REVISTA Ação Ergonômica

R. Ação Ergon., 19(1), 2025.
ISSN 2965-7318. doi: 10.4322/rae.v19n1.e202507.en

ANALYSIS OF FLOOR PLANS OF POPULAR HOUSING COMPLEXES FROM THE PERSPECTIVE OF NBR 15575/2023 AND ORDINANCE 269/2017 OF THE MINISTRY OF CITIES

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Summary

The research evaluated how the floor plans of housing complexes within the Minha Casa Minha Vida program conform to the parameters of NBR 15575 (ABNT, 2023) and the guidelines of Ordinance No. 269/2017, subsequently created by the Ministry of Cities. Three developments that predate this standard were examined: Parque da Lagoa and Parque Paraíso, in Blumenau, Santa Catarina; EHIS Jardim Navegantes, in Porto Alegre, Rio Grande do Sul; and Residencial Pitangueiras, in São Luís, Maranhão. The study followed a qualitative approach, seeking to understand, primarily, how the spaces were organized, how circulation occurs, and how furniture was distributed. To this end, the methodology involved digitizing the floor plans of the analyzed developments in AutoCAD software, followed by normative verification and comparative analysis. The results revealed only partial adherence to the normative parameters, highlighting deficiencies such as narrow corridors, lack of specific storage areas, and inadequacies in both social and private spaces. In the adapted units, accessibility flaws were particularly evident, limiting their full functionality. Although some solutions reveal attempts to improve spatial efficiency and ensure greater safety, several obstacles persist and end up compromising residents' daily lives and activities. The study reinforces the need for greater ergonomic considerations in housing design, promoting adjustments that improve comfort, well-being, and efficiency. Even in projects designed before current regulations, rigorous application of technical standards can significantly transform the quality and inclusion of housing.

Keywords: Ergonomics of the Built Environment, Social Housing, Accessibility, Functionality, Comfort.

1. INTRODUCTION

In order to combat the housing deficit and boost the economy amid the global economic crisis, in 2009, the Federal Government launched the Minha Casa Minha Vida (MCMV) program, which in 2020, after a change in the Federal Government, was renamed Casa Verde e Amarela, and in 2023, it returned to being called the Minha Casa Minha Vida program (Ministério Das Cidades, 2023; Ferreira & Warszawiak , 2021).

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The Minha Casa Minha Vida program was created to facilitate access to housing for families with a monthly income of up to R$12,000.00 (Brasil, 2025). It is divided into income brackets, which determine the financing conditions and subsidies available (Caixa Econômica Federal, nd). The MCMV program opened new avenues for real estate financing and individual housing credit, especially for families with moderate incomes, leveraging public subsidies and facilitating large-scale housing production (Eskes & Vieira, 2016; Lima, 2024).

The program is a large-scale Brazilian government initiative aimed at providing affordable housing. In this context, housing ergonomics is essential to ensuring that residential spaces are safe, comfortable, and accessible, promoting well-being and autonomy for all residents. When combined with technical standards and regulations, such as NBR 15.575/2023 - Performance of Housing Buildings - (ABNT, 2023) and Ordinance 269 of the Ministry of Cities (2017), the architectural design can meet requirements of functionality, durability, and accessibility, ensuring quality throughout the building's lifespan.

Ordinance 269 of the Ministry of Cities (2017) defined a minimum standard for buildings designated for the Minha Casa Minha Vida Program (PMCMV), establishing minimum areas — 36.00 m² for units with external service areas and 38.00 m² for those with internal service areas — and requiring furniture compatible with these dimensions, in accordance with NBR 15575-1 (ABNT, 2023).

In this context, Rangel and Matos (2018) emphasize that meeting technical requirements must be complemented by universal design and environmental comfort guidelines to ensure that spaces are accessible and comfortable for a diverse population, including people with disabilities and the elderly. This approach broadens the role of regulations, as it not only defines dimensional parameters but also guides solutions that promote autonomy and usability in everyday life.

Recent research has examined how these housing units meet ergonomic needs, focusing on aspects such as accessibility, comfort, and interaction between residents and their living spaces. Understanding the ergonomic qualities and limitations of these dwellings is essential to improving residents' quality of life. According to Amorim et al. (2015), studies indicate that priority has often been given to mass production of housing units, neglecting essential aspects of habitability, functionality, and privacy.

