Application of Behavioral Architecture in The Land Arrangement of a Simple Rental Flat, Bong Cino Tomb Area, Madiun City

Rifo Ibnu Falah[1a*], Firdha Ayu Atika[2a], Failasuf Herman Hendra[3a]

[a] *Department of Civil Engineering, Faculty of Civil Engineering and Planning, Institut Teknologi Adhi Tama Surabaya*

Abstract. The city of Madiun is currently experiencing an increase in population with various backgrounds. Based on the description of the problem, a long-term plan is needed to anticipate the population's need for housing. There is a problem that is in the spotlight, namely residents who build homes on the slum land of the Bong Cino Cemetery area and have occupied the area for tens of years with the nature of activities that are contrary to the norm. In the problems that have been described, it is necessary to plan and design flats for residents in the Bong Cino Cemetery area by applying a behavioral architectural theme to be able to communicate with users through sensing the buildings that affect human psychology. The types of research conducted are field studies and literature studies. In collecting data using interview methods, observation methods, documentary methods, and literature methods as well as the types and sources of data used are primary data and secondary data. From the discussion of the problems, it can be concluded that designing the low-cost flat building, namely focusing on land management by applying the concept of macro-defensible space which is applied to land planning, produces a role in the mechanism of action prevention for environmental protection and is expected to be of assistance and benefit to the community and to be able to overcome problems in the Bong Cino Tomb area.

Keywords: Behavioral Architecture, *Defensible Space*, Madiun City, Bong Cino Cemetery, Simple Rental Flat

1. Introduction

The development of Simple Rent Flats is currently carried out by the Government which is authorized by the Ministry of Public Works and Public Housing PUPR in the process. In the construction of simply rented flats by the 2020-2024 RPJMN, the government is targeting that in 2024 as many as 70 per cent of households will occupy decent housing either with direct government intervention or indirect intervention.

Currently, the City of Madiun is experiencing an increase in population with various backgrounds. However, it is associated with issues that will be discussed in planning and design or become the spotlight, namely residents who live around 60 heads of families in the area or land of the Bong Cino tomb area, which is better known as the Chinese tomb in Madiun City, which has occupied for tens of years with the nature of conflicting activities. according to norms, the land area of the tombs has excessive area, the existence of tombs that are not taken care of, and the assets of the Madiun City Government that are not functioning properly.

With the problems that have been described, in the Bong Cino Cemetery area, Madiun City, the facilities for housing needs and problems are still not seen as a problem. Based on the Madiun City Government Program in the Bong Cino Cemetery area, a flat will be built which will be implemented starting in January 2022. From the problems in the research and the alignment of the plans of the Madiun City Government, building simply rented flats is an effective solution by considering the aspects of development that have been determined and helped overcome problems with land management in the Bong Cino Cemetery area, Madiun City. The design implements a behavior-oriented architecture as an architecture whose application includes behavioral considerations with the design. The application of the concept of macro defensible space for land management, which results in a role in the mechanism of action prevention for protecting the environment and is expected to be of assistance and benefit to the community and to be able to overcome problems in the Bong Cino Cemetery area.

The research carried out can be part of a more comprehensive arrangement to reduce urgency because of the increasing population and fulfilment of housing needs in the future, benefiting people who need it, and preventing actions for protecting the environment in the Bong Cino Cemetery area, Madiun City. In addition to the residents who occupy the Bong Cino grave area, people with economic strength are also given priority, including data on low-income people and Integrated Social Welfare Data based on 2022 data on who can occupy the building. Therefore, applying the theme to the building, namely behavior-oriented architecture, and the application of defensible space, is expected to solve the problems described earlier.

2. Theoretical Framework

2.1 Behavioral Architecture

Behavioral architecture is an architecture that in its application always includes behavioral considerations in the design of behavioral links with architectural design (as a physical environment), namely that architectural design can be a facilitator of behavior or vice versa as a barrier to behavior (JB. Watson, 1878-1958). Coverage in behavior includes visible behavior such as eating, cooking, sitting and so on. Invisible behavior such as fantasy, motivation and so on and behavior that shows humans in their actions or activities. The relationship between behavior and the environment are interrelated such as the environment influencing human behavior and human behavior affecting the environment.

*Corresponding author: rifoibnufalah@gmail.com

Copyright © 2022. The Authors. Published by LPPM ITATS

According to Carol Simon Weinstein and Thomas G David, the principles of the behavioral architecture theme that must be considered in the application of the behavioral architectural theme, according to Carol Simon Weinstein and Thomas G David, include being able to communicate with humans and the environment, accommodate the activities of its residents comfortably and pleasantly, fulfil aesthetic values, composition and form aesthetics, and pay attention to conditions and user behavior.

