
A MINIMALIST HOUSING DESIGN WITH TROPICAL ARCHITECTURE APPROACH IN MEDAN CITY

Fahri Ramadhan Nasution¹, Novalinda², Bhakti Alamsyah³

Architectural Engineering, Universitas Pembangunan Panca Budi Medan

fahrinasution88930@gmail.com

Abstract

Land in Medan City is increasing limited. This is because the need for residential houses is increasing every year so that more housing is built. Building a housing requires a large area of land in a strategic location, but due to increasing limited land conditions, a solution is needed in designing a residential house on limited land. Along with the development of the times, there are residential design solutions to the various limitations that exist on the land, namely Tropical House. Tropical House is a simplified house, from design to function space. Tropical House housing will be designed in Medan with a tropical climate so that the housing is designed by combining the principles of a compact house and the principles of tropical buildings. Compact houses and tropical buildings share the same principles and there are also opposing principles. Tropical buildings have the principle of having a high roof, but the principle in a compact house is that no space is wasted and space requirements are met even on limited land. Therefore, the efficient concept is applied to a multifunctional spatial arrangement, one of which is by placing space between floors (mezzanine). The mezzanine functions as a vertical addition of space and the room on the 1st floor that does not have a mezzanine also has high ceilings so that it can handle heat and air circulation can also flow properly. the efficient concept is applied to a multifunctional spatial arrangement, one of which is by placing space between floors (mezzanine). The mezzanine functions as a vertical addition of space and the room on the 1st floor that does not have a mezzanine also has high ceilings so that it can handle heat and air circulation can also flow properly. the efficient concept is applied to a multifunctional spatial arrangement, one of which is by placing space between floors (mezzanine). The mezzanine functions as a vertical addition of space and the room on the 1st floor that does not have a mezzanine also has high ceilings so that it can handle heat and air circulation can also flow properly.

Keywords: House, Minimalist, Tropical, Population Density



1. INTRODUCTION.

Tropical architecture is an architectural design that takes into account the tropical climate. While the tropical climate itself is characterized by a number of climatic factors Karyono TH. (2000) The demand for land in the urban area of Medan is increasing. Indeed, the population is increasing every year, so the need for housing is also increasing. Land funds in the center of Medan are increasingly limited, so a solution is needed to meet the housing needs of the community. The population growth of the city of Medan has an impact on the demand for housing in the city of Medan which is also increasing. Therefore, the Medan city government controls it by building vertical buildings in the city of Medan.

Results Currently, there are investors who are looking for apartments or condominiums for the real estate business, and of course prices in Medan tend to be high. This is because the people of Medan City still tend to build settlements with a horizontal model, so that the private sector (especially real estate developers) tends to follow market demand. build a vertical model. This can be seen from the increasing number of houses being built in the city of Medan. The design of the house can accommodate all the activities of the owner on minimal land so as to produce a house with a number of houses that are more than the capacity of conventional house designs. Along with the times, there are housing design solutions for the various limitations that still exist in this field, namely minimalist housing. Minimalist housing is a residence that can withstand tropical climates and extreme weather. Each element of the building is designed to allow light to enter freely. House simplified, from design to functional space.

The city of Medan has a tropical climate which is divided into two parts, namely the rainy season and the dry season. Based on the climate data of the city of Medan, the house needed is a house whose house design can meet these climatic conditions.

According to Akmal (2008), the presence of furniture reduces the elements that fill interior spaces that are no longer needed. The house designed is located in Indonesia, precisely in the city of Medan. The climate of Medan City is a tropical climate which is divided into 2 parts, namely the rainy season and the dry season. The concept of a tropical house is basically an adaptation of a building to a tropical climate where tropical conditions require special treatment in its design. The influence mainly comes from conditions of high temperature and humidity, where the effect is very pronounced on the comfort level of the room. The level of comfort such as the degree of coolness of the indoor air by air flow is an example of the application of the concept of a tropical house (Windarti, 2012). Buildings in tropical climates should be ventilated with sufficient space between buildings to ensure air circulation.

The orientation of the building is placed between the sun's trajectory and the wind direction as a compromise between the position of the building which is east to west and the position perpendicular to the wind direction. The building should be rectangular, which supports the application of cross ventilation. The following is a picture that illustrates the location of the building that has the most sun protection when choosing the east to west direction and an illustration of the location of the building that has the most advantage of sun protection when choosing a direction perpendicular to the wind direction.

2. RESEARCH METHODS

This research was conducted at Jalan Gatot Subroto using a qualitative descriptive method. Every aspect under study is explained through description and establishing the facts or truths of a theory. According to Semiawan (2010) qualitative research method is a research method used to examine the condition of natural objects, data collection techniques are carried out by a combination of observation, interviews, and documentation.

