



Apartment Design with *an Inclusive Design Approach* in East Jakarta

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ABSTRACT

The rapid population growth in East Jakarta has created an urgent need for decent and affordable vertical housing. This research aims to design flats with an inclusive design approach to accommodate a diversity of users, including the elderly, children, and people with disabilities. The methods used include literature studies, location surveys in Pondok Bambu Village, precedent studies, and site and regulatory analysis. The results of the design show that the application of the principles of universal accessibility, adaptive spatial zoning, integration of social facilities, and optimization of KDB, KLB, and KDH regulations are able to create humane, efficient, and sustainable housing. This approach not only answers the need for vertical housing, but also forms an inclusive and socially just environment.

INTRODUCTION

Jakarta as a center of national growth faces serious challenges in the provision of housing due to the increase in population and limited land. East Jakarta is recorded as the area with the highest population in DKI Jakarta, which has an impact on the low rate of home ownership and the increasing need for affordable housing. Vertical housing is a strategic solution in answering urban land limitations. However, the construction of flats is not enough to be only oriented towards space efficiency, but must be able to accommodate the diversity of users. In this context, the inclusive design approach is relevant because it seeks to create an environment that can be used by everyone without discrimination in age, physical ability, or social background.

This research aims to design flats in Pondok Bambu Village, East Jakarta, by applying inclusive design principles to create housing that is accessible, adaptive, and supports social interaction and environmental sustainability. Jakarta, as the capital city of Indonesia, has a big challenge in meeting the needs of decent housing for its residents. With a growing population, Jakarta has become a city with a very high population density. Based on data from the Central Statistics Agency (BPS), the population of DKI Jakarta in the 2nd semester of 2024 will reach 11,038,216 people. This figure does not include the number of people living in the Greater Jakarta area, which can be more than 30 million people. This increase in population has an impact on the increasingly urgent need for housing, and one of the proposed solutions is the design of flats.

Kab/Kota	Persentase Rumah Tangga yang Menempati Bangunan Tempat Tinggal Milik Sendiri menurut Kabupaten/Kota di Provinsi DKI Jakarta (Persen)	
	2022	
Kep Seribu		85,50
Jakarta Selatan		51,38
Jakarta Timur		47,79
Jakarta Pusat		46,79
Jakarta Barat		54,52
Jakarta Utara		50,48
DKI Jakarta		50,67

Keterangan Data :
Sumber: Survei Sosial Ekonomi Nasional (SUSENAS), BPS

Figure 1. Percentage of People who do Not Own a House in Jakarta

LITERATURE REVIEW

Vertical Dwellings and Flats

Vertical housing is a multi-storey settlement solution to optimize urban land use. Based on Law Number 20 of 2011, flats are multi-storey buildings that are divided into residential units that can be owned or used separately with shared parts. The most common form of vertical housing in Indonesia is flats. It can be concluded from these two words, vertical housing is a dwelling that is arranged in tiers or perpendicular to the earth's surface.

Inclusive Design Concept

Inclusive design is a design approach that removes physical, social, and psychological barriers so that space can be accessed and used by all groups. Its main principles include:

- a. Universal accessibility, Ensures all areas are accessible to everyone, including wheelchair users, the elderly, children, and people with visual or hearing impairments.
- b. Flexibility of use, Space should support a wide range of user preferences and capabilities.
- c. The design is simple and intuitive, The design should be easy to understand, regardless of the user's experience, knowledge, or ability.
- d. Fault tolerance, Design should minimize potential harm and negative consequences due to user error.

This approach goes beyond meeting technical standards and puts human diversity at the heart of design.

METHODOLOGY

This research uses a qualitative-descriptive approach based on architectural design with the following stages:

- a. Literature Studies
Examine the theory of vertical housing, apartment regulations, and inclusive design principles.
- b. Location Survey
The location is on Jl. Laksamada Maeda, Pondok Bambu Village, East Jakarta, with a land area of ± 2 hectares. The analysis includes transportation accessibility, infrastructure conditions, zoning regulations, and environmental potential.
- c. Preliminary Study: Aquarium Susun Village, Productive Susun Kampung Grow Cakung.
- d. Site Analysis and Regulations, Site Selection in East Jakarta, especially in Pondok Bambu Village, for the design of flats with an inclusive design approach is very appropriate because this area faces a high housing need in line with rapid population growth and urbanization. Pondok bambu is an area that has social, cultural, and economic diversity, so that inclusive apartment design can meet the needs of various groups, including people with disabilities, the elderly, and families with children. In addition, Pondok Bambu has good transportation accessibility, adequate basic infrastructure, and the potential for the development of green open spaces and environmentally friendly public facilities. The construction of flats here can also improve the quality of life of the community, encourage local social and economic development, and support government policies in providing affordable and inclusive housing for all levels of society.