Assessments of residential units and projects under the MCMV program frequently identify serious functionality issues, primarily limited to reduced usable area and poor space

distribution (Barcelos & Brandão, 2017; Sousa & Porangaba, 2024; Souza & Almeida, 2020). These limitations compromise comfort, habitability, and the ability of housing to meet users' needs. Several studies indicate that small changes in the geometry and shape of living areas can significantly improve the functionality and environmental comfort of MCMV housing, but limited area is a recurring obstacle.

Barcelos and Brandão (2017) concluded that the projects analyzed, which were carried out in the state of Mato Grosso for the Minha Casa Minha Vida Program, did not prioritize quality, despite the requirements of universal design. Sousa and Porangaba (2024) found several design problems related to functionality and accessibility, mainly when analyzing adapted and adaptable housing units in a property in the state of Sergipe, while Souza and Almeida (2020) identified similar problems in a project in the state of Maranhão.

According to Rangel and Matos (2018), the lack of adequate furniture aggravates ergonomic problems, hindering users' comfortable interaction with the environment. Poor organization of environments hinders circulation, the efficient use of spaces, and the adaptation of homes to family routines (Piazza, 2019; Villa et al., 2016).

Studies such as those by Piazza (2019) and Villa et al. (2016) show that small changes in the geometry and shape of living spaces can significantly improve the functionality and environmental comfort of MCMV housing, but limited space is a recurring obstacle. Understanding users' needs and their challenges with space and furniture is crucial to more effective design.

In the field of ergonomics, Dul and Weerdmeester (2012) advocate adapting the environment to the physical, cognitive, and sensory characteristics of users, while Iida and Buarque (2016) emphasize the importance of appropriate anthropometric measurements, especially in environments such as kitchens, where forced postures and poorly planned spaces increase the risk of accidents. Kroemer and Grandjean (2005) reinforce that dimensions, lighting, indoor climate, and physical effort must be adapted to human capabilities to prevent discomfort and fatigue. Franz (2024) emphasizes that environmental perception is an essential part of comprehensive ergonomics, as layouts that ignore users' sensory and functional experience tend to generate fragmented solutions.

These ergonomic principles, when applied to the architectural design of social housing, guide the creation of safe, comfortable, and accessible spaces for different types of residents. In Brazil, parameters such as those established by NBR 15575:2023—which defines performance requirements for residential buildings—and Ordinance No. 269/2017—which sets

minimum standards for area, furniture, and accessibility for MCMV projects—serve as normative references for aligning ergonomic guidelines with technical requirements, ensuring functionality and inclusion from the project's inception.

Thus, the objective of this work was to analyze floor plans of three popular housing complexes in light of NBR 15575/2023 and Ordinance No. 269/2017, identifying inadequacies that affect habitability, functionality and privacy, and verifying the degree of compliance with normative parameters before their validity.

2. METHODOLOGY

This study adopted a qualitative, exploratory, and descriptive approach (Gil, 2002; Creswell , 2007) to evaluate the compliance of floor plans of three social housing complexes with the standards NBR 15,575 (ABNT, 2023) and Ordinance No. 269/2017 of the Ministry of Cities (Brazil, 2017). The analysis focused on habitability, functionality, and privacy, comparing developments designed before and after the enactment of Ordinance No. 269/2017.

2.1. Sample and Selection Criteria

Three projects from the Minha Casa, Minha Vida Program were selected, located in Blumenau (SC), Porto Alegre (RS) and São Luís (MA), considering:

- Regional diversity;
- Projects developed in different urban contexts;
- Availability of detailed floor plans and additional technical information.

It is worth highlighting that all the projects analyzed were designed before the publication of Ordinance No. 269/2017, which allows us to retrospectively assess the degree of compliance of these projects with the technical parameters that would be required later.

2.2. Analysis procedures

To assess the compliance of floor plans with technical regulations, a systematic approach was adopted based on three main steps: (1) preparation and standardization of plans, (2) detailed regulatory verification and (3) comparative analysis between projects.

Initially, the floor plans provided by the projects were digitized in a CAD (Computer-Aided Design) environment, using reference measurements (such as door openings and wall

thicknesses) to ensure dimensional accuracy. This step allowed for the standardization of graphic representations and the correct interpretation of scales.