2.2 Behavior Setting

According to (Laurens, 2007) defines Behavioral Setting as a stable combination of activities, places, and criteria with elaboration, among others, there is an activity that is repeated and has a pattern (standing pattern of behavior), is in a certain environmental order (circumjacent milieu) refers on the physical and temporal boundaries of a setting related to space-time, forming a similar relationship between milieu and behavior (synapomorphy), and carried out at a certain period. Behavior setting can be interpreted simply as an interaction between an activity and a specific place (Setiawan, Haryadi B, 2014: 27) and can be interpreted as a social system on a small scale consisting of humans and physical objects strung together to form certain activities in time. and certain places (Kopec, Dak, 2010: 22) The term behavior setting is described in two terms (Setiawan, Haryadi B, 2014: 28) whose linkages form a certain behavior setting, namely the system of settings and the system of activity.

2.3 Defensible Space

In several developed countries, to protect environmental areas, security forces and city planners work together to implement a concept called defensible space, namely a mechanism for preventing criminal acts through informal social control or defined as space capable of playing a role in efforts to protect the environment. The concept of defensible space was introduced by Oscar Newman, an architect and urban planner from America through the book Defensible Space which was published in 1972. This concept explains the principles of space design and engineering to reduce crime.

In Defensible there are 4 (four) main principles:

a. Territoriality (control over space), refers to the attitude of defending the territory, providing clear boundaries for residential space that can be identified.
b. Natural surveillance (natural surveillance of the environment), namely the ability of residents to be able to monitor and see the general environment that exists in the region. Openness is the key to making it easier to see around the area at any time.
c. Image (impression) and Milieu (environment), namely negating the impression of an unsafe area or the ability applied to the physical design to give the impression of a sense of security.
d. Safe area is a designation to the surrounding community through the user's behavior patterns that the settlement is in a safe, comfortable, and calm condition.

3. Methods

The type of research conducted is qualitative research, to identify information and analyze occupants related to the behavior and needs of spaces regarding livable shelters. The research method used is a field study, to get facts to obtain facts directly from objects that are in places that are used as objects of study and find out the problems that have occurred in the field to get more accurate results. Literature study, to get a problem to be researched, look for information relevant to the problem under study, examine several basic theories that are relevant to the problem under study, look for approaches to find solutions to problems, and data as a deepening of knowledge related to problems in the object and discussion under study.

The data collection technique used interviews, to obtain and find out the data in the form of space programs and the required facilities. Observation, to obtain data in the form of appropriate behavior analysis in the field. Documentary, to get real image data in the field. And literature, to obtain data that supports the design object related to the title and theme of the object which will be used as a comparative study of the literature.

Types and sources of data used are primary data, to get data provided directly from the source, get the first information from interviews, and data that is still up-to-date, valid and accurate. Secondary Data, to obtain other supporting data as additional information from several other sources. The data analysis technique applies the process of all primary and secondary data that has been obtained to produce conclusions as a design reference for simple rental apartment problems.

The design method applies Donna P. Duerk to architectural theme theories in her book entitled Architectural Programming. The application of the method includes obtaining regional information from facts, analyzing problems obtained from issues, targets for realizing ideas through goals, and its application through performance requirements. Methods are applied to generate benefits from setting land arrangements that are adapted to their functions and create a useful quality of life.

Copyright © 2022. The Authors. Published by LPPM ITATS

4. Result and Discussion

4.1 Site Location Description

The location of site is in the City of Madiun which is a part of the city of East Java Province. The site is in a burial area called Bong Cino's grave and there are several public facilities around the area. The development area is in 1 area, namely on Jalan Hayam Wuruk. The location of the site which will be designed for a Simple Rent Flats building is close to education, commercial areas, and settlements of residents. The area to be designed has an area of approximately 1.9 hectares with a flat site.



Fig. 1 Site Plan Drawing

The people in this tomb area have low incomes and live simple life. People in this area generally work in the private sector, such as street vendors, residential traders, and itinerant traders. Social relations in the area include chatting with neighbors on the streets or alleys, chatting with neighbors in the open kitchen, and exchanging ideas on the terrace of the house which is used as a small shop. There is a patrol post as a guard for the environment. In the residential area of the community in this cemetery, the physical environment of the community is increasingly congested, and dense and imitates things from the outside that is not by the general environment of the area.