Figure 2. Location Site

The design location is in Pondok Bambu Village, East Jakarta, with a land area of ± 2 hectares ($\pm 20,000 \text{ m}^2$). The area includes high-density residential zones and has direct access to the collector's road network as well as surrounding public facilities. Spatial planning provisions KDB 55%, KLB 3.6, KDH 20%. Based on physical, social, and regulatory analysis, the site has the potential to greatly support the development of inclusive design-based flats. The strategy of mass orientation, cross ventilation, vegetation buffer, and circulation separation are the basis for designing vertical dwellings that are not only spatially efficient, but also responsive to the comfort and diversity of users.

e. Formulation of Design Concepts

Integrating universal design, land efficiency, sustainability, and strengthening social spaces.

RESEARCH RESULTS

The Application of Accessibility Principles is the Main Basis in Building Configuration

This strategy is not only limited to the provision of physical elements such as ramps and elevators, but is designed as an inclusive circulation system from the early stages of design.

- a. Provision of universal standard ramps and elevators throughout the building's main access.
- b. The width of the corridor is at least 110 cm to allow two-way movement.
- c. A disability-specific housing unit is placed on the ground floor to facilitate evacuation and mobility.
- d. A minimum swivel radius of 150cm in a given space to accommodate a wheelchair.

As a result, the entire main line of the building can be used without segregation between residents with disabilities and non-disabled residents. This approach creates an equal and non-discriminatory spatial system.

Mass Composition Concept

The mass configuration of the building is designed in the form of symmetrical blocks to improve the efficiency of the structure and ease of spatial orientation. The orientation of the masses extends north-south to maximize natural lighting and minimize exposure to overheat.

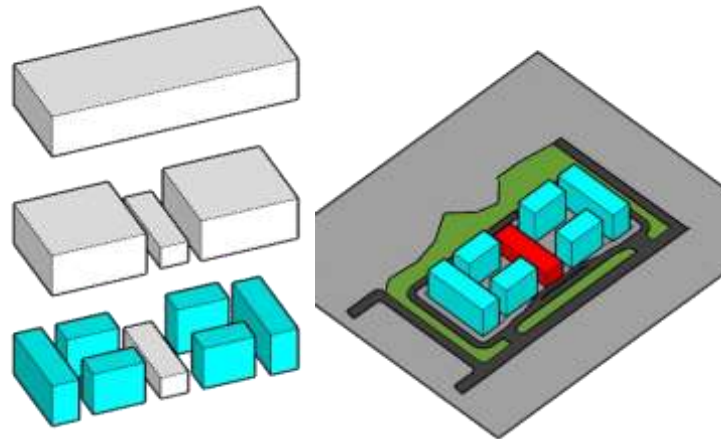


Figure 3. Composition Concept

Social Space Integration

The design results show that the integration of social space is an important element in supporting the sustainability of vertical communities. The ground floor functions as a transition space between public and private spaces with the provision of:

- a. Green open space (20% KDH)
- b. Children's play area
- c. Community space every 3 floors
- d. Productive business areas

Optimization of Building Regulations and Capacity

With a land area of $\pm 20,000 \text{ m}^2$ and a KLB provision of 3.6, the total potential building area reaches $\pm 72,000 \text{ m}^2$. The utilization of these regulations is optimized through efficient vertical development, without sacrificing green open space. KDB 55% allows a built-up footprint area $\pm 11,000 \text{ m}^2$ on the ground floor, so that the remaining land can be used as open space and water catchment areas. This supports the balance between building density and environmental quality.

Environmental Sustainability Strategy

The sustainability approach is applied through the integration of passive and active systems, including:

- a. Natural cross ventilation for improved thermal comfort.
- b. Optimization of natural lighting to reduce energy consumption.