Subsequently, a normative assessment was carried out, comparing the dimensions of the environments, furniture and circulations with the minimum requirements established by NBR 15.575 (2023) and Ordinance No. 269/2017. Criteria such as:

- Minimum areas of rooms (bedrooms, bathrooms, kitchen);
- Circulation widths and accessibility;
- Functional arrangement of furniture (beds, cabinets, benches);
- Spatial sectorization (division between intimate, social and service areas).

Finally, the third stage consisted of a comparative analysis of the projects, aiming to identify patterns of compliance and non-compliance, observing the extent to which projects prior to Ordinance No. 269/2017 already met—or failed to meet—the regulatory criteria established therein. The findings were organized into comparative tables, enabling a critical assessment of the design quality of social housing.

Therefore, the analysis consisted of verifying the dimensions of the redesigned plans, comparing the measurements obtained with the minimum parameters established by NBR 15575:2023 (ABNT, 2023) and by Ordinance No. 269/2017 of the Ministry of Cities, making it possible to objectively identify the environments that met and those that did not meet the normative requirements.

3. RESULTS AND DISCUSSION

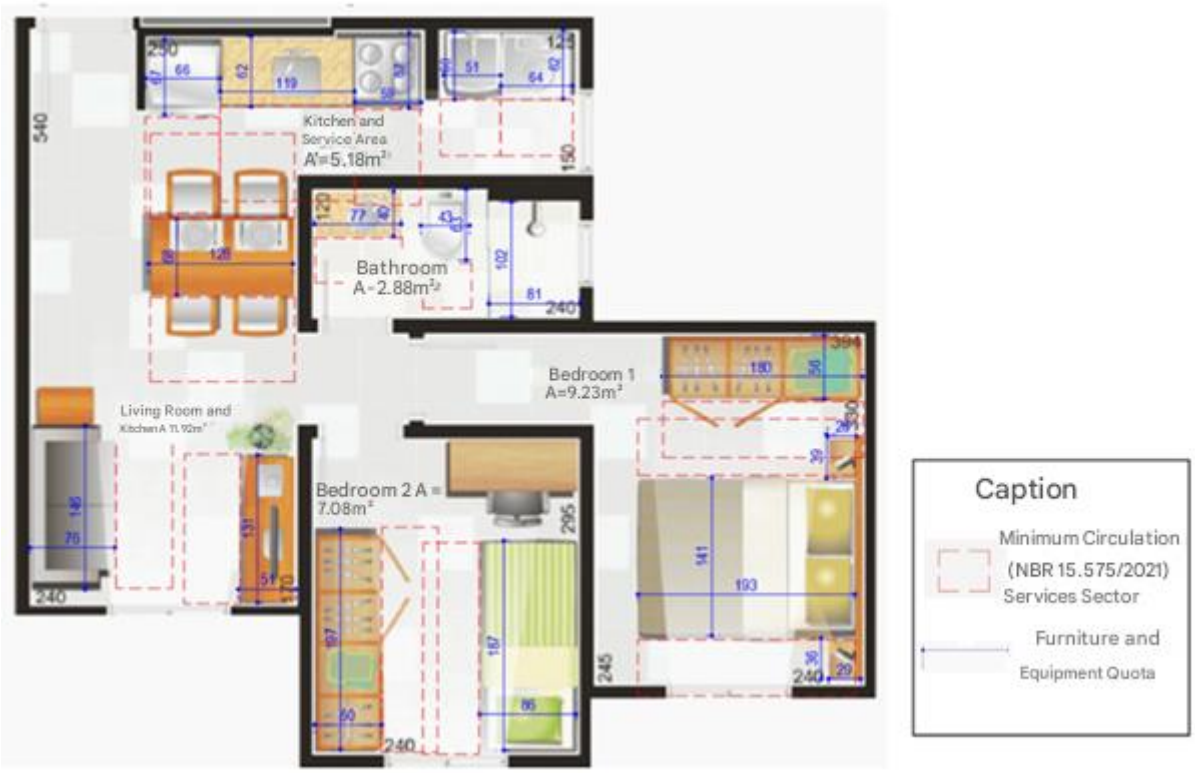
Social Housing (HIS) plays a fundamental role in promoting the right to decent and affordable housing, governed by specific guidelines that ensure comfort, safety, and functionality for its occupants. In Brazil, regulations such as NBR 15.575/2023 and Ordinance No. 269/2017 of the Ministry of Cities establish criteria for the sizing of spaces and furniture, as well as minimum requirements for internal circulation. These specifications are essential to ensure the functionality of housing, especially in projects developed under programs such as Minha Casa Minha Vida (MCMV).

