for remittances for local scooters and bicycles, or areas for children's play (INA Casa 1956, p.12).

In this period we found in Rome only two buildings with porch floor: the 1957 Ponte Mammolo by Vaccaro who has worked with Libera, and the 1958 Acilia by Del Debbio.

#### 4.3.1 In search of pilotis: a hypothesis

In the projects of Adalberto Libera is common the use of porch floor at the ground floor; for him is an essential sign of innovation, as he asserted during a conference in Florence .

The porch floor, in the architecture of public housing in Rome, appears for the first time in 1954 in the Unité d'Habitation of Adalberto Libera at Tuscolano III. It can be found in other projects prepared by the architect: project of the district Pineto in 1957 with eng. G. Vaccaro; project of the residential district at Grottaperfetta in 1957-60 with the other architects Monaco and Luccichenti; Olympic Village in 1957-1960 designed with Cafiero, Monaco e Luccichenti e Moretti; and the district INCIS at Decima in 1960-1966 with Cafiero, Guidi e Moretti.

It is important to note that Vaccaro, who had worked with Libera in the project for the neighborhood Pineto in 1957, is the author of the other district of the second seven years of INA CASA programme in which appear the porch floor, Ponte Mammolo (1957-62). Libera has been manager of the technical office of INA CASA from 1949 to 1954 and then plays the role of outside counsel, but in the first two volumes of Suggestions for the design there is no reference to porch floor. However, we should consider the incessant search for Libera on Unité d'Habitation, especially when compared with Le Corbusier's theories.

So we can easily state that the appearance of the porch through the second seven years of INA CASA is primarily due to the architect Adalberto Libera.

#### 4.4 The ten-year plan GESCAL (1963-1973)

With the end of the INA CASA Plan are established GESCAL Trust Funds (GESTioneCAsE Lavoratori) for the implementation of the ten-year plan. The Law 60/1963 establishes the Central Committee with responsibility for overall planning and management of houses for workers . In 1963 is enacted GESCAL technique legislation with the primary objective of addressing, through detailed provisions, the implementation of action plans in the building of districts named Piani di Zona.

The technical legislation incorporates some topics of the rules of the INA CASA Plan, in particular reaffirms the prohibition to have ground floor accommodation and, in fact, requires the arcade at the ground floor of buildings. The architect Pietro Barucci, in an interview (Del Brocco 2008, p. 79), says that the porch floor inside GESCAL technical standards can be considered a "victory" of architect Moroni, designer of Spinaceto, one of the districts built in this period, who insisted that this sign of modernity was inserted in the rules.

The Article n.27 affirms “Ground floors in the covered area, free spaces surrounded by walls, shall not be less than one third of the total area of the building, and allow ample communication between the areas surrounding the buildings”. The ten years Programme of GESCAL (1963-1973) and its technical Regulation confirms the prohibition to build dwellings on the ground floor and it forces the passing portico.

The law n.167 1962 sets up the Piani di zona (districts), where local administrations has to locate areas for social housing. The first programme, in Rome i.e., allows the realization of 67 districts, 21,1 millions of residential cubic meters equivalent to 273.487 rooms.

Other national laws modify the way of designing buildings: the law n.513 of 1977 and n.457 of 1978. They reduce common spaces and passing porch disappears. The introduction of the “virtual height”, an abstract value, suggests to have ground floor on pilotis close to cellars or small stores.

#### 4.4.1 First Plan for and Economic and social Housing in Rome

In 1962 Law 167 is enacted, it requires municipalities with populations greater than 50,000 inhabitants to prepare Piani di zona (districts), for public housing and in the same year in Rome is adopted the new General Master Plan. Two years after, February 26, 1964, the municipality of Rome launches its first Plan for Economic and social Housing (PEEP). The program identifies 70 areas to house 700,000 people covering an area of 5,000 hectares. The plan will be subsequently reduced to 460,000 rooms and at the end (1985) it will be realized only 270,000 rooms. It is the greatest plan in Italy.

We can identify three main stages in the schematic that coincide with three different approaches to the design of new neighborhoods.

In the startup (1968-71) is very strong the influence of utopias of mega-structuralist movement and all the projects, including Spinaceto Tor de Cenci, Casal de Pazzi Nomentano, Tiburtino, represent a formalization of the "town-design", urban design in large scale

In the first neighborhoods the passing porch is always present, as noted by the critic Sergio Lenci "earned in those years, a standard abstract, which acted negatively, as, for example, to prescribe the general adoption of the porch on the ground floor. This rule has caused hectares of arcades unnecessary, harmful to the creation of urban spaces in the maintenance and management has not been attributed to the individual, but was entrusted to institutions that have given up immediatly." (Bossalino and Cotti, 1992).