Figure 4. Lighting Concept

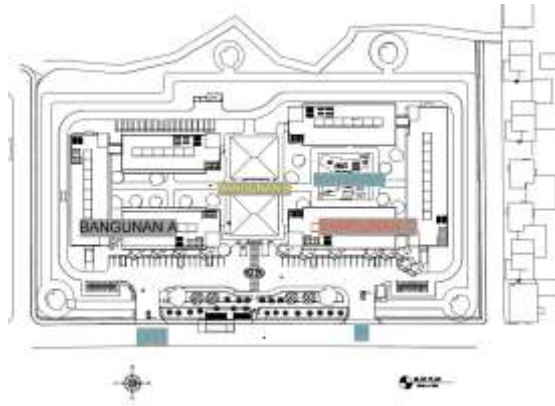


Figure 7. Zoning

Climate Analysis and Thermal Comfort

Based on the climate analysis on the site, the orientation of the mass is directed to maximize cross-ventilation and reduce overheating. The cross openings on the unit allow for natural airflow thus increasing the thermal comfort of the occupants. In addition, the use of shading and overhangs on the façade serves to control the intensity of light without reducing the natural lighting in the room.



Figure 8. Application of Facades and other Temperature Regulators

Evaluation of Inclusive Design Implementation

The inclusive design approach is applied comprehensively in the spatial and circulation system. The implementation can be seen in the dimensions of the corridor that allow wheelchair maneuvering, the minimal difference in floor level, and the provision of integrated elevators and ramps.

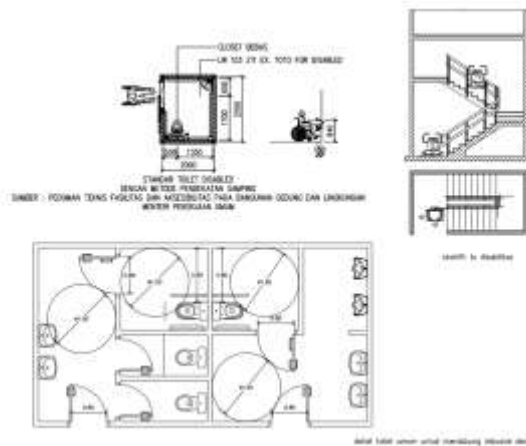


Figure 9. Implementation of Inclusive Design

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the design and discussion, it can be concluded that the *inclusive design approach in the design of flats in East Jakarta is able to answer the problem of vertical housing in densely populated areas more comprehensively.*

First, the north-south oriented mass composition strategy has proven to be responsive to tropical climatic conditions. The application of cross ventilation and solar radiation control through façade elements passively increases thermal comfort and has the potential to reduce building energy consumption.

Second, the implementation of vertical zoning based on the characteristics of occupant mobility shows effectiveness in creating an adaptive housing system. The division of floors based on mobility levels does not cause social segregation, as it remains integrated through communal spaces spread across several floors.

Third, the implementation of the principle of inclusive design is not only realized through the provision of accessibility facilities such as ramps and elevators, but also through the dimensions of space, circulation systems, and flexibility of residential units. This shows that inclusivity can be applied as a holistic design approach, not just the fulfillment of technical regulations.

Thus, this study emphasizes that vertical housing that is designed in an inclusive manner is able to improve the quality of space, comfort, and equal access for all residents.

Based on the results of the research and design that has been carried out, there are several recommendations that can be considered for further development:

1. Development of *Post-Occupancy Evaluation Study*, Further research needs to be conducted to evaluate the effectiveness of the implementation of inclusive design after the building is occupied, so that empirical data can be obtained regarding user comfort and ease of access.
2. Integration of Inclusive Housing Planning Policy, local governments can consider the implementation of inclusive design standards as part of apartment planning regulations, not just as an additional accessibility requirement.

3. **Strengthening Energy Sustainability Aspects**, Further development can integrate renewable energy systems such as solar panels or rainwater treatment systems to improve building operational efficiency.
4. **Replication of the Concept in Other Urban Areas**, this design model has the potential to be applied to other dense urban areas with similar characteristics, especially areas with limited land and high density.
5. **Deepening the Social and Economic Aspects of Residents**, the next research can examine the social and economic impact on the residents of inclusive flats, in order to see the extent to which design affects the quality of life of the community.

ADVANCED RESEARCH

The next research can be directed to the implementation of post-occupancy evaluation to assess the effectiveness of the implementation of inclusive design more comprehensively. This evaluation aims to measure the extent to which the design concept that has been applied is able to improve the quality of life of residents, both in terms of physical comfort, ease of access, security, and satisfaction with the residential environment. Quantitative approaches through structured surveys and measurement of building performance indicators can be used to obtain measurable and objective data. Thus, the results of the study are not only conceptual, but also supported by empirical evidence that shows the real impact of the implementation of inclusive design on the welfare of the residents of flats.

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