3.1. Lago Park and Paraíso Park Residential Complex - Blumenau/SC - 2010-2011

Figure 1 shows the minimum recommended dimensions for furniture and internal circulation parameters according to NBR 15.575/2023. These data serve as a reference for

analyzing the layout of housing units, allowing us to verify whether the designed spaces meet the needs of residents and comply with the requirements established by the regulations, identifying possible inadequacies and proposing improvements to ensure greater quality and comfort in housing.

Figure 1: Assessment of furniture dimensions and minimum circulation area



Source: Modified from Peixer, 2014.

Analysis of the floor plans of the affordable housing complexes, specifically the Parque da Lagoa and Parque Paraíso Residential Complexes, highlighted important aspects related to functionality, comfort, and regulatory compliance. Although the layouts are based on the needs plan recommended by the Minha Casa Minha Vida (PMCMV) Program—including a living room, two bedrooms, a bathroom, a kitchen, and a laundry room—significant challenges were identified in fully meeting the guidelines of NBR 15.575/2023 and Ordinance No. 269/2017 of the Ministry of Cities.

The usable area of the housing unit, at 36.19 m², is 0.81 m² below the minimum established by the Municipality of Manaus (PMCMV), indicating a potential compromise in the use of space. Although the sectorized areas follow the classic division (social, private, and

service sectors), the reduction in circulation areas, especially in areas such as bedrooms and kitchens, compromises functionality and safety. This factor is critical, considering that, according to Palermo (2009), functionality and proper operation of spaces are essential in Social Housing (HIS) projects.

In the service sector, the presence of a partition between the kitchen and laundry room was a positive aspect, allowing for simultaneous use of both spaces. However, the lack of storage areas and the lack of space for equipment such as microwaves and clotheslines compromise the practicality of daily activities. Although these items are not explicitly required in the Ministry of Cities' minimum specifications, their inclusion is essential to meet residents' basic needs.

Analysis of the bedrooms revealed that the space designed for two people in the smaller bedroom is only viable with the use of bunk beds or trundle beds. However, this solution compromises the minimum circulation required by NBR 15.575/2023, resulting in inadequate space utilization. Furthermore, the living room layout failed to meet PMCMV specifications, which require a sofa sized for the total number of beds. Limiting the space to a two-seater sofa does not meet this guideline, compromising the functionality of the space.

Inspection of the furniture dimensions indicated general compliance with the minimum specifications of NBR 15.575/2023, with minor discrepancies attributed to scale adjustments in the analyzed floor plan. However, the reduced circulation area in several rooms represents a significant challenge. This limitation directly impacts residents' mobility, increasing the likelihood of obstructions and accidents, especially during busy periods.

