

Designing Islamic Boarding School with Green Architecture Approach in Medan City**Vinky Rahman*¹, Audry Claudya Sari²**¹Architecture Department, Faculty of Engineering, Universitas Sumatera Utara, Medan, 20155, Indonesia

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Abstract (English)

Islamic boarding schools are the oldest religious educational institutions in Indonesia. Initially, they focused on spiritual science. But as time went by, general education also developed in it. Islamic boarding school education helps students balance religious knowledge and general knowledge, as well as form good character. Locations that interfere with the learning process. In addition, many students from outside the city feel lonely and stressed. Therefore, a comfortable environment is needed. Implementing Green architecture can create a positive physical and social environment in Islamic boarding schools. Green plants provide tranquility and green architecture encourages environmental awareness for students and the surrounding community.

Article History*Submitted: 2 Desember 2024**Accepted: 10 Desember 2024**Published: 11 Desember 2024***Key Words**Islamic Boarding School,
Medan City, Green
Architecture**1. Introduction**

The evolution and adaptation of Islamic boarding school education have progressed in accordance with the passage of time. Initially, the administration of these schools was overseen by caretakers residing in homes, mosques, and community dining halls, evolving over time into the structured pesantren institutions we see today. Islamic boarding school has several principles that apply, including Tawazun (consideration), tasamuh (tolerance), ukhuwa (brotherhood), and tawasth wal tidal (simplicity), which aim to develop the knowledge and skills of students in the hope of having personality that is influenced by Islamic teachings.

Currently, Islamic boarding schools are no longer perceived as outdated, and their quality of life has been validated through their active involvement in serving the community in various capacities, including contributing to the nation's education through religious institutions. However, according to data from the PAKIS Division of the Regional Office of the Ministry of Religious Affairs of North Sumatra Province, there are only 331 boarding schools distributed across North Sumatra, with just 15 in Medan. Given these circumstances, researchers are motivated to investigate under the title "Designing Islamic Boarding Schools with a Green Architecture Approach in Medan City."

2. Method

Design methods carried out:

1. Study Literature, which is an activity carried out by collecting data from reliable sources to obtain collecting, analyzing, and concluding all data from relevant or similiar written sources. Literatur studies are useful in providing in-depth information related to perspectives on Islamic boarding school architecture.

2. Survey, which is an activity carried out by collecting information though a review of existing site conditions at the design location.

3. Result and Discussion**3.1 Islamic Boarding School**

A dorm where students study the Koran and Islam is called Pondok Pesantren. The terms "Pondok" and "Santri," which have two possible interpretations, are the source of the term Pondok Pesantren. These are as follows: Solemn worshippers are devout individuals. Those that go further into their religious studies travel far. Currently, the word Pondok is interpreted as a place to live side by side, or dormitory, for students who come from distant places. This is what makes Pesantren different from other educational institutions. Santri is not allowed to live outside the pesantren area except for students who come from surrounding villages, thus allowing the kyai to supervise the students intensively.

Zamakhsyari Dhofier (1994) describes pesantren as a traditional Islamic religious education institution that aims to educate and develop pupils into honorable human beings. Then, according to K.H. Abdulrahman Wahid (in Zuhriy, 2011), pesantren has its own uniqueness because of the characteristics of pesantren that are not found elsewhere. Therefore, government agencies should foster and synergize in building equitable regulations, equitable programs, and equitable budgets to ensure that pesantren are not left behind by other government agencies.

3.2 Purpose Of Islamic Boarding School

The decline in moral values among the nation's youth underscores the necessity for character education within society. Such education is crucial for a nation's progress and empowerment. Hence, collective efforts are needed to address these issues. One effective solution is the establishment of Islamic boarding schools, which aim to address these challenges. The objectives of setting up Islamic boarding schools across Indonesia illustrate their potential to tackle these issues, as outlined below

1. Provide education and propagate Islamic knowledge in accordance with the teachings of the Qur'an and Hadith
2. Provide moral education in the form of manners and Instilling the values of devotion to Allah.

3.3 Classification Of Islamic Boarding School

The types of pesantren vary, and each type affects the quality and integrity of the pesantren facilities. According to Manfred Ziemek (Mahfud Juanaedi, 2017), pesantren in Indonesia can be classified into five types:

1. Type 1 boarding school: Consists of a mosque and Kyai's house to teach through wetonan and soronga teaching methods to students who come from the area around the boarding school only.
2. Type 2 boarding school: consists of a mosque, cleric's residence, and dormitory; the teaching system still uses wetonan and soronga, but students have dormitories that can be inhabited.
3. Type 3: consists of a mosque, kyai's house, dormitory, and madrasah that adheres to the traditional system and uses the Wetonan system in its recitation. In this type of pesantren, students who live in the pesantren receive teaching in the madrasah.
4. Type 4 Islamic Boarding School: Consists of a mosque, kyai's house, hut/dormitory, and madrasah, which uses an additional learning system in the form of developing

skills such as in the fields of animal husbandry, agriculture, fashion, culinary, and others.

5. Type 5 Islamic Boarding School: Consists of a mosque, kyai's house, dormitory, madrasah, center of excellence, university, meeting hall, sports field, and public school. This type of pesantren is an independent pesantren that includes a library, shared kitchen, dining room, and guesthouse and already manages junior high, high school, and vocational school

In the design of this Islamic boarding school will be more focused on the fourth type that is thought to be able to meet the needs of its users

3.4 Green Architecture

According to Pradono (2008), green architecture can be defined as sustainable, environmentally friendly, and high-performance buildings (buildings with excellent performance). The concept of green architecture, which has long been developed in developed countries, can be used to reduce air pollution in urban environments.

