

Public Housing Renovation in Porto: Typology versus Occupancy Density

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Abstract

In the 1950s a ten-year municipal plan (and its subsequent five-year extension) set off the construction of many public housing complexes in Porto to solve the need for housing, as industrialization phenomena had caused relevant migration to cities. These housing settlements (near half of the current total public housing in Porto), despite their careful urban design, do not present nowadays satisfactory quality level (constructive, but also architectural and residential), failing to comply with some of the present regulations and living standard expectations (e.g. dwellings reduced area). In the last few years, some of these residential units have been renovated.

One reference case is presented, a 1953 municipal housing in Porto presently under renovation, illustrating the urban regeneration that may result if deeper housing refurbishment is contemplated on a municipal strategy, without necessarily a much higher investment. Original dwelling typologies (with very limited area) are merged to give place to new ones (now in accordance to present regulations), apparently reducing population density of the related area. This paper also addresses the false impression that may occur when municipal housing management policies and distribution are based on dwelling typology.

1 Introduction

Population density measures the number of persons per unit area. Thus, for the same construction volume, the change in dwelling occupancy density (area per person) alters the population density of

the related urban area. This effect comes out as particularly relevant when considering municipal census data: the ever growing percentage of under-occupied public accommodations in Porto exceeds that of the over-occupied ones. However, if ‘area per person’ is considered instead of dwelling type (defined by the number of bedrooms), will the referred municipal accommodations still be regarded as under-occupied? This paper aims at clarifying this question, as municipal housing management policies and distribution are based on dwelling typology.

In order to identify the characteristics of the public housing settlements in Porto from the 1950s and 1960s, an understanding of the public housing context in Porto is needed. A historical overview leads us back to the beginning of the 20th century, although the humanitarian worries about health and salubrity of the working class dwellings had started long before, in the 19th century.

2 Public housing in Porto

2.1 *Historical and political context until the 1980s*

The industrialization process in Portugal caused significant migration to cities during the second half of the 19th century. In Porto this was the main reason for the development of a particular form of housing – the “*ilhas*” (“islands”), mainly of private initiative. Its insalubrity and over occupation, along with the extreme poverty of the resident populations, contributed greatly to disease proliferation, of tuberculosis among others, which emerged as a threat to public health [1]. Though close to 30% of the population of Porto lived in *ilhas* at the end of the 19th century [2], the first social housing initiative in Porto was built in the early 20th century, fulfilling only a very little part of the housing needs of that time. It was therefore during the second decade of the 20th century that the Portuguese Government began to provide economic support to housing, in the aftermath of the demise of monarchy and meeting the republican worries about housing needs. From 1918 till 1933 scarce but interesting urban and residential typological experiences were built, prevailing small multi-storey buildings and single family house typologies, with accurate urban design and planning [3]. After 1935, the Government Central Administration was responsible for building more than 2000 “Economic Houses” in Porto for rent in a “resoluble ownership” scheme¹ [2], which gave tenants the opportunity to become owners by paying a monthly amount (rent) during a 20-year period.

However, it was the “Plan of Improvements for the City of Porto” (*Plano de Melhoramentos da Cidade do Porto*, 1956-66) that set off the construction of many of the public housing complexes to be found in Porto nowadays. Actually, this 10-year plan to build 6000 dwellings (beginning in January 1957) was the sequel to a preceding plan to improve salubrity in *ilhas* – the *Plano de Salubridade das Ilhas do Porto* (1956). The “Plan of Improvements” – that carried out the construction of 6072 dwellings in the scheduled time – was a large scale intervention with considerable urban and social consequences: 15% to 20% of the population living in Porto central area at that time moved to the peripheral “areas of expansion” [2]. Even so, and considering also the 5-year extension, from 1967 to 1971, made to the “Plan of Improvements” (which built only 1674 dwellings from the expected 3000), housing needs persisted.

Among the attempts to face social housing scarcity that followed, particular reference is made to *Serviço de Apoio Ambulatório Local* (SAAL), a program from 1974 to 1976-78 that presented a completely new perspective to the city – a strongly participated mode of building social housing. The

construction of public housing slowed down in the 1980s and 1990s, as the Government changed its social housing strategies, gradually creating legislation to encourage the private sector (increasing private house ownership) and by incrementing Housing Cooperatives investment².