The 70s, central phase, are characterized by large "architectural objects", a large building types that integrate their internal spaces and service spaces. This is the case of Corviale, Laurentino and partly Vigne Nuove in which seems to end the morphology of the whole configuration of the main building, in a coincidence between building type and morphology of the "urban part".

The third generation of districts (1977-1980) sees the presence of two opposing trends project: the first that refers to previous research on the large urban signs Torrecchia, and a second looking for a relationship with the urban fabric of the traditional type.

The research investigates only the districts made with the GESCAL technical Regulation up to 1977. So If we exclude the last period, the districts built of up to 1977 in Rome are 25 and the porch floor according to the legislation had to be equal to 25 % of the built-on area, amounts to 222,000 square meters. These space is empty and available to be transformed and can be filled with new selected functions.

If we take into account that all these settlements still suffer the lack of public services , principally due in the first phase to the unwillingness of the administration to take charge of management and in the intermediate stage, the lack of funding. We can conclude that the huge surface of empty space at the ground floor can be used to regenerate all the district.

## 5 CASE OF STUDY TIBURTINO III IN ROME

Tiburtino III 15 bis (1972-75) is one of the districts built during the law n.167 and it has been chosen as a specific case of study in order to check the interventions in relationship with the goals. Its empty spaces at ground floor are: not fully utilized; in most of cases neglected and dirty; not well lighted; often place of micro-criminality; only in one case are maintained by inhabitants. (Fig. 5)

The research takes into account the recent investigation made by CRESME-Center for Economic Research Social Market for Building and Land-, on suburbs of Rome (AeT. and CRESME, 2007) in which it emerges

a new demand of residential quality in the areas build under the social housing law of 1962 n.167. It expresses a demand of maintenance of old housing stock on one hand, and on the other hand a demand of facilities.



Fig. 5: An example of empty space at ground floor at Tiburtino III

The facilities wished by inhabitants are: Office for Fiscal Adviser; Office for administrative practice; Energy point and advisory services for energy saving; kindergarten for children; bicycle rent.

The available surface of the district, less than 25 % of built-on area is 2.000 sq. If we consider that for 1784 sq to rehabilitate it is necessary about 890.000 €.

A final phase of the investigation has probed the possibility of involvement of the inhabitants. The desire to take care for these spaces was already inherent in the district, are in fact many of the signs that reveal a desire for redemption of collective space: limited appropriations, fences consist of vases, chairs arranged so well. A two-month workshop was led eventually with students at the school of Arts located in the district. They, left free to interpret the empty spaces at the ground floor along the main street, have identified the first functions to be placed and then have showed elementary but effective proposals for redevelopment.

## 6 INTERNATIONAL COMPETITION

In March 2010, ATER Roma (Housing Association of Rome) welcoming the opportunity to reuse the free spaces at the ground floor of the buildings, with the support of the Lazio Region and from the new provisions of the regional legislation, has given the world the professional challenge of providing a concrete and feasible answer about the densification of the consolidated city, launching the procedure of the international design competition, whose care and scientific organization was assigned to DIPSА.<sup>3</sup> The international design competition PASS – Plan for Social and Sustainable Homes is an application of the specific results of a long process of research undertaken by DIPSА – Department of Design and study of Architecture of University of Roma Tre on the topics of rehabilitation of public housing stock in Rome. Thanks also to the new regional law – Piano Casa- that allows the increases in cubic volume to regenerate the public urban stock.

The competition is coherent with regional regulatory guidance that allow the intervention on existing buildings with the aim of increasing the housing supply in the area of public social housing.

Subject of the international design competition “PASS – design for sustainable social housing“ is the redevelopment of the portion of E.R.P. (Public Housing) compound located in P.d.Z. (District Plan) n. 15 bis – Tiburtino III – lots included between via Grotte di Gregna and via Mozart – through gain of approx 120 new public housing units, new services equipment for the district, redevelopment of public spaces, integrated interventions to improve the energetic behavior of existing buildings (consisting in approx 450 housing units), in order to improve housings living quality, the energetic performance, innovate equipment systems for a sustainable management.