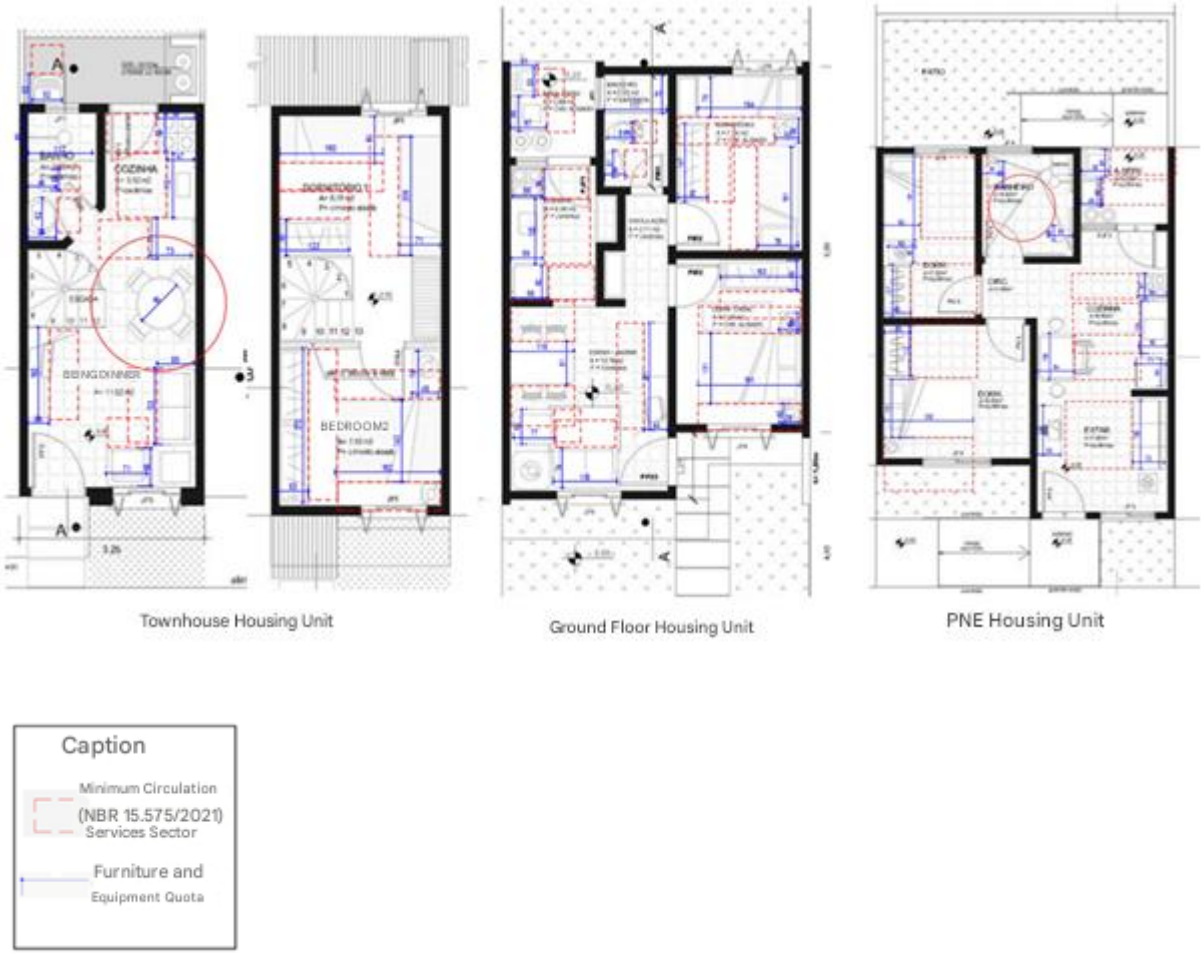
Given these results, the importance of careful architectural planning for HIS projects stands out. Strict application of regulations is essential to ensure safe, functional, and comfortable housing. It is recommended that future projects consider layout adjustments to expand circulation areas and include adequate space for storage and essential equipment. These measures are essential to ensure that housing fully meets residents' needs, promoting quality of life and safety.

3.2. EHIS Jardim Navegantes – Porto Alegre/RS - 2008

The results of the analysis of the floor plans of the EHIS Jardim Navegantes development reveal positive and negative aspects regarding compliance with the requirements of NBR 15.575/2023 and Ordinance 260/2017 of the Ministry of Cities. Figure 2 presents the

minimum dimensions of the furniture and the circulations established by the standard, used as a basis for evaluating the functionality and comfort of the three housing typologies: townhouses, single-story houses, and units adapted for people with disabilities (PwD).

Figure 2: Assessment of furniture dimensions and minimum circulation area



Source: Modified from Monteiro; Mirror, 2016.

In all three typologies, the spaces are organized in a classic way, with clearly defined social, service, and private areas. The separation between the laundry room and kitchen allows for simultaneous activities, but the laundry room's location outside the units creates discomfort, especially during the winter and at night. This problem is exacerbated in the two-story house type, which lacks adequate space for a washing machine, representing a serious non-compliance with the Ministry of Cities' specifications. Additionally, none of the typologies offer storage space for groceries and cleaning products, nor specific accommodations for appliances such as microwaves, compromising the functionality of the service areas.

In the social sector, the living rooms of all three types lack sufficient seating for the number of beds required, violating the Ministry of Cities' minimum comfort specifications. Another critical point is the misalignment between the TV cabinet and the upholstery in the two-story and ground-floor types, which hinders comfortable use of this space. The dining table area also presents circulation restrictions, especially during busy periods in the residence, compromising the operation of this space in everyday situations.

