

## IMPLEMENTATION OF GREEN BUILDING CONCEPT IN SUMMARECON MUTIARA HOUSING IN MAKASSAR CITY

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### **Abstract**

*The green building concept is a strategy to reduce global warming caused by the construction sector. The application of the green building concept is increasingly becoming an important topic in modern housing development to reduce negative impacts on the environment in improving the quality of life of its occupants. Green buildings not only focus on energy efficiency and waste reduction but also pay attention to the health of occupants and harmonious integration with the surrounding environment. The application of the green building concept in Summarecon housing has met the Green Building Council Indonesia (GBCI) standards, but due to the need for occupant space, the homeowner changed the green open area, which resulted in the house no longer meeting GBCI standards. This change was caused by the need for a lot of homeowner space, resulting in excessive electricity use and suboptimal air ventilation. This research method was carried out using a qualitative method, this study aims to determine the application of the post-occupancy green building concept in Summarecon Mutiara housing, Makassar City.*

**Keywords:** Green Building, Housing, Settlements

### **INTRODUCTION**

Buildings are one of the basic human needs and are commonly referred to as "shelters" in the terminology of basic needs such as clothing, housing, and food. However, it turns out that buildings also contribute to environmental damage caused by the loss of green space and agricultural land, the use of environmentally unfriendly construction methods and materials, and waste of thermal energy. These negative impacts can be minimized by implementing environmentally friendly buildings. Environmentally friendly buildings focus on environmental sustainability, paying attention to the negative and positive impacts on the climate throughout its life cycle, from design, construction, operation, maintenance, and renovation to the natural environment. The application of the green building concept is increasingly becoming an important concern in modern housing development. This concept aims to reduce negative impacts on the environment while improving the quality of life of its occupants. Green buildings not only focus on energy efficiency and waste reduction but also pay attention to the health of occupants and harmonious integration with the surrounding environment.

Based on "Regulation of the Minister of State for the Environment No. 8 of 2010, concerning the Criteria for Certification of Environmentally Friendly Buildings Chapter I Article 1," environmentally friendly buildings, or so-called green buildings, are buildings that apply environmentally friendly principles in their planning, construction, operation, and management, and one of the important things is being able to handle the effects of climate change. In the "Regulation of the Minister of State for the Environment No. 8 of 2010, concerning the Criteria for Certification of Environmentally Friendly Buildings Chapter I Article 1," an environmentally friendly building, or so-called green building, is a building that applies environmentally friendly principles in its planning, construction, operation, and management, and one of the important things is being able to handle the effects of climate change. The environmentally friendly principle in question is the principle that prioritizes and pays attention to elements related to the function of preserving the surrounding environment. Environmentally friendly buildings focus on environmental sustainability, paying attention to negative and positive impacts on the climate throughout its life cycle, from design, construction, operation, maintenance, and renovation to the natural environment.

The application of the green building concept is a response to two main challenges, namely rapid urban growth and global climate change. Makassar City, as the center of economic growth in Eastern Indonesia, has experienced a rapid increase in housing and infrastructure development. However, this growth also carries risks to the environment, such as increased carbon emissions and decreased air quality. The green building concept in Summarecon Mutiara Makassar housing is designed to reduce the carbon footprint, utilize natural resources efficiently, and optimize the health of residents with cleaner air and more open green spaces. This is in line with the global commitment to reduce the impact of climate change and create a quality environment for future generations. This concept not only provides short-term benefits in energy savings and operational costs but also provides long-term investment in environmental sustainability and community welfare. Thus, the implementation of green buildings is not only a solution for the present but also an investment for a more sustainable and resilient future. The purpose of this study is to determine the application of the post-occupancy green building concept in the Summarecon Mutiara housing complex in Makassar City.