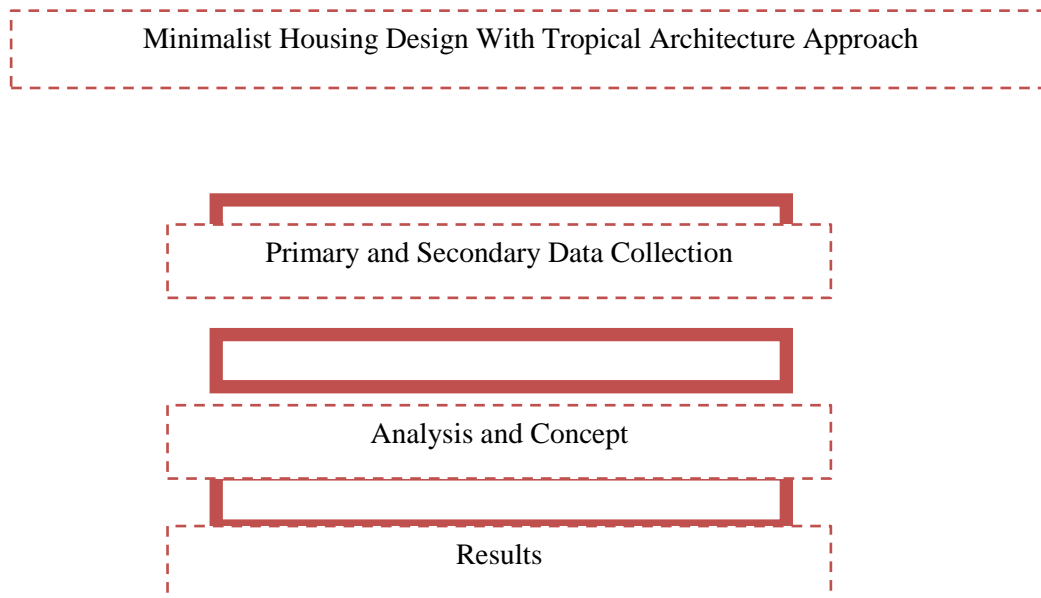


Figure 1. Research Method

Source: Author 2022



3. RESEARCH RESULT

3.1. Research result

The location of the minimalist tropical residential design of Medan City is on Gatot Subroto street, Sei Sekambing Village, Medan Helvetia District. The boundaries of the settlement are as follows: in the north it is bordered by Gatot Subroto street and the Sei Sekambing Post Office. To the west, it is bordered by a resident's house. To the south it is bordered by Murai street and residential areas. To the east it is bordered by Village Road. The area of the design point of the residential area is 3199 m².

The area around the points is a residential and commercial area. Based on the 2014 RTBL, the KDB of the area is 80 and the GSB of street Gatot Subroto is 10 m north of the center line and m from the south of the channel. Tropical homes are emerging and thriving in urban centers where land funds are limited and land prices are rising. Therefore, many people prefer to plant doi with small sizes. The city of Medan is one of the cities whose population is increasing every year, so that the living environment in the city of Medan is increasingly dense, especially in the city center. One of the city centers of Medan City is located in Medan Helvetia District, precisely on Gatot Subroto street, the majority of which are commercial areas. This area is the location of tropical house designs based on examples of good tropical houses in Indonesia.

- Located in a bustling area with trade and services as well as easy transportation facilities thereby increasing the potential for convenience to be reached.
- The main road in front of it is quite wide, which is 16 m and consists of two lanes so as to reduce congestion.
- The topography tends to be flat so it does not require complicated handling.
- Strategic conditions so that the location matches the minimalist housing concept of user needs.



Lokasi : Jl. Gatot Subroto
Luas : $\pm 30.200 \text{ m}^2$
Batas :
Utara : Jalan Gatot Subroto, Mitra 10
Selatan : Perumahan Warga
Timur : BPKP Sumut
Barat : Perumahan Warga

Figure 2. The location of the design of the Medan City Minimalist Tropical Architecture Housing

In Regional Regulation No. 13 of 2011 concerning the RTRW of Medan City, medium density housing as referred to in paragraph (2) letter b is stipulated in:

- a. Belawan Happy Village, Medan Belawan District;
- b. Durian Village, East Medan District;
- c. West Sei Putih Village, Central White Sei Village, and Sekip Village, Medan Petisah District; and
- d. Central Helvetia Village, Medan Helvetia District.