Fig. 2 Bong Cino Tomb Residential Pictures

4.2 Land Arrangement Plan

In the Bong Cino Cemetery area, there is a residential area that has been built in the area which has been passed down for generations for tens of years with a mass of buildings that are massive because the ownership of the house is considered private property but not over the land rights built by the building mass and activities which has exceeded the norm. Therefore, it is necessary to design simple rental flats while preventing activities that have become an urgency in the area.

To design simple flats for rent, it is necessary to arrange land that applies defensible space to produce a design that considers the behavior, psychology, and activities of the occupants in the site area which can operate naturally to reduce opportunities for crime and prevent crime in the site area. The application of defensible space for the area includes applying for one vehicle access, providing an active area and balancing the facilities outside the area in terms of area and each building mass. In planning for the area, supporting facilities for activities in the area are provided including residential

Copyright © 2022. The Authors. Published by LPPM ITATS

facilities, supporting facilities, open space facilities, public facilities, service facilities, and commercial facilities.

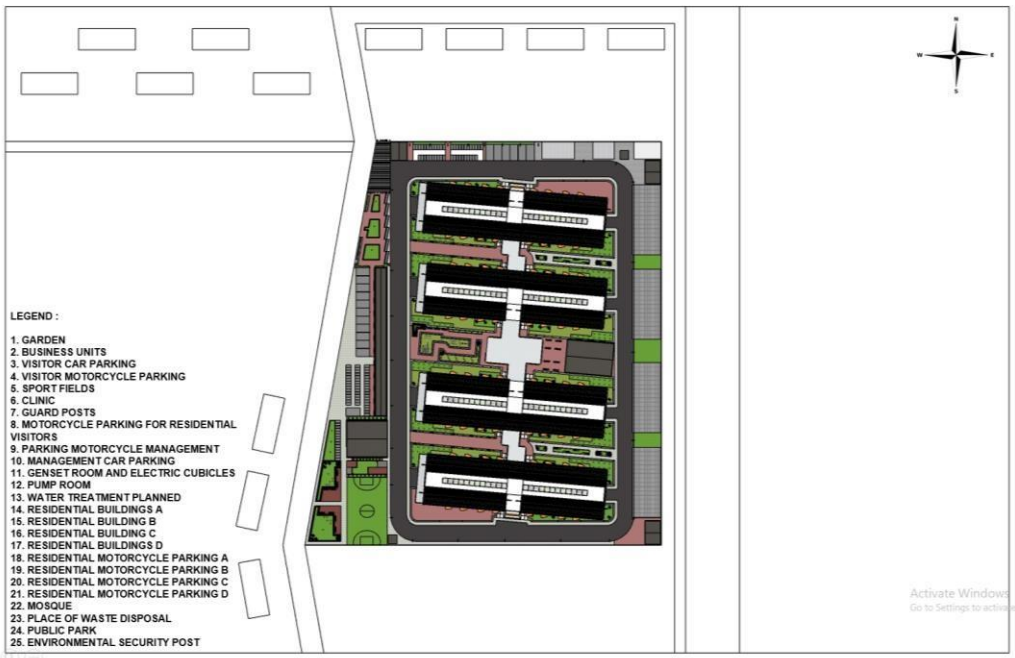


Fig. 3 Site Plan Pictures

Based on interview data and survey data, the arrangement of the open area has fulfilled the general arrangement, but the development has exceeded the limit, namely adjoining the Bong Cino Cemetery in several areas where the area looks dirty and activities that exceed the limit, it is necessary to adjust the rearrangement with the goals and functions of each area.

In supporting activities to improve the quality of life such as environmental, social, cultural, and economic activities, facilities are provided, including environmental activities with social activities, green open space parks, sculpture park areas, guard posts, active supporting parks, fields and parks are provided. play. For cultural and economic activities, multipurpose rooms or areas, kiosks and shops are provided. As for supporters, there are clinics and indoor facilities that support positive activities.