## **RESEARCH METHOD**

This research method is carried out using a qualitative method. According to Sugiyono (2021:1), a qualitative research method is a study used to examine natural objects where the researcher is the key instrument. The purpose of this descriptive research is to create a systematic, factual, and accurate description, picture, or painting of the facts, characteristics, and relationships between the phenomena being investigated.

In this study, the building that is the case study is the Summarecon Mutiara Housing. Summarecon Mutiara is an independent city in Makassar, located on Mutiara Boulevard Street, Bulurokeng Village, Biringkanaya District. This location is very strategic because it is close to the airport and port. This independent city was built

into a city with an international residential and business center flanked by two public transportation accesses. The commercial area in Summarecon Mutiara will become a new business trade center. With the facilities, the independent city will become a community center and shopping destination with a modern shopping center available in it. The combination of residential and business areas offers a more efficient style.

## RESULT AND DISCUSSION

### Findings (may be subtitles) (1500-2500 words)

In this study, the building that is the case study is Summarecon Mutiara Housing. Summarecon Mutiara is an independent city in Makassar, located on Mutiara Boulevard Street, Bulurokeng Village, Biringkanaya District. This location is very strategic because it is close to the airport and port. This independent city is built into a city with an international residential and business center flanked by two public transportation accesses. The commercial area in Summarecon Mutiara will become a new business trade center. With the facilities, the independent city will become a community center and shopping destination with modern shopping centers available in it. The combination of residential and business areas offers a more efficient style.



**Figure 1.** Research Location

(Source : <https://maps.app.goo.gl/1arhSaHNqCGs1Lbr8>)



**Figure 2.** Site Plan of Summarecon Mutiara Housing

(Source : <https://www.summareconmutiara.com/projects/jade-residence>)

Summarecon Mutiara Housing is divided into several types (Jade), including Jade 8 with 22 houses, Jade 9 with 24 houses, Jade 10 with 49 houses, Royal Jade with 8, and Club House with 1. This study focuses on the Jade 10 (Standard) house type, with a land area of 180 m<sup>2</sup> and a building area of 209 m<sup>2</sup>. Facilities on the 1st floor include 2 bedrooms, 1 living room, 2 bathrooms, 1 kitchen, 1 living room, 2 gardens, 1 garage, and 1 carport. Facilities on the 2nd floor include 3 bedrooms, 2 bathrooms, 1 laundry room, 1 lounge, and 1 balcony. This study uses a sample house plan and house 1 with the same type as a comparison to understand the condition of existing green buildings, including the use of green open spaces with a description of the type of space, use of energy sources, use of rainwater, waste management, and plants in Summarecon Mutiara Makassar Housing.



**Figure 3.** Sample House Plan

(Source: <https://www.summareconmutiara.com/projects/jade-residence>)



**Figure 4.** House Plan 1

(Source: Author Analysis, 2024)

a. Suitability of Land Use

Based on the results of the questionnaire, respondents can understand green open space because seen from the picture of the 1st floor house plan, the example house plan with house 1, respondents still maintain and add some vegetation to the front garden area of the house.



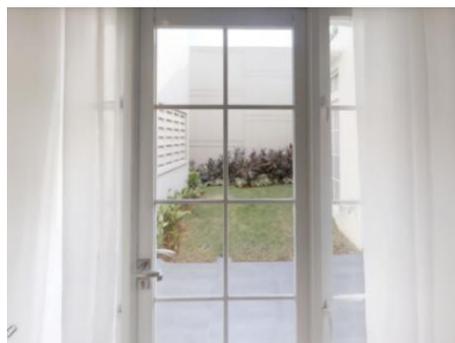
**Figure 5.** Initial House Plan and House Plan 1  
(Source: Author's Analysis, 2024)



(a) Front Garden of Example House (b) Front Garden of House 1

**Figure 6.** Condition of Front Garden of Example House and House 1  
(Source: Author's Documentation, 2024)

However, the garden area behind the house was changed by the respondent on the grounds that the garden had red soil, where, when it rains, water hits the garden soil and splashes onto the walls and glass doors.