Table 1. About the Detailed Spatial Planning and Zoning Regulations for Medan City 2015-2035

No	Zone Classification	Minimum Width	Minimum Length	Ground Floor Area Minimal Building	Side Border Minimal Building	Back Border Minimal Building
1	2	3	4	5	6	7
1	High Density Housing	5 m	6 m	36 m ²	1.5 m	1.5m
2	Medium Density Housing	6 m	7 m	45 m ²	1.5 m	1.5m
3	Low Density Housing	8 m	8 m	64 m ²	1.5 m	1.5m

- High Density Housing Allowed to overlap on both sides or row building with a maximum length of 60 m.
- Medium Density Housing Allowed to coincide with two remnants or row building with a maximum length of 60 m.
- Low Density Housing Allowed to squeeze on one side or coupling building

In Article Number 12 of 2021 concerning Amendments to Government Regulation Number 14 of 2076 concerning the Implementation of Housing and Settlement Areas

The composition as referred to in paragraph (1) on:

a. construction of large-scale housing, namely 1 (one) luxury house compared to at least 2 (two) medium-sized houses and at least 3 (three) simple houses;

b. housing development other than large scale consists of: 1. 1 (one) luxury house compared to at least 2 (two) medium-sized houses and compared to at least 3 (three) simple houses; 2. 1

(one) luxury house compared to at least 3 (three) simple houses; or 3. 2 (two) medium houses compared to at least 3 (three) simple houses.

3.2. House Concept Type 80, 150, & 200

Tropical design does influence people's behavior, where various physical artifacts of architectural works are released from the context of geographical space and time and are then reproduced as commodities which are currently widely used as daily themes in urban housing complexes.

The Type 80 concept that relies on house lighting so as to maximize the condition of the land and garden areas that support the home situation and air circulation in the housing section

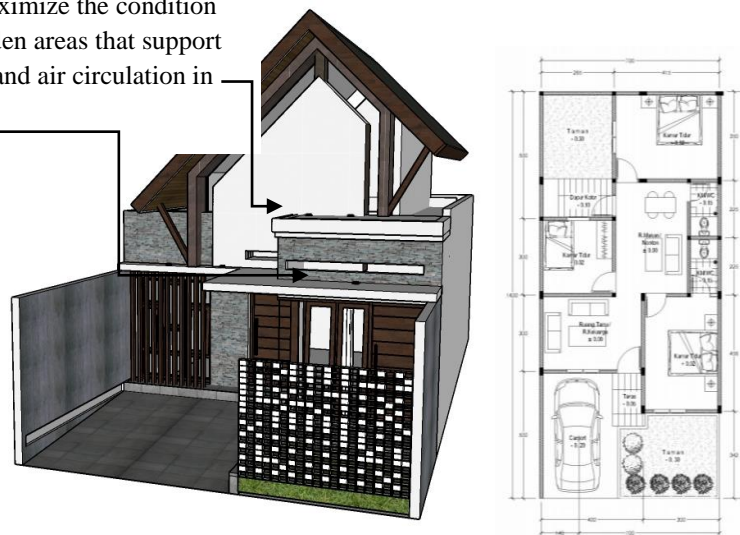


Figure 3. Design Type 80

Source: Author 2022

Bitumen roof

Natural stone as an aesthetic enhancer

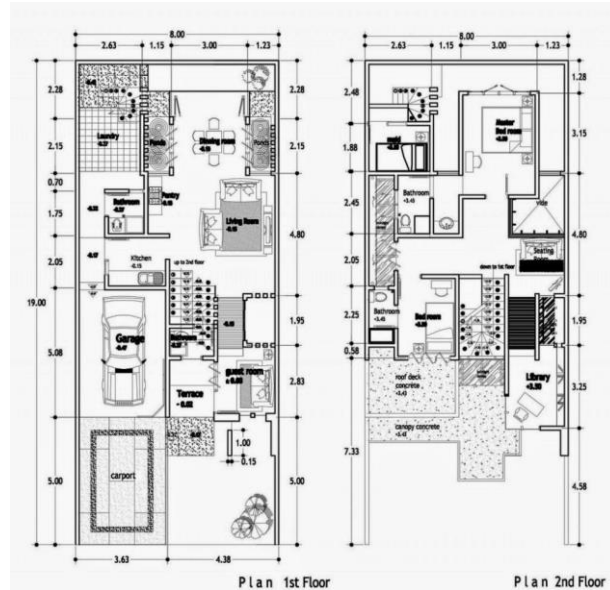
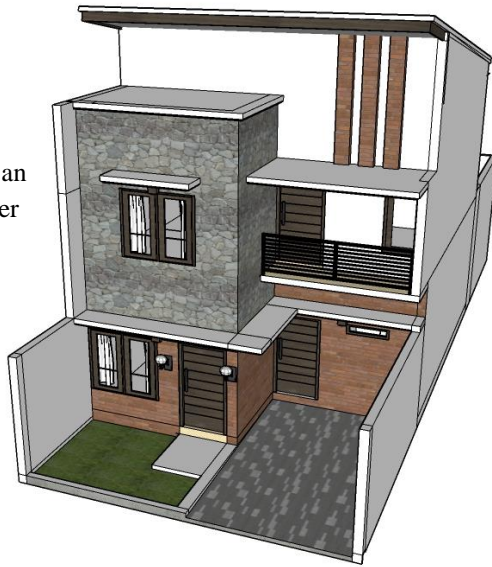


