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Behavior Approach to the Design of Low-Income Community Flats in Cilangkap

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ABSTRACT

The need for decent housing in Jakarta, especially for Low-Income people will be very urgent because of the increasing population living in the city of Jakarta. The growing population does not allow to accommodate it with a system of landed houses. Therefore, it is necessary to provide vertical housing that can accommodate housing needs for residents who need a place to live. So that the DKI Jakarta Government is trying to build a Simple Owned Flat in the Cilangkap area, East Jakarta. In contrast to landed houses, vertical housing problems such as flats are quite complex, including a group of people from various backgrounds gathered in one vertical concept residential building, land use problems that are not only used for the benefit of flats, but also used as a recreational arena for local communities, transit points for Transjakarta buses, and rainwater reservoirs from local settlements because the land is lower than the surrounding environment. The urgent thing in the design of this flat is the accommodation of various backgrounds of residents, therefore the design of this flat uses a behavioral approach. Thus, this design is expected to be more targeted to people in need.

Keywords: Behavior , Architecture , Flats, Cilangkap .

1. Introduction

Flats are vertical residences that are used for residential facilities that can accommodate many people. Various kinds of educational background, ethnicity, and character of the residents gathered into one in it. Flats are very often found in big cities in Indonesia, especially Jakarta because the vacant land is getting narrower and the price of housing and vacant land is no longer affordable for the middle to lower income people. As long as there is life and birth, the need for adequate housing will always exist. So far, flats are a solution that is able to answer the problem of housing needs in big cities, especially Jakarta, which is still affordable.

According to Law. No. 20 of 2011, Flats are multi-storey buildings that are built in an environment which is divided into functionally structured parts, both horizontally and vertically and are units, each of which can be owned and used separately, especially for a residential area equipped with shared parts, shared objects, and shared land.

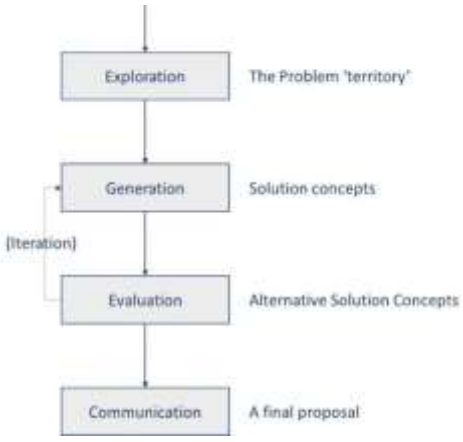
The Regional Public Company Pembangunan Sarana Jaya has an obligation to meet the housing needs of its people, therefore the Government seeks to develop housing vertically, namely the Simple Owned Flats in Cilangkap. Simple flats are intended for low and middle to lower income people. It is hoped that this apartment can meet the need for decent housing around the design location and improve the environmental quality of the city of DKI Jakarta, especially around the Cilangkap sub-district area.

Limited land is one of the challenges for the Government in providing housing facilities. So a reasonable solution is to build vertical housing or flats. Therefore, the flat which is located in Cilangkap District is expected to remain optimal in meeting the needs of the occupants by way of structuring the building mass that takes into account the conditions, the surrounding environment, the configuration of the space in the building as well as the designation or function of the space in the building.

2. Materials and Methods

The design process consists of 4 parts, namely the exploration stage, generation stage, evaluation stage and design communication. These stages are based on the method of Nigel Cross (1984).

In the exploration stage, the scope of the problem raised is explained. In this study, exploration is limited to the environment around the flats, including the shape of the land, the circulation of roads around the land and the conditions of the surrounding environment. In the second stage, generation is the definition of alternative concepts at the exploration stage that have been formulated. At this stage, what is done is to understand the study of theory and literature related to design to produce an initial concept.



Source: (Cross, 1984)
Figure 1Process Design of Nigel Cross (1984)

The third stage is evaluation, which is a test step whether the concepts that have been used have met the criteria or not, so that they can return to the generation stage if they need to refine the concept. At this stage, design criteria have emerged resulting from the research discussed from the generation stage. At the communication stage, it aims to describe the results of the concepts generated and applied to images.