Some 50 project proposals developed by groups of professionals, have declined in different and innovative ways the architectural quality, with the issues of energy sustainability, environmental and economic.

<sup>3</sup> SCIENTIFIC CONSULTANCY OF COMPETITION PROCEDURE UNIVERSITY ROMA TRE- DIPSА – Department of Design and architectural studies- Scientific Coordination and drafting of Preliminary Design Document: arch. Mariella Annese, arch. Barbara Del Brocco. Technical and administrative planning arch. Mariella Annese.

The exchange of professional experience has reopened the cultural debate about re-densification the consolidated city and has generated several ideas on how to transform public housing stock.

The competition was won by the group led by the Spanish office Espegel-Fisac, with other two winning projects (2nd place by the group led by SMTstudio Associates Architects, 3rd study Molestina Architekten), and 3 mentioned (Parasite study, NEXT architects , 3TI Progetto italia).

Characteristic of the winning project is to undermine the rigid system of Tiburtino III filleting the courtyards and public space with the ground floor of the buildings, set at 70 cm, with an organic design with ramps.

As for the new housing, penthouses on floors and porches have been proposed distinct types (Fig.6).On the roof there are two types of composition: the first type, located on the exterior of the buildings sector, has a configuration introverted, with its areas shielded from the terrace surfaces and distributed along "corridors bright", so as to give each of them a direct relationship with the open space in private rooms at the second type, provided on the inner buildings of the complex, all rooms have aggregated around a patio, a private open space from which you access the housing units (quote of the Roman impluvium houses ) .

The unit plans at porch floor, however, is formed instead of a central core that contains all the technical installations and wetlands, while the living spaces open onto private terraces, private conceived as ideal extension of the public green in front of the rooms bed, facing instead on areas behind, protected by vegetation belts. For the redevelopment of the existing facades has been proposed a modular prefab that clips to the existing structure, a ventilated flat panels. In correspondence of the lodges and the windows, the system allows to create "blades" openable and closable to adjust the amount of solar radiation, the ventilation and the level of external view.



Fig. 6: The project of Espegel-Fisac

The project 2nd place (SMTstudio Architetti Associati) gives to the public space a dominant role. The open spaces between the buildings are transformed into parterre replacing the vehicular traffic, reorganized on the fringe. The design of the paving trace the footprint on the ground of buildings and detects the insertion of several programmable functions according to the needs of the inhabitants (Fig. 7). The base, particularly in the courtyard, it expanded into squares conceived as outdoor living rooms that resolve differences of quotas by improving accessibility through the fitting of a plane sloping green that covers the volumes of the existing cellars. To obtain the shielding for private open spaces, the dwellings at porch floor are obtained by reformulating the existing service volumes, volumes that become translucent colored, strongly recognizable. On the roof, however, the settlement system involves the aggregation of prefabricated modules with a clear formal identity of pitched roofs, configure a new urban fabric held together by a kind of main street and small public squares in height.

The proposal of the Molestina Architekten firm, 3rd place, begins from a careful analysis of the site in terms of use of space and from the belief that the evident signs of obsolescence must somehow be preserved, even put on display. For this reason, the project envelops all built in a new polycarbonate skin that gives a new identity to the neighborhood, while preserving the visibility of the status quo (Fig. 8).

The "greenhouse" defines a unique space, penetrated by light and air, transitional space between public and private, it becomes a meeting place for residents which also contributes to the energy balance of buildings; plants that grow in it improve the microclimate and purify the air and, depending on the season, connote the

look through colors and scents . With regard to housing, those places in the plans arcades are characterized by high flexibility: each unit has secured a double cross ventilation, exposure to light and great views. The accommodation located on the roofs are equipped with balconies on both sides and are open on the greenhouses of the common terraces.



Fig. 7: The project of SMTstudio Architetti Associati



Fig. 8: The project of Molestina Architekten firm

## 7 CONCLUSION

The result of the competition, contrary to what is usual, has been followed with the award to the winning team of the assignment for the final design, which ended in 2011. Waiting for regional funds for subsequent phases of design and construction, an initial assessment of the whole process can be expressed.

The great variety of proposals received and the wealth of presented architectural solutions evidence that reflection on possible intervention in the city built is very large and full of themes and facets. The procedure of the design competition also proves to be the ideal range for a fertile exchange of professional experience on the issues, but also an opportunity for research institutions and the policies to define effective collaborations and partnerships, through which assume a survey methodology and of concrete intervention in the consolidated city.

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