Figure 4.Design Type 150

Source: Author 2022

The use of a tropical concept in a type 150 house that maximizes space patterns and air circulation and lighting so as to maximize the functionality of the house by using natural stone materials, openings in windows and ventilation and in terms of an environmentally friendly roof, namely bitumen roof and the use of camwood material as a heat absorber. The main advantage of bitumen is its extremely strong durability. This is because this roof has excellent strength, especially in resisting fire, water, and even strong hurricanes.

The disadvantages of bitumen roofing are that they are quite expensive, the installation process requires adjustments, requires a lot of installation equipment, and roof maintenance costs are quite high.



3.3. Lighting and Circulation Concept

Good lighting can be applied by providing ventilation in the form of windows that are large enough and adding skylights to the roof of the building and placing it in the middle of the residential building so that the light entering the residence is more optimal so as to reduce the use of lights during the day so that it is more energy efficient. . The type of lamp used is an energy-efficient LED lamp that is used only at night. Good circulation can also be applied by placing openings in the form of windows and doors with a cross ventilation system so that air from outside can enter and be channeled into the space in the residence.

4. CONCLUSION

Minimalist accommodation with tropical approach in the tropical climate of Medan City applies the concept of efficiency. Draft efficiency born from principle Tropical house and principle tropical building. Draft efficiency applied to area design idea sand design ideas building. The concept of efficiency is applied in every house to manage the arrangement of outdoor and indoor spaces as a combination. lots of space, open space, multi-Functional home furnishings and limited space are fooled by the built-in furniture. The arrangement of outdoor and indoor spaces appropriate can optimize land use so that no land fallow. On a plot of land not all housing lots are used for buildings, but there are some land that serves as garden with indoor air conditioning function house and as barrier between houses. Efficiency the use of energy in every home, namely by utilizing sunlight to lighting experience which maximum. The house is also designed use natural ventilation to reduce the use of artificial ventilation (water conditioning).The house has many opening including using the system ventilation overall, has a flower-shaped trellis which canob struct sunshine how ever permanent allow circulation room and use vertical garden so that the incoming air is more comfortable.



REFERENCES

- Frick, Heinz and Tri Hesti Mulyani, 2012. Ecological architecture. Canisius. Yogyakarta
- State Secretariat of the Republic of Indonesia. 2011. Law of the Republic of Indonesia Number 1 concerning Housing and Settlement Areas of 2011. State Secretariat of the Republic of Indonesia. Jakarta
- Frick, Heinz.1984. National Standardization Body. 2004. SNI 03-1733-2004. Procedures for planning the housing environment in urban areas. Simple house. Yogyakarta: Canisius Publishers
- Hardiman G. 2012. Consideration of humid tropical climate in the concept of modern building architecture. JOURNAL OF ARCHITECTURE Vol. 2, No. 2.
- Karyono TH. (2000) Redefining tropical architecture in Indonesia. 7-8 p.m.
- Karyono TH (2016) Tropical Architecture and Energy Efficient Buildings. Journal of Kalang, Department of Architectural Engineering, Tarumanagara University Vol. 1, No. 1.
- Prasidya AA, and Citraningrum S (2019) Evaluation of the Tropical Climate Response Concept at Cafe Mezzanine in Yogyakarta City. Student Journal of Architecture Department Vol. 7, No. 2.
- Literature, Suparno. 2006. Housing Planning and Development, Andi Publisher, Yogyakarta.
- Simbolon, H., & Nasution, IN (2017). Environmentally Friendly Residential Design For Tropical Climates. Educational Buildings, 3(1), 46–59. <https://doi.org/10.24114/eb.v3i1.7443> Settlement Areas 2011. State Secretariat of the Republic of Indonesia. Jakarta
- Windarti, Fina. 2012. Environmentally Friendly Architectural Buildings According to Tropical Architecture Concepts. Department of Architectural Engineering. Faculty of Planning and Civil Engineering. East Java "Veteran" National Development University. Surabaya