Below is a description of the City Plan (KRK) in accordance with the Spatial Plan and Zoning Regulations. This Zoning Regulation is contained in the DKI Jakarta Provincial Regulation Number 1 of 2014 Article 1 Point 22 which describes the Zoning Regulation which is a provision that regulates the use of space and elements of control that are arranged for each designated zone in accordance with the detailed spatial layout. The use of this zoning map is as a guide for designers to design buildings according to local regulations. The shape of the land is narrowed at the entrance, and in the middle that connects the front and rear land. The land on the southeast side is narrow. On the east side there is land that is separated by an access road to the place beside it.

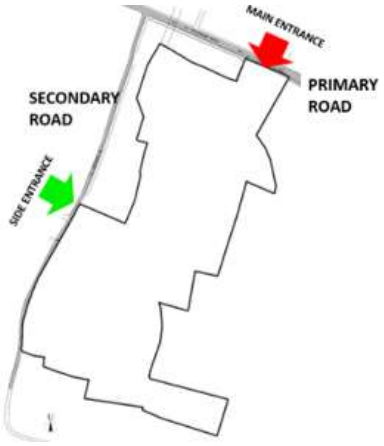
Source: (DPMPTSP DKI JAKARTA, 2019)
Figure 2KRK Flats Cilangkap

3. Results and Discussions

3.1. Exploration

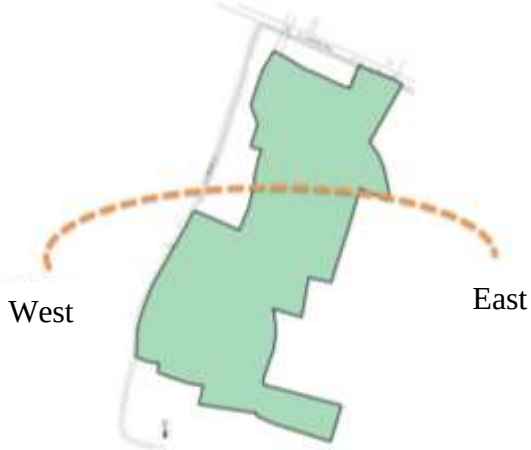
In the Site Plan planning, it is necessary to pay attention to environmental conditions, topography, thermals, government regulations and also community culture. The function of the building is also a major consideration in the formation of the site plan, especially in the laying of the building mass. When the building is used as a residence, it needs a location that is a bit far from the noise of motorized traffic. While buildings that are commercial in nature, must be located closer to the highway, because it is related to service and profit orientation. This is intended to create a comfortable and safe living environment for residents.

Cilangkap highway is the main road that will be used to access the Flats area. Therefore, the main access to the Flats is on the Cilangkap Highway. Public transportation facilities on the Cilangkap highway are very adequate such as city transportation, Transjakarta buses, online taxis, etc. So that the residents of the flats can easily go to/from a place. Besides being on Cilangkap,highway there is a second entrance on Sepakat IX road on the west side of the land. The second entrance also makes it easier for the residents of this flat to access residential buildings.



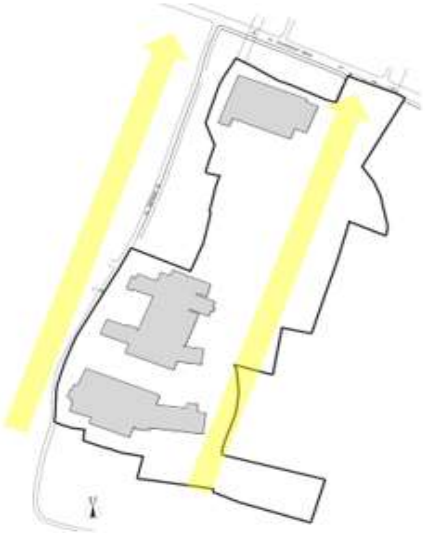
Source: (Majora,2019)
Figure 3 Access to Land

After determining the entrance to the site, the next step is to determine the configuration of the building on the site. Determination of the mass configuration of this building aims to find a good position of the building according to environmental conditions in terms of human needs and sun orientation. Because the Flats functioned as residential buildings, it is very important to pay attention to the arrangement of the building mass against climatic conditions. This is influential and closely related to the arrangement of space in the building.