**Figure 7.** Condition of the Backyard Garden of the Example House  
(Source: <https://www.summareconmutiara.com/projects/jade-residence>)

In addition, respondents also need additional space, so the garden is used as a family room and dining room. In the floor plan of the house, the example house plan

and House 1 below are comparisons of the existing conditions of houses with the same type.



**Figure 9.** Condition of the Rear Area of the Example House  
(Source: <https://www.summareconmutiara.com/projects/jade-residence>)



**Figure 10.** Condition of the Rear Area of House 1  
(Source: Author's Analysis, 2024)

Respondents have added additional rooms by removing the green open space behind the house and then making it a dining room and family room. The second floor is used as a bedroom totaling 4 rooms as seen in picture 11



House Plan Example of a 1 Floor and House Plan 2 Floors 2

**Figure 11.** Condition of the Rear Area of the 2nd Floor  
(Source: Author's Analysis, 2024)

As seen in Figure 12, where the respondent's house was expanded by adding one floor above it which was used as a laundry room, so that the total became 3 floors at the back of the house. However, the housing developer said that the addition of rooms was allowed as long as it did not exceed the roof of the building in the initial design.



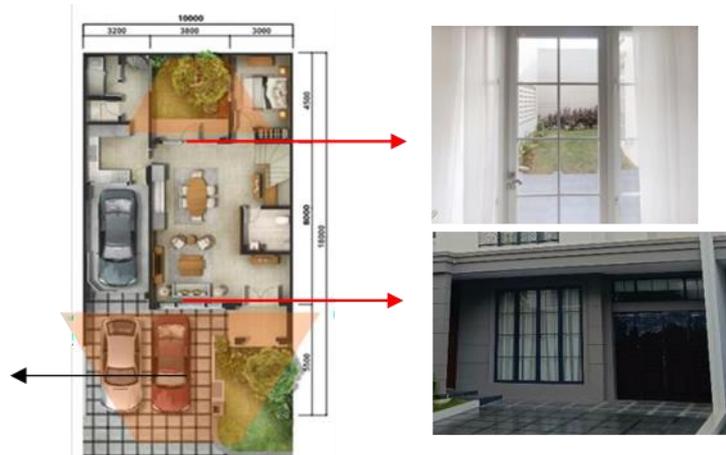
House Plan Example of a 1 Floor House Plan 2 Floors 2

**Figure 11.** Condition of the Rear Area of the 2nd Floor  
(Source: Author's Analysis, 2024)

b. Energy Efficiency and Conservation

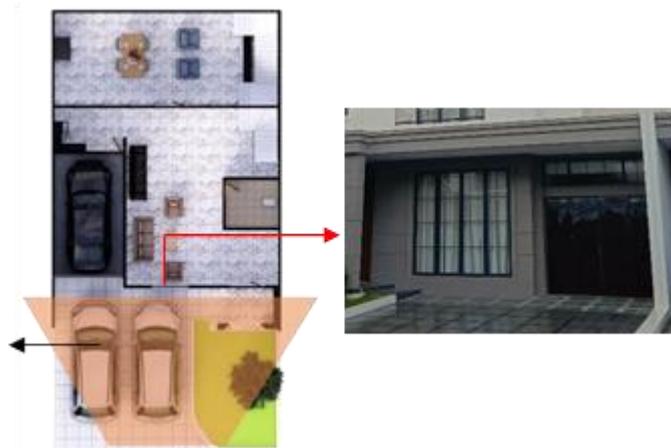
Based on Figure 13, there is natural lighting coming from two directions, namely from the front window of the house and the back area (garden), so that the natural lighting that enters the house in the morning and evening is very good. The presence of windows and ventilation in front of the house and the back area of the house (garden) is a good step for sunlight to enter. This can help reduce energy

consumption for artificial lighting. So that in House 1 the lighting that enters the house during the day and evening is not very optimal.