2.2 Legislation and planning restrictions before *RTHS* publication in 1985

In a previous paper [4] the authors presented a chronology of the regulations regarding public housing promotion. Only regulations establishing restrictions to building conception and planning were included. Retrospectively, a synthesis may be focused on the following most relevant legal documents:

- 1951 – *RGEU, Regulamento Geral das Edificações Urbanas* (“General Regulation of Urban Construction”), is the most important legal document to regulate construction activity till today (currently under revision);
- 1975 – *Portaria n.º 449/75*, clarifies the “unique Category” definition, putting it in accordance with *RGEU* (minimum areas);
- 1978 – *IPHPE, Instruções para Projectos de Habitação Promovida pelo Estado* (“Project Instructions for Government Promoted Housing”);
- 1985 – *RTHS, Recomendações Técnicas de Habitação Social* (“Social Housing Technical Recommendations”).

The regulation review reveals that till 1975 the several Classes, Categories and Types for housing promoted by the Government were defined in various Codes and Regulations, which evolved in accordance with the different needs and housing policies, from a national but also local perspective, so as to meet the specificities of the population to be re-accommodated. It may also be concluded that *RGEU* [5] and *RTHS* [6], along with *Portaria n.º 500/97* [7] (which defines area parameters and construction costs), are the regulations to be applied in social housing project conception nowadays.

2.3 Socio-economic context

According to a study based on a municipal census from 1999, published by *Câmara Municipal do Porto* (CMP) in 2001 [2], general indicators show that, besides decreasing, the population in Porto is also getting older. It is also referred that close to 15% of the resident population in Porto live in public housing, occupying more than 45 neighbourhoods and about 13000 dwellings. Furthermore, a great part of the public housing residents in Porto are considered insolvent population, who mostly cannot afford public housing occupancy after rehabilitation, even with subsidies. Another relevant fact is that the percentage of over-occupied accommodations (10%) was then inferior to the ever growing percentage of the under-occupied ones (16.2%). In spite of the conclusions this data can lead to, it is also referred that the socio-urbanistic reality of the inquired housing developments is far from being homogeneous, and that the given indicators do not convey the singularities of some particular situations.

In what concerns social dwelling supply, the national census of 2001 shows that 16% of total housing in Porto was public property [8], which represents a high percentage when considering that in Portugal only 3% of total housing was public property in 2001 [9].

Actually, an understanding of the available possibilities to improve social housing developments in Porto, despite its local specificities, demands a more general integration in national housing strategies. A recent preparatory study to a future “National Housing Strategic Plan” (*Plano Estratégico da Habitação*) originated three documents [10] that give detailed socio-economic information about housing in Portugal. According to this study, in what concerns housing situation, Portugal is much closer to the South European countries than to other Western countries in Europe: the 2001 census shows there were close to 177000 dwellings lacking, while close to 544000 were empty, which leads to the conclusion that dwellings are not balanced enough nor equally distributed, especially if the weak private renting market is considered (usually associated with old urban areas and elderly population).

2.4 Recent municipal strategies for public housing renovation

Concerning municipal strategies for public housing renovation in Porto, till the 1990s there were no maintenance programs applied to social house buildings [2] that naturally became highly degraded. This partly explains why public housing complexes built in Porto in the 1950s and 60s and 70s do not present a satisfactory quality level nowadays. However, in the last few years the city centre of Porto went through a process of large urban regeneration and revitalization, in the context of the nomination of Porto as 2001 European Capital of Culture, which was also an opportunity to set off a municipal housing renovation activity. The renovation strategy is mainly targeted to the technical improvement of housing envelopes (external walls and ceilings), sometimes improving outdoor space, sometimes including accommodation maintenance and rarely addressing interior spatial transformations. However, most of the social housing complexes that were built in Porto, mainly those built by the “Plan of Improvements” (not complying with many of the current living standards and regulations, e.g. ‘standard’ minimum areas) could have been more positively *transformed* if a deeper³ renovation had been considered [4], for which a higher initial investment was required (possibly bringing other long-term benefits).