Source: (Majora, 2019)
Figure 4 Orientation Sun

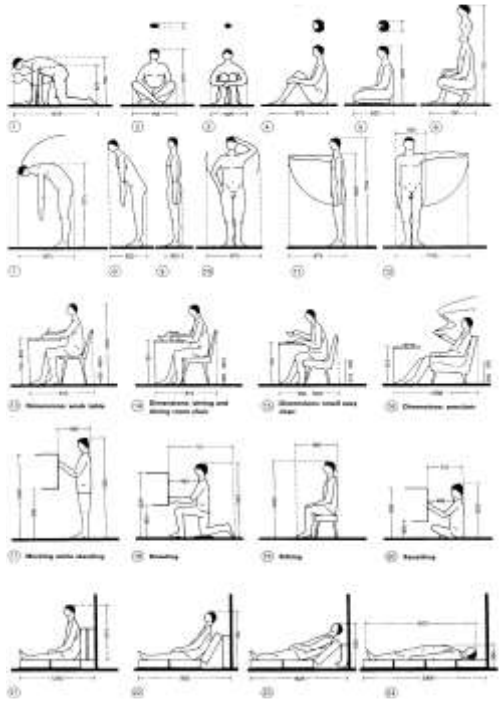
Next is to determine the pattern of the building mass. Based on the mass study and land analysis, the optimal orientation of the building is to the north and south. This aims to avoid direct sunlight exposure from the west-east direction. After determining the position of the mass of the building, the next step is to design the circulation in the land, how effective and efficient circulation is for the residents of the flats and for public transportation vehicles that are provided with bus stops on the site that make it easier for the residents of the flats not to leave the land to look for public transportation.



Source: (Majora, 2019)
Figure 5 Orientation Building

Next is the analysis of the prospective occupants of the flats, including their daily activities as office workers and odd jobs. To define the area of occupancy space/flat unit, it is necessary to know the average dimensions of a person when carrying out activities. This is done to determine the minimum dimensions of the desired space. Next is the dimensions of the vehicles that will be around the flats, including motorbikes, cars, fire trucks, medium-sized Transjakarta buses. The building module follows the standard unit of measure in spatial planning and building structure. The modules used in spatial planning and building structures include:

1. Human activity/movement unit module
2. Space unit module (combination of activity units)
3. Structure and construction module



Source: (Ching, 2007)
Figure 6 Dimension Activity Man

This motion activity module also affects the comfort of building users in the space provided. Each room must meet standards so that residents can move comfortably. The comfort of the occupants does not only depend on the standard of the space provided, the available facilities also play a role in it. Complete facilities are able to provide additional options for residents to choose not to leave the apartment area to just look for outside facilities that are already available in the area.

After receiving discretion from the DKI Jakarta Government, which was originally only 12 floors, this flat can reach a total of 24 floors. The two floors below, namely the ground floor and the 2nd floor have a function as a public and service zone or podium with an area of the ground floor is 1820 m2, while the 2nd floor is 1600 m2. Where on the ground floor there is a retail food court, funeral home, and Mechanical Electrical room, motorbike and bicycle parking lots, several slots for parking for four-wheeled and disabled vehicles also equipped with hardstanding for the needs of fire engines, on this floor also provides Kindergarten as a facility to support educational needs for children under 6 years old. The second floor has a play area, roof garden, food stall, prayer room, hall and meeting room, but on the second floor there is also a residential zone with separate access.

Table 1Space Requirement

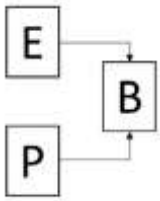
NO	SPACE REQUIREMENT
1.	Units Room
2.	Shared Room
3.	Management Room
4.	Management Unit Office flat
5.	Funeral Room (including room cruising)
6.	Business unit
7.	Electrical Panel Room
8.	Garbage Room and Janitor
9.	Plumbing Shaft
10.	Vehicle Parking (motorcycle)
11.	Passenger Elevator
12.	Goods Elevator
	In Building
	a. Pre-function room
	b. Multipurpose Room
	c. Kindergarten room
	d. Management Room
	e. Health Center
	f. Public Toilet

Source: (Majora, 2019)

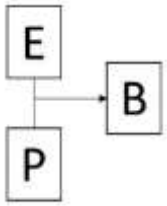
3.2. Generation

The approach used is behavioral, because it involves many people from various backgrounds. According to Charles Jencks (1971) in a pluralist society, architects are required to recognize various conflicts and be able to articulate the social sphere of every human being in any particular social situation. At this stage the surrounding environment plays an important role in shaping human behavior. This is related to the study of behavior-environment, where the relationship between behavior and the environment is related to the transformation process and to the mechanism of human relations with all the environments involved in the process. According to Kurt Lewin quoted from the book Architecture of Human Behavior (Laurens, 2004), he has formulated that behavior (B = behavior) is a function of a person's personal circumstances (P = person) and the environment in which the person is located. (E = environment) becomes $B=f(P,E)^1$. Subsequent developments emerged cognitive psychology theory, namely the relationship E (Environment) and P (Person) in

the process of human cognition process is getting more attention.