In the private area, the analysis identified significant inadequacies. In the two-story and two-story typologies, the bedrooms for two people lack nightstands, an item considered essential by the Ministry of Cities' specifications. In the PwD unit , the nightstand was inappropriately positioned at the foot of the bed, making it unusable. A critical problem identified in the two-story typology is the lack of partitions and doors in one of the bedrooms, which compromises the privacy and functionality of the space, an essential requirement for housing intended for family use.

An analysis of accessibility aspects reveals that units adapted for people with disabilities have adequate circulation areas in some areas, but are restricted in others, such as laundry rooms and bedrooms. These areas do not meet the minimum 150 cm diameter requirement for circulation in front of furniture and equipment, hindering the independence of users with reduced mobility. This problem is also highlighted by the presence of spiral staircases in townhouse units, which, although not prohibited by regulations, can pose an accident risk for children, the elderly, or people with limited mobility.

Overall, the results indicate that the project partially meets regulatory requirements, but presents flaws that compromise residents' comfort, safety, and accessibility. These inadequacies highlight the importance of reviewing and improving floor plan planning in affordable housing, ensuring that regulatory guidelines are fully met and that the spaces meet families' real needs.

3.3. Pitangueiras Residential – São Luís/MA - 2015

The results of the analysis of the floor plans of the Pitangueiras Residential Complex, composed of multifamily housing buildings, reveal a functional organization, although it presents limitations in relation to the parameters established by the Minha Casa Minha Vida Program and NBR 15.575/2023. Each building has four floors and eight housing units per floor, totaling 864 units in the development. With a usable area of 36.54 m², the units have less square footage than required by the housing program, which poses challenges in furniture arrangement

and internal circulation, as illustrated in Figure 3, which shows the minimum furniture dimensions and circulation recommended by the standard.

Figure 3: Assessment of furniture dimensions and minimum circulation area.

Source: Modified from Souza; Almeida, 2020.

The internal layout of the housing units reflects the classic sectorization of affordable housing developments, with one social sector, three service sectors, and two private sectors. Despite the reduced square footage, the partial integration between the kitchen and laundry room promotes simultaneous use of these spaces, a positive feature. However, the lack of specific areas for storing groceries and appliances such as microwaves compromises the functionality of these areas, standing out as a significant limitation. In the dining and bathroom service sectors, all regulatory requirements were met, except for the minimum circulation required in the dining room, which is affected by the furniture arrangement. Small adjustments to the position or layout of the furniture could resolve this limitation.

In the social area, the living room does not meet the minimum seating requirements for the number of beds in the units, as required by the Ministry of Cities, which affects the comfort and usability of the space. In the private areas, the absence of nightstands was observed in the master and twin bedrooms, contradicting the minimum requirements of Ordinance 260/2017. Furthermore, the left side of the bed in the master bedroom does not have the minimum circulation recommended by NBR 15.575/2021, even though the furniture size exceeds the normative values, indicating an inefficient use of the available space.

The analysis of the circulation areas shows that, with the exception of specific areas, such as the dining room and master bedroom, the areas meet the minimum requirements of the standard. No significant discrepancies were detected between the specified furniture dimensions and the normative values, which reinforces the adequacy of the representations used in the project. Correctly sized blocks provide future residents with a realistic view of the space, contributing to a better understanding of the functionality of the housing units.

Although Residencial Pitangueiras presents challenges related to space utilization and full regulatory compliance, its compliance with most requirements demonstrates a concern for the functionality and efficiency of the units. The project plays a crucial role in meeting the housing demand in the São Luiz region by offering affordable housing that, despite its limitations, ensures safety and practicality for residents. The combination of compliance with technical standards and the functional adjustment of interior spaces positions the project as a relevant solution in the urban context, contributing to local housing development and improving the quality of life of the population served.

3.4. Comparison and discussion between projects in compliance with Ordinance No. 269/2017

A comparative analysis of the three housing projects - Parque da Lagoa/Parque Paraíso (Blumenau, Santa Catarina, 2013), EHIS Jardim Navegantes (Porto Alegre, Rio Grande do Sul, 2008), and Residencial Pitangueiras (São Luís, Maranhão, 2020) - reveals common patterns of partial compliance with the parameters established by NBR 15575/2023 and Ordinance No. 269/2017, even in projects developed before the latter came into effect. Table 1 summarizes the main criteria evaluated in the projects; this systematization allows for a critical assessment of the qualitative evolution of housing projects in the context of social housing.