**Figure 13.** Natural Lighting Entering the Example House  
(Source: Author's Analysis, 2024)

Based on the questionnaire answers, regarding the use of natural lighting during the day until the evening, it is maximized well because there are windows and ventilation in front of the house, as seen in Figure 14. So that in House 1, the lighting that enters the house during the day and evening is not very optimal.



**Figure 14.** Natural Lighting Entering House 1  
(Source: Author's Analysis, 2024)

The use of electrical energy in his house is considered very good in daily use. However, in reality the green open space in sample house 2 has been removed. As a result, lighting and ventilation in the house use a lot of electrical energy, because the house requires lighting from lamps and ventilation from air conditioning.

c. Water Conservation

Based on the respondents' questionnaire answers, regarding the utilization of rainwater in Summarecon Housing, it involves the flow of rainwater that flows through a reservoir to then be collected in an underground well. The water stored in the well can be used for several purposes, such as watering plants or washing outdoor equipment and vehicles. In this way, rainwater that was previously wasted can be reused for useful purposes in the housing environment.



**Figure 16.** Rainwater Utilization in House 1  
(Source: Author's Analysis, 2024)

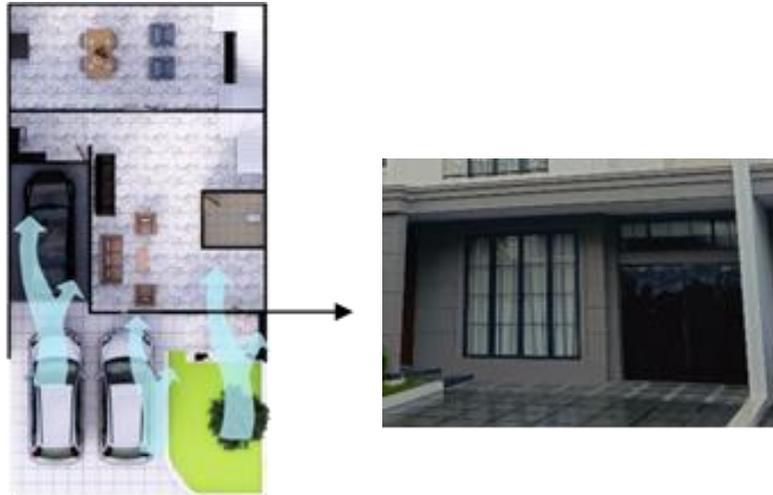
d. Air Quality and Spatial Comfort

The presence of windows and ventilation in front of the house, as seen in Figure 17, is a good step in allowing natural air circulation into the room. This can help reduce energy consumption for artificial cooling. Natural ventilation or cross ventilation occurs in the back garden area and the front area of the house, so that the ventilation that enters the house in all rooms is very good.



**Figure 17.** Natural Ventilation Entering the Example House  
(Source: Author's Analysis, 2024)

Based on the respondents' questionnaire answers, the ventilation in their homes is very good, because the ventilation from the front of the house occurs through 4 vents and 4 windows, as seen in Figure 18 which shows good air quality. So in House 1 the quality of air entering the house is lacking.



**Figure 18.** Natural Ventilation Entering House 1  
(Source: Author's Analysis, 2024)

e. Building Environmental Management

Based on the respondents' questionnaire answers, the waste management process in Summarecon Mutiara housing includes providing facilities for building users to sort waste according to type, quantity, and nature. This facility allows the collection and transfer of waste from its source to a temporary shelter or integrated waste processing facility. The main requirement for this criterion is the availability of waste bin facilities as seen in Figure 16, which shows an example of a waste disposal facility that has been separated between organic and inorganic. The waste is then collected by the Waste Disposal Site officers and taken directly to the final processing site that carries out the separation for recycling.