3 The “Plan of Improvements for the city of Porto 1956-66”

3.1 House buildings general characterization and dwelling guidelines

In order to fulfil the “Plan of Improvements” initial target – 6000 dwellings in 10 years –, the housing planning followed a preliminary detailed study (financial but also social), based on inspections of the living conditions of the families to re-accommodate.

Building conception had to be highly optimized regarding the global cost/total number of dwellings ratio, for which site plan strategies and local traditional construction methods were also recommended. A municipal publication from 1966 [11] shows the areas that were considered for the different dwelling Types (T1, T2, T3 and T4, depending on the number of bedrooms) of three distributive schemes contemplated for the elected typology: multi-storey buildings (ground floor plus 3 floors). As referred by Portas [12], the housing typologies built by the commonly called *Plano das Ilhas* “(...) achieved the lowest «standards» ever practiced in [Portuguese] economic housing (50 m² for Type 3/6 occupants), rising again, shortly afterwards (...)” in a subsequent intervention in Lisbon within a different legislation context.

D.L. n° 40 616 from 1956 (that published the “Plan of Improvements for the City of Porto”) establishes the dispositions buildings should obey. Following the article 6 of this legislation, building project-type conception should also regard (between others) the applicable dispositions of *RGEU* from 1951, though not compromising the “(...) rigorous economical conditions to achieve the controlled rent aim.” [13].

3.2 Minimum area analysis

Minimum “habitable area” values can be compared, though *RGEU* prescribes separate compartments for the kitchen and living-room while the “Plan of Improvements” includes a kitchenette in the living-room area.

It was not possible to find a common “gross area” value for comparison (as *RGEU* provides minimum values for “gross area” and “habitable area”, while the “Plan of Improvements” presents “habitable area” and “usable area” values). Consequently, the maximum value for “usable area”/“gross area” ratio established in *RTHS* was applied, in order to find acceptable “gross area” values for comparison.

Table 1 collects data regarding minimum and maximum area analysis. The comparative analysis suggests that the average areas established for the “Plan of Improvements” dwellings are above the minimum values established in *RGEU*.

Table 1: Comparative analysis between: dwelling minimum areas in *RGEU*; dwelling maximum areas in *RTHS* (Port. 580/83); dwelling areas in “Plan of Improvements”

Dwelling type / Maximum occupants	unit	T1 _{/2}	T2 _{/4}	T3 _{/6}	T4 _{/7}
<i>RGEU</i> , 1951 (active legislation)*					
Minimum Gross Area (GA)	m ²	52	72	91	105
Minimum Habitable Area (HA)	m ²	30.5	43.5	54.5	61
“Plan of Improvements”, 1956					
Minimum Habitable Area (HA) (kitchenette)	m ²	24	32	42	48.5
Usable Area (UA) average** (kitchenette)	m ²	32.4	40.2	50.6	61.1
Gross areas (GA) comparison					
Minimum (<i>RGEU</i> , 1951)	m ²	52	72	91	105
Maximum (<i>RTHS</i> , Port. 580/83, 1983)	m ²	65	85	100	114
Maximum (<i>RTHS</i> , Port. 828/88, 1988; Port. 500/97, 1997)	m ²	65	85	105	114
Estimated Gross Area (“Plan of Improvements”, 1956) (estimated GA = UA x 1.33) ***	m ²	43.1	53.5	67.3	81.3

(*) *RGEU* is under revision; minimum areas increase is expected in revised code (**) Average areas from different dwelling types/distributive schemes in a *CMP* publication from 1966 (***) Following *RTHS* (Port. 580/83, cf. 4.2.1.2.), the GA/UA ratio for multi-storey housing should not exceed 1.33

4 *Bairro Rainha D. Leonor*: municipal housing in Porto under renovation

4.1 *Original project (1951-53) and ongoing renovation (2005-...)*

The municipal housing complex *Rainha D. Leonor* in Porto was built in two different phases: the first ended construction in 1953 (150 dwellings, low-density two-storey house typologies), and the second in 1956 (100 dwellings, high-density multi-storey house typologies). As other social housing examples built before 1956, *Rainha D. Leonor* was part of a municipal strategy to re-accommodate population from housing with no salubrity conditions, a kind of pilot-project for the “Plan of Improvements” [14].