Table 1: Comparison between projects analyzed regarding regulatory compliance and functionality, based on Ordinance No. 269/2017 and NBR 15575/2023

Criterion	Lagoa Park / Paradise (Blumenau/SC, 2010-2011)	EHIS Jardim Navegantes (Porto Alegre/RS, 2008)	Pitangueiras Residential (Saint Joseph of Ribamar/MA, 2015)

Project year	2010-2011 (pre-Ordinance No. 269)	2008 (pre-Ordinance No. 269)	2015 (pre-Ordinance No. 269)
Usable area of the unit	36.19 m²	42.25 m² (two-story houses); 44.62 m² (ground floors); 49.50 m² (PcD)	36.54 m²
Service area	Internal with partition	External in all types	Partially integrated into the kitchen
Accessibility (PwD)	Standard units without adaptation; limited circulation	2 units adapted for PcD ; not compliant with NBR 9050 (faults in the turning area and furniture)	Adapted unit; partially compliant with NBR 9050, with restrictions in the laundry room and bedroom
Internal circulation	Insufficient sleeping and living space	Restricted to dining room and bedrooms; conflicts with furniture	Slightly higher; some points with obstructions
Storage spaces	Present, but insufficient and inadequate to the needs of residents	Present, but not functional for everyday demands	Gifts, but limited and not very adaptable to family needs
Compliance with NBR 15575	Partial	Partial	Partial, with better graphic and dimensional adequacy
Furniture represented	Imprecise scales; generic blocks	Misalignment between furniture and layout	Blocks represented according to technical standards
Seats compatible with beds	Does not meet (undersized sofa)	Does not meet the requirements (sofas not sized for the number of beds)	Does not meet (two-seater sofa only)
Functional sectorization	Classic, with circulation conflicts	Classic, but with interference in circulation and privacy	Classic, more coherent and functional

Source: The authors, 2025.

In addition to the comparative analysis presented in Table 1, Table 2 was created to directly relate the projects analyzed in this study to findings from previous research. This

summary allows us to objectively visualize which problems identified in the literature were also observed in the cases analyzed, highlighting the persistence of certain design flaws over time and in different regional contexts.

Table 2: Relationship between literature studies and analyzed projects

Study of literature	Problem identified	Undertaking of the present study that presents the same problem	Evidence in the present study
Piazza (2019)	Insufficient circulation and use of bunk beds in small dormitories	Lagoon Park / Paradise Park	Smaller bedroom only accommodates two people with a bunk bed/trunk bed, compromising circulation
Sousa and Porangaba (2024)	Insufficient turnover areas in adapted units	EHIS Jardim Navegantes	Turnover areas less than 150 cm in laundry rooms and PcD bedrooms
Souza and Almeida (2020)	Lack of bedside tables and insufficient seating	Pitangueiras Residential	No bedside tables in bedrooms and only a two-seater sofa
Barcelos and Brandão (2017)	Incompatible layout and furniture, compromising functionality	All ventures	Various conflicts between circulation and furniture in social and intimate areas

Source: The authors, 2025.

The convergence between the results of this study and those of previous research (Piazza, 2019; Sousa & Porangaba, 2024; Souza & Almeida, 2020) highlights that problems such as insufficient circulation, undersized furniture, and a lack of storage space remain recurring challenges in Brazilian public housing. These patterns manifest themselves regardless of region or construction period, suggesting the need for revised design guidelines and greater oversight of regulatory enforcement.

A comparative evaluation of the three housing developments — Parque da Lagoa/Parque Paraíso (Blumenau/SC, 2013), EHIS Jardim Navegantes (Porto Alegre/RS, 2008), and Residencial Pitangueiras (São Luís/MA, 2020) — reveals a heterogeneous scenario in relation to compliance with the parameters subsequently established by Ordinance No. 269/2017. Although all were conceived before the regulation came into effect, it is observed that some design aspects already anticipated, albeit partially, the guidelines that would be formalized.