Source: (Majora, 2022)
Figure 7 Effect of E and P on B . respectively



Source: (Majora, 2022)
Figure 8 Effect of E and P on B

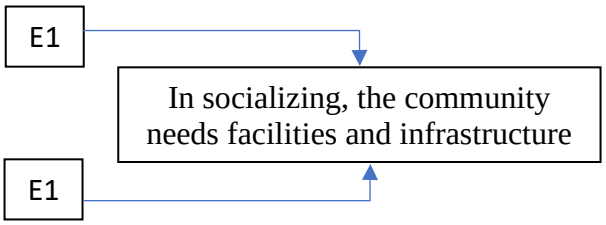
The schematic above shows the relationship between elements E (environment), P (people), and B (behavior) based on cognitive psychology theory. The scheme above is the basis for how to find the concept that will be applied to the design of this Cilangkap Flats.

Next, determine the formulation of elements E and P, each looking for a population character around the site. By observing for several days at the planning land location, the following samples were produced:

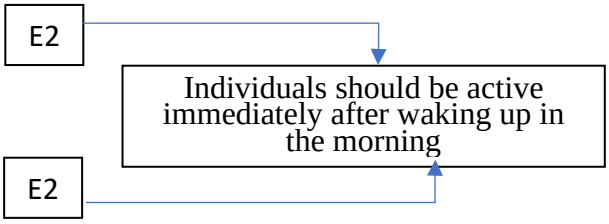
Element E (environment):
1. Tolerance-friendly social environment
2. Environment with a very high work orientation
3. High mobility environment

Element P (person):
1. Residents who like to use vehicles to go somewhere
2. Individualistic residents
4. residents who rarely do activities at home

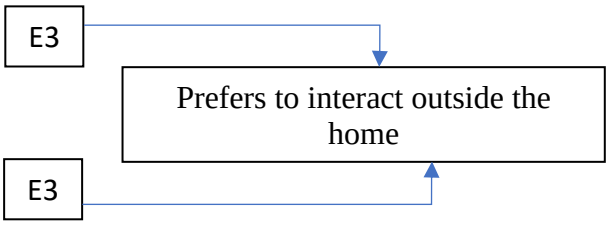
To formulate B (behavior) it takes 2 elements E and P that have been determined, each of these elements defines 3 characteristics of residents around the site. To formulate each sample for each element, that is by giving the code behind the element called according to its number, for example, element E followed by sample number 1 means it becomes E1, so it can be formulated as follows:



Source: (Majora, 2022)
Figure 9 Classification B (behavior) 1



Source: (Majora, 2022)
Figure 10 Classification B (behavior) 2



Source: (Majora, 2022)
Figure 11 Classification B (behavior) 3

3.3. Evaluation

From the behavioral formulation above, 3 points are generated that can be taken into consideration for designing architectural concepts, the 3 points are
1. In socializing, people need facilities
2. Residents immediately start their activities after waking up in the morning
3. Prefers to interact outside the home

From the 3 points above, the next step is to determine the architectural concept, namely:

Table 2 Formulation

Behavior Identified	Concept
In socializing, people need facilities	1. Provide access in the form of a pedestrian path 2. Provide a location at a certain point to be used as a place to socialize

	3. Provide a location for public transportation within the area 4. Friendly to pedestrians and cyclists 5. Easy access for parking especially two-wheeled vehicles
Residents immediately start their activities after waking up in the morning	1. Increase the opening so that it can provide fresh air into the flat 2. Easy access to parking locations 3. Provide space that is used as a place of business
Prefers to interact outside the home	1. Provide a space that functions as an interaction on each floor 2. Adding facilities in the form of lots of green open space 3. Added a playroom for kids

Source: (Majora, 2022)

3.4. Communication

At this communication stage, it is to apply the concept to the design so as to produce a design that can accommodate or change the behavior of the use of this flat.

1. Providing access for pedestrian paths.

Source: (Majora, 2019)
Figure 12Pedestrian Path

2. provide a container at a certain point to be used as a place to socialize

Source: (Majora, 2019)
Figure 13 Corner interaction

3. Provide a place for public transportation in the area

1.