Figure 1: General view of the ongoing renovation works on *Bairro Rainha D. Leonor* in Porto

This paper focuses only on the first housing development (1951-53) of 150 dwellings, the only example of municipal housing under “deeper renovation” that was found in Porto. When the present ongoing renovation is finished, the original 150 dwellings will be reduced to 90. Buildings deep renovation and dwelling typology enlargement (by merging the original typologies) was part of the competition program, as well as the maintenance of the original architectural character of the two-storey houses and the demolition of illegally constructed annexes. Authored by *Inês Lobo Arquitectos Lda.*, the renovation project from 2005 worked out a careful typological transformation, as illustrated in Fig. 1 and Fig. 2.

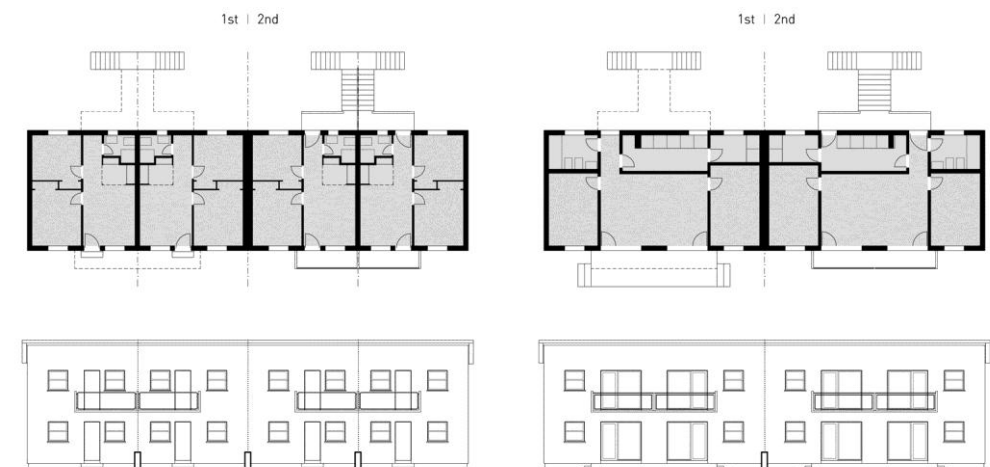


Figure 2: Left: set of four original Type 2 (8xT2) houses. Right: renovation proposal typology (4xT2)

4.2 Typological transformation: area analysis

The areas of the new dwelling typologies are now in accordance with current regulations. Nevertheless, and despite the fact that the new dwelling typologies duplicate the area of the original ones, their gross area is only slightly over the minima defined in *RGEU*. House unit quantification, dwelling typology and minimum/maximum areas are compared and analysed in Table 2.

According to available information, the original project submission (for obtaining the construction license) dates from January 1951, while *RGEU* dates from August 1951.

Table 2: Comparative analysis: original vs. new dwelling typology gross areas

	BEFORE RENOVATION			AFTER RENOVATION		
	Un.	Gross Area (m ²)*		Un.	Gross Area (m ²)*	
House “units”	90			90		
Dwellings	150			90		
Type 2 house (T2 _{/4})	88	37.0	72 (min: RGEU) 85 (max: Port 500/97)	44	(T2 _{/4}) 74.0	72 (min: RGEU) 85 (max: Port 500/97)
Type 3 house (T3 _{/5})	32	45.5	91 (min: RGEU) 105 (max: Port 500/97)	16	(T3 _{/6}) 91.0	91 (min: RGEU) 105 (max: Port 500/97)
Type 4 house (T3 _{/6})	30	55.3	91 (min: RGEU) 105 (max: Port 500/97)	30	(T1 _{/2}) 55.3	52 (min: RGEU) 65 (max: Port 500/97)

* Due to the unusual social housing typology (low-density two-storey houses), dwellings gross area quantification considered construction volume and did not consider “dependencies area” (as paved garden common area, exterior stairs or balconies). *Rainha D. Leonor* is in fact one of the few two-storey housing examples of municipal property in Porto.