**Figure 20.** Household Trash Can 1  
(Source: Personal Documentation, 2024)

## **Analysis/Discussion**

Government regulations have regulated the six aspects of green buildings in Indonesia. First, the study of the appropriate land use aspect according to Law Number 28 of 2002 concerning Building Construction Number and Law 26 of 2007 concerning spatial planning and buildings, that a building must be constructed in accordance with the designation of the building. Appropriate land use is applied to create sustainable development, as regulated in Law Number 32 of 2009 concerning Environmental Management and Protection. The Spatial Planning Law states the need for spatial planning that is harmonious with the environment, both natural and artificial. It is also necessary to create green open space (RTH) in the city with a minimum area proportion of 30%. Alternative transportation is also regulated in the regulation.

Second, regulations on energy efficiency and refrigerants have been regulated through Law Number 30 of 2007 concerning Energy and ESDM Ministerial Regulation Number 14 of 2012 concerning Energy Management, PP Number 79 of 2014 concerning National Energy Policy, Presidential Instruction Number 13 of 2011 concerning Energy and Water Savings, and others. Energy usage of more than 6000 tons of oil per year is required to implement energy management.

Third, water conservation is regulated in Law No. 7 of 2014 concerning Water Resources, Government Regulation No. 42 of 2008 concerning Water Resources Management, Presidential Instruction No. 2 of 2008 concerning Energy and Water Savings, and others. This regulation has regulated the details of water savings, such as sanitary equipment, water requirement calculations, and water meters. The installation of rainwater storage tanks is also set to have a capacity of 50% of the amount of rainwater that falls according to the annual rainfall according to BMK. The water sources used are not allowed to come from groundwater or PDAM sources.

Fourth, air quality and comfort are regulated in Law No. 36 of 2009 concerning Health, Government Regulation No. 41 of 1999 concerning Air Pollution Control, and so on. The government regulates that every building has health requirements for its occupants in order to realize a healthy environmental quality, both social, biological, chemical, and physical. In the Decree of the Minister of Health 1405 of 2002, the general room temperature is regulated at 25 degrees Celsius with a relative humidity of 60%.

Fifth, building environmental management related to waste management. Regulations related to this are Law No. 18 of 2008 concerning Waste Management, PP No. 81 of 2012 concerning Management of Household Waste and Waste Similar to Household Waste, and PP No. 101 of 2014 concerning Management of Hazardous and Toxic Waste. Based on the results of the study, green buildings in accordance with the GBCI rules in house 1 have not been fully met.

According to the regulations on Appropriate Land Use in Law Number 28 of 2002 concerning Buildings and Law Number 26 of 2007 concerning Spatial Planning and Buildings, a building must be built according to its designation. However, in practice, this regulation is not applied in the respondent's post-occupancy home due to several factors, such as the need for space that is still needed by the homeowner. This causes changes in the green open space area, which reduces the comfort of the space in the house, so that more ventilation and artificial lighting are used.

## **CONCLUSION**

The government has issued various rules in the form of laws and regulations to support the development of green buildings in Indonesia. Summarecon Mutiara Housing in Makassar City has implemented a green building concept that is in accordance with government regulations and the Green Building Council of Indonesia, or GBCI, the implementation of which is carried out from various aspects ranging from energy conservation to environmental management. The implementation of green buildings can be developed by utilizing local knowledge, renewable materials, water conservation, air quality, and adequate environmental management.

Therefore, house 1 does not meet the GBCI standard because its high energy consumption is caused by several factors, including poor insulation systems, the use of non-energy-efficient equipment, and a design that fails to utilize natural lighting. The lack of efficiency in these various aspects leads to higher operating costs, especially in terms of energy use. In addition, House 1 may not pay attention to aspects of occupant comfort, such as natural lighting, air circulation, and temperature control, which can have a negative impact on their well-being. The inability to meet the GBCI standard indicates that House 1 has significant deficiencies in terms of energy efficiency and occupant comfort.

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