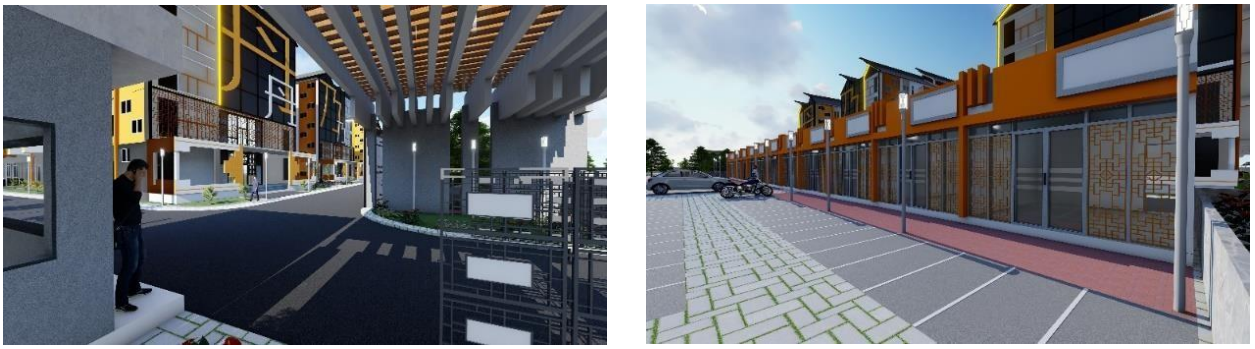


Fig. 4 Image of the Implementation of Defensible Space

Through interviews and surveys, data was obtained that vehicle access only has one access but there is no area guarding the area such as the security unit post room. Therefore, to support defensible space, namely continuing to implement one access for entering and leaving vehicles and adding a guard post for security units in the front area of the area. Aims to facilitate natural surveillance or community control from the outside into the area. In addition, from outside the area, there is no available access to and out of vehicles other than the main access and exit doors. In environmental monitoring for the circulation of entry vehicles, there are not only security unit posts but also environmental security posts with placements on regional road arteries which aim to monitor vehicle traffic and naturally monitor community activities in the environment in the area.

Through interviews and literature, most people in the area have jobs in the private sector, such as street vendors, residential traders, and itinerant traders. So, we need facilities that can accommodate and assist daily activities in social interaction activities, economic transaction processes, cultural activities, and other positive activities in the community.

Copyright © 2022. The Authors. Published by LPPM ITATS



Fig. 5 Image of the Implementation of Defensible Space

To support work or daily activities in implementing defensible space. Travelling around the area on the planning land, commercial facilities are provided, namely kiosks and shops located in the front area and outside the residential area of simple rental flats. In the existing area, from the circulation of vehicles and the arrangement between building masses, it seems that they are side by side with each other so that there is no safe active space so that the available area is only a dead area, and there is no supervision for socialization activities and citizen interaction.

Therefore, land realignment needs to be done by applying defensible space by providing active areas in the area so that natural surveillance can occur. The arrangement is that all arrangements have been maximized such as providing active areas in each area, and utilizing empty areas as parks or other regional functions so that the need for space can be maintained so that a sense of being watched can be felt.

Between the two buildings, there is an empty land used for access or pedestrian paths and an active garden filled with ornamental plants overgrown with green grass with additional seats for green open spaces that have been designed based on predetermined objectives to reduce crime in the area. area. Moreover, the addition of parks at each main point is to increase active space so that there are no dead spaces that will cause problems again.

The layout of the land is adjusted to the function of the building area that applies directional circulation so that user activities and circulation run safely with interconnected circulation, maximizing land that is adapted to its designation to reduce unwanted actions, and levelling various mass arrangements, landscapes, as well as supports in balance.



Fig. 6 Image of the Implementation of Defensible Space

In the existing area through field studies, there is no green area because the mass of buildings built in tomb areas are close together, there is no empty area that can be used as a green open park, and it is directly adjacent to the Madiun river. However, because the actions in the area of development that should not have been carried out in the area were not permitted, as a result of these actions, the environmental area of the area became slums, the arrangement of the area became irregular, and activities that exceeded the normal limit were carried out.

So, from these problems, the application of defensible space in the area, namely in the area of simply rented flats, every corner of the building is given vegetation in the form of shade plants, ornamental plants, to ground cover plants so as not to give a dry impression. The provision of vegetation makes the area fresher and livelier, and it is expected to have a positive effect. In addition to the matters previously explained, the surveillance area in the area is applied to vehicle parking areas, including car parking areas, motorbike parking areas, and public parking areas because social control starts from the parking area when entering the area. In the parking area, area restrictions are prioritized by the existence of a dividing line between vehicles so that natural arrangements can be applied and it is hoped that activities will be more regular after these restrictions. In addition, in the main building area of a simple rented flat, the occupant parking area is distinguished from the main building. This aims to facilitate natural surveillance in the area.

JCEPD-ISSN: 2830-3628
Copyright © 2022. The Authors. Published by LPPM ITATS



Fig. 7 Image of the Implementation of Defensible Space

Through field data or field studies on existing ones, there are no facilities that support positive activities and help manage important things available in the area. To support defensible space in the area, facilities are implemented which are expected to support area activities.