4.3 Typological transformation: occupancy density analysis

Since original dwelling typologies are merged to give place to new typologies, the population density of the related area is reduced. Density measures the number of persons per unit area. Thus, for the same construction volume, the change in dwelling occupancy density (area per person) alters the population density of the related urban area, as analysed in Table 3.

Table 3: Comparative analysis: original vs. new dwellings capacity (maximum occupants)

	BEFORE RENOVATION				AFTER RENOVATION			
	Un.	Cap.	max occup.	m²/occup.	Un.	Cap.	max occup.	m²/occup.
Dwellings	150				90			
Type 2 house (T2 _{/4})	88	4	352	9,3	44 (T2 _{/4})	4	176	18.5
Type 3 house (T3 _{/5})*	32	5	160	9.1	16 (T3 _{/6})	6	96	15.2
Type 4 house (T3 _{/6})*	30	6	180	9.2	30 (T1 _{/2})	2	60	27.7
Occupancy (average)	692 (÷ 150 = 4,6)**			332 (÷ 90 = 3,7)				
Population density	692 ÷ 2,9 ha = 239			332 ÷ 2,9 ha = 114				

(*) Variation in the T3 dwelling typology capacity is due to the bedroom area: a T3 may have 1 double room plus 2 twin rooms, or alternatively, 1 double room, 1 twin room and a single room (**) The original project (1951): 4,5 persons/dwelling (average), probable population of 675 inhabitants in 2.9 hectares (population density = 233 inhabit/ha)

If ‘area per person’ (occupancy density) is considered instead the number of bedrooms (dwelling typology), then, the original municipal accommodations in *Rainha D. Leonor* were very probably *over-occupied*, and despite the decrease in population density (from 239 to 114 persons per hectare), for the same construction volume, only after renovation these dwellings are *adequately* occupied.

The change in density effect comes out as particularly relevant when considering municipal census data: as already referred in Section 2.4, the ever growing percentage of under-occupied public accommodations in Porto exceeds that of the over-occupied ones. However, considering the number of dwellings built by the “Plan of Improvements” and its subsequent 5-year extension (6072 plus 1674 dwellings), and following Table 1, a great part of the existing social dwellings in Porto⁴ do not comply with nowadays ‘standard’ minimum areas (among other current regulations and living standards). If this is the case, are all the under-occupied municipal accommodations *really* under-occupied, or is it possible that part of these are actually occupied by an *adequate* number of residents, if the dwellings area is considered?

5 Final considerations

The existing municipal dwellings in Porto do not present equivalent characteristics. The correct relation of municipal housing management and distribution policies to dwelling typology is therefore an important question, suggesting criteria revision. A considerable number of municipal accommodations in Porto, in particular those built by the “Plan of Improvements”, due also to their extremely reduced area, could be more positively transformed as in the case of the *Rainha D. Leonor* housing. A diagnosis study should be performed before renovation to evaluate the adequate level of intervention.

This study is part of the ongoing PhD research by Joana Restivo. The analysis of the reference case presented in this paper is being extended to other case-studies in Porto.

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¹ In a “resoluble ownership” scheme (*fórmula de propriedade resolúvel*) tenants become owners only after a pre-defined tenancy period. This was a sort of “mixed tenure housing scheme” but more limited (as typically, in a “mixed tenure housing scheme” one might be able to buy outright, rent, or opt to part buy property on a ‘shared ownership’ basis with the provider).

² Though private house renting legislation was not referred, it was partly responsible for the ever growing gap between rent and property values since the 1940s till the 1980s. This fact increased not only tenants “protection” but also private renting buildings degradation, today affecting many main city centres in Portugal.

³ By “deep” the authors mean a more “intensive” level of the intervention, beyond its physical extent. Within this perspective, the higher this level becomes, the more positively transformation occurs.

⁴ One housing development from “Plan of Improvements” has been partly demolished. However, many social dwellings built before 1956, which present dwelling areas inferior to those of “Plan of Improvements”, would increase the referred number.