Regarding dimensional adequacy, the three developments have usable areas close to, but slightly below, the minimum 36 m² required for units with an external service area. EHIS Jardim Navegantes stands out for offering a variety of typologies (from 42.25 m² to 49.50 m²), indicating a preliminary concern with diversifying housing profiles. However, even in the larger units, functional limitations persist, corroborating the premise that spatial quality is not limited to metric dimensions, but to the efficiency of the layout and integration between spaces (Piazza, 2019).

The spatial organization predominantly follows the tripartite model (social, intimate and services), but with different performance in each case:

- Parque da Lagoa/Parque Paraíso: Although it maintains a clear sectorization, circulation between spaces is compromised by the lack of passageways, especially in the bedrooms.
- EHIS Jardim Navegantes: Presents privacy problems in bedrooms due to the lack of partitions in some typologies, in addition to conflicts between furniture and circulation.
- Residencial Pitangueiras: Demonstrates greater functional coherence, but still faces challenges such as overlapping uses in reduced areas, a phenomenon already documented by Villa et al. (2016) in studies on social housing.

Regarding accessibility, the projects fail to fully meet the requirements of NBR 9050, even in the supposedly adapted units. The EHIS Jardim Navegantes, for example, has insufficient turning areas in laundry rooms and bedrooms, while the Residencial Pitangueiras lacks adequate transfer areas in the adapted bathrooms. Such inadequacies reinforce Rangel and Matos' (2018) criticism of "superficial inclusion" in HIS projects, in which accessibility is treated as a formal requirement but not as an integrated design principle.

Regarding the furniture, a significant evolution is observed: while the Jardim Navegantes EHIS still features generic blocks that are misaligned with the layout, the Pitangueiras Residential complex now features more precise dimensions, reflecting greater technical rigor. However, neither development fully meets the requirement for seating commensurate with the number of beds, indicating a persistent gap between regulations and design practice.

Finally, the analysis of the service areas shows that solutions such as the external laundry room (EHIS Jardim Navegantes) generate thermal discomfort, while the partial integration with the kitchen (Residencial Pitangueiras) represents a functional improvement. The lack of dedicated storage spaces, common to all three cases, corroborates the need to review

the minimum standards, which still neglect the daily demands of users (Souza & Almeida, 2020).

4. CONCLUSION

This study demonstrates that, although the projects analyzed were conceived before Ordinance No. 269/2017 came into effect, some already incorporated—albeit partially—principles that would later be standardized. However, compliance with technical requirements remains fragmented, with occasional advances in spatial efficiency and graphic representation, but persistent deficiencies in accessibility, ergonomics, and adaptation to user needs.

The results indicate that simply expanding areas or adopting sectorized models alone does not guarantee the functionality of the units. Problems such as restricted circulation, inadequate furniture, and lack of storage space are recurrent, reflecting a design approach that prioritizes economic optimization over housing quality. This trend, already criticized by authors such as Barcelos and Brandão (2017), persists in housing that, although formally adequate to minimum standards, fails to offer full comfort and usability.

The comparative analysis also reveals that regulatory developments, while necessary, are not sufficient to overcome structural deficiencies in HIS projects. Ordinance No. 269/2017 represents progress by establishing clearer parameters, but its effectiveness depends on a paradigmatic shift in the design of spaces—which must transcend meeting isolated requirements and adopt a comprehensive view of residents' needs.

As recommendations, it is suggested:

- Review of storage and furniture criteria in regulations, incorporating real demands identified in post-occupancy assessments;
- Integration between accessibility and universal design from the initial stages of the project, avoiding superficial adaptations;
- Adoption of ergonomic guidelines that consider the diversity of family profiles and daily activities.

Regarding the study's limitations, the analysis focused on three projects, which represents a small sample. However, regional diversity and careful selection provide qualitative representation for the proposed objectives. The lack of on-site technical visits was mitigated by

cross-validating the plans with official documents and previous studies, ensuring the reliability of the analyzed data.

In addition to the findings, it is important to recognize the limits and scope of this research in order to contextualize the validity of the findings and guide future work. In summary, the findings of this study reinforce the importance of housing policies that combine technical rigor with design innovation, ensuring that social housing fulfills its role not only as physical units but also as spaces that promote quality of life and socio-spatial inclusion. Future research could expand this analysis by incorporating mixed methods and direct comparison with previous studies on HIS, strengthening the scientific basis for normative recommendations and more effective design practices.

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Received: 14/08/2025
Approved: 12/08/2025

Executive Editor: Italo Neto