Source: (Majora, 2019)
Figure 14 Stop as transportation transit location general

The stop location is located near the main gate to enter the flat area, because it makes it easier for public transportation to reach it, and residents from inside and outside the area can easily access it.

4. Friendly to pedestrians and cyclist

Source: (Majora, 2019)
Figure 15Pedestrian friendly

Providing pedestrian access along the flat area, thus providing a sense of security for pedestrians.

4. Easy access for parking, especially for two-wheeled vehicles

Source: (Majora, 2019)
Figure 16Motorcycle parking locations

Ground floor

Fully functional for retail rooms, security rooms, public toilets, Mechanical Electrical rooms, and health centers, funeral rooms, motorcycle parking and bicycle parking. This floor zone is referred to as the public space zone because most of the available space is a public service and can be accessed and used by all residents of the flat.

Source: (Majora, 2019)
Figure 171st floor

2nd floor

It is used as a public space and also a private zone that functions as a residence. This zone can be reached by using an elevator as well as stairs. However, for access to the residential zone, a passenger lift is available that can be accessed by residents up to the residential unit. The public zones located on the 2nd floor are: Kindergarten, Playroom, Community Hall, and Prayer Room.

Source: (Majora, 2019)
Figure 18 2nd floor

3rd floor

On this floor the rooms have been devoted to typical residential units. This residential unit has 2 types of residential units, namely studio type and 2 bedroom type (2 Bedroom). With extensive; Studio type with an area of 19.2 m2, and Type 2 Bedroom with an area of 29.6 m2. With a total of 39 units on this floor (24 Studio units and 15 2 Bedroom units). To be able to access can use the stairs and elevator. A passenger lift is provided for easy access.

Source: (Majora, 2019)
Figure 193rd floor

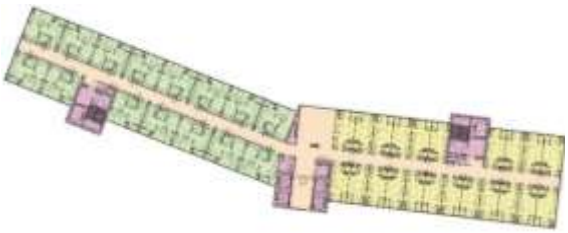
Floor 4 (Typical)

On this floor the rooms have been devoted to typical residential units. This residential unit has 2 types of residential units, namely studio type and 2 bedroom type. With the following areas: Studio type with an area of 19.2 m2, and Type 2 bedroom with an area of 29.6 m2. With a total of 39 units on this floor (24 units of Studio type and 15 units of 2 Bedroom type).

Source: (Majora, 2019)
Figure 204th-typical floor

Typical floor(every 3 floors)

On this floor the rooms have been devoted to typical residential units. This residential unit has 2 types of residential units, namely studio type and 2 bedroom type. With the following areas: Studio type with an area of 19.2 m2, and Type 2 bedroom with an area of 29.6 m2. With a total of 37 units on this floor (22 units of Studio type and 15 units of 2 bedroom type). On this floor there is a common room for gathering.



Source: (Majora, 2019)
Figure 215th - typical floor

The following is an arrangement for the interior of the apartment living room. Which consists of a Studio unit with an area of 19.2 m2, in the room it can be seen that there are sufficient openings in the form of windows and doors leading to the balcony. So that the air will be guaranteed rotation in the room.

Source: (Majora, 2019)
Figure 22Plan type 1

Then the second type is Type 2 bedrooms with an area of 29.6 m2. Each bedroom has an opening. Likewise in the family room so as to ensure cleanliness and air quality in the room

Source: (Majora, 2019)
Figure 23Plan type 2

4. Conclusion

The need for housing is an urgent matter. The conclusion obtained is that the design should always pay attention to the needs of the occupants and the state of the surrounding environment. Flats for low-income people have

a concept that accommodates the needs of residents. By providing shared needs on the 1st and 2nd floors, such as motorcycle ownership, it is accommodated by providing parking spaces with a 2:1 ratio, in the sense that 1 motorcycle unit is for 2 apartment units. The ground floor also provides a health center, funeral home, kindergarten. On the 2nd floor also provides public space. For the private zone starting on the 3rd floor and above. Every 3 floors provide a common space for residents to gather to socialize with each other.

Acknowledgment

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