Supporting facilities that are implemented are the placement of a waste processing site which is placed at the corner of the regional road. Which is intended to facilitate the circulation of transport and opening. The flow of waste processing is using a differentiating system by providing five types of trash bins, processed using a press machine for waste. In implementing other supporting facilities, namely, there is a mosque which is placed in the central area of the area which aims to even out the spiritual side of the community and is expected to add religious aspects.

In the development area, there is vegetation as a territorial boundary to help make a defensible space feel. Restrictions are made to reduce problematic activities obtained previously. Zoning has been adapted to the function of the building in user activities and avoids closed areas that are rarely reached so that it is evenly distributed on all sides of the area.

5. Conclusion

The design of simply rented flats in the Bong Cino Cemetery area is a solution to problems in the development plan area, including the existence of long abandoned tombs, slums and illegal settlements, area land which is government assets, and the use of tombs that are misused. This design applies a defensible space, which considers efforts to protect the environment through social control, and pays attention to the behavior, psychology, and activities of residents in the area where the design is applied.

The things that need to be explained in the site plan in supporting defensible space are that entry and exit access only has one route with supervision through security unit posts and regional guard posts. Between the two buildings, there is vacant land that is used for access or pedestrian paths and active parks and vegetation as area boundaries. The layout of the area is adjusted to the function of the building and zoning that has been adapted to user activities and avoids closed areas that are rarely reached so that it is evenly distributed on all sides of the area.

There are deficiencies in the research, namely the lack of field data and literature data regarding activities, characteristics, and activities in full against the people in the Bong Cino Cemetery area. Suggestions for further research are to obtain detailed field study information and to obtain more complete literature data.

Acknowledgments

Thanks are conveyed to whole my family, Ma'am Firdha Ayu Atika and Sir Failasuf Herman Hendra as my advisor, so that this research can be completed properly.

Copyright © 2022. The Authors. Published by LPPM ITATS

References

[1] Modul Pengelolaan Rusunawa Kementerian Pekerjaan Umum dan Perumahan Rakyat Tentang Jenis Ruang dan Fasilitas Penunjang Pada Rumah Susun.

[2] Ramadhani, A. N., Faqih, M., & Hayati, A. (2017). *Behaviour setting and spatial usage analysis on sombo low cost flat's corridor. Journal of Architecture&ENVIRONMENT*, 16(1), 61-74

[3] Haqy, A. A. (2016). Penerapan Konsep Defensible Space Pada Hunian Vertikal (*Doctoral dissertation*, Institut Teknologi Sepuluh Nopember).

[4] Sriwijayati, R., & Navastara, A. M. (2021). Perwujudan Faktor Ruang yang Dapat Bertahan (Defensible Space) Terhadap Kriminalitas di Kecamatan Kamal. *Jurnal Teknik ITS*, *9*(2), C168-C175.

[5] Saputro, B. W., Musyawaroh, M., & Handayani, K. N. (2018). Penerapan Desain Arsitektur Perilaku pada Perancangan Redesain Pasar Panggungrejo Surakarta. Senthong, 1(2).

[6] Purwantiasning, A. W., & Prayogi, L. (2019). Penerapan Konsep Arsitektur Perilaku Pada Penataan Kawasan Zona 4 Pekojan Kota Tua Jakarta. PURWARUPA Jurnal Arsitektur, *2*(2), 83-92.

[7] Marpaung, B. O., & Zahrah, W. (2016). Penerapan Arsitektur Perilaku Pada Perancangan Rumah Susun Bagi Nelayan Studi Kasus: Lorong Proyek Kelurahan Bagan Deli, Kecamatan Medan Belawan, Sumatera Utara (*Doctoral dissertation*).

[8] Sembiring, D. A. (2017). Kajian Perancangan Permukiman Kampung Aur Di Kota Medan (Dengan Pendekatan Arsitektur Perilaku Dan Lingkungan). *Educational Building Jurnal Pendidikan Teknik Bangunan dan Sipil*, *3*(1 JUNI), 60-72.

[9] Crowe, T., & Fennelly, L. (2013). *Crime prevention through environmental design*. Elsevier.

[10] Muhyi, M. M., Gabe, R. T., & Adianto, J. (2019, May). Defensible space in urban housing in Indonesia. In *IOP Conference Series: Materials Science and Engineering* (Vol. 523, No. 1, p. 012050). IOP Publishing.

JCEPD-ISSN: 2830-3628
Copyright © 2022. The Authors. Published by LPPM ITATS