The main goal of green architecture is to be fully sustainable. Green architecture is also known as sustainable development, eco-architecture, or natural architecture. Green architecture involves a combination of environmental, social, political, and technological values, which seeks to reduce the negative impact of buildings on the environment by increasing efficiency and moderation in the use of building materials, energy, and open space development

It can be concluded; green architecture is an architecture that pays attention to human health and the environment by minimizing negative impacts on the environment, reducing energy use, and protecting existing natural resources.

3.5 Project Description

The location of Islamic Boarding School is located on Jl. Bunga Lau No.27, Kemenangan Tani, Kec. Medan Tuntungan, Kota Medan, Sumatera Utara with a land area of 20.000 m²

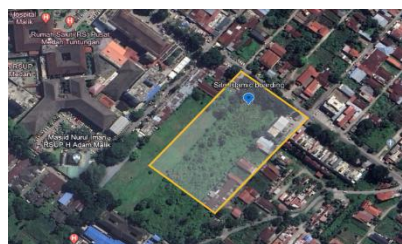


Figure 1 Location

Source: Google

3.6 Mass Concept

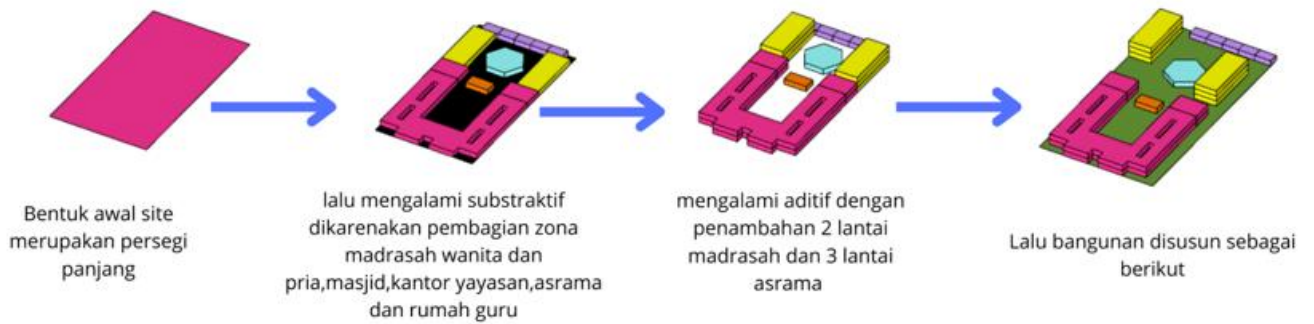


Figure 2 Massing

The building is designed at six different times that are U-shaped to utilize the open space in the middle of the building to get optimal sunlight and can utilize vegetation to optimize the temperature around the building and create a communal area of centrality and teaching power. The pink is the madrasah school, the orange is the foundation building, the yellow is the men's and women's dormitories, the blue is the mosque, and the yellows are the teachers' and kyai's houses.

3.7 Basic Concept

This image shows the site plan of a building complex that appears to be an educational facility or campus. The plan has a north-south orientation with a size of about 200 meters long and 100 meters wide.

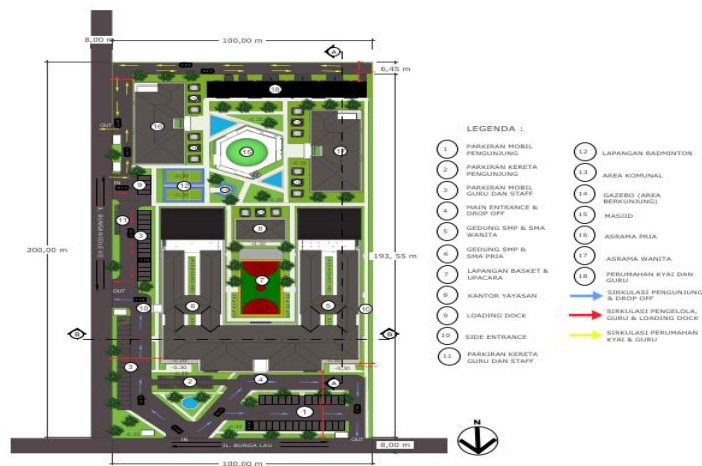


Figure 3 Site Plan

3.8 Zoning

3.8.1 Ground Plan

The complex is designed with an organized and functional layout. In the center there is a large open area with a hexagon-shaped garden surrounded by various buildings and facilities. The garden is the focal point of the overall design, providing a refreshing green space in the middle of the complex. To the south of the main park, there is a red sports court that is most likely a basketball court or a multipurpose court. Major buildings are located around the area, including junior and senior high school buildings, as well as various supporting facilities such

as laboratories, libraries, and classrooms. Access to the complex is provided through several entrances. The main entrance is located on the west side, equipped with a drop-off area. There are also side entrances at several strategic points. Vehicle circulation is well-designed, with roads surrounding the complex and parking areas scattered across several locations.

Other facilities seen in this plan include badminton courts, play areas, female and male dormitories, and multipurpose rooms. The overall design shows attention to the need for green open space, with many green areas and trees scattered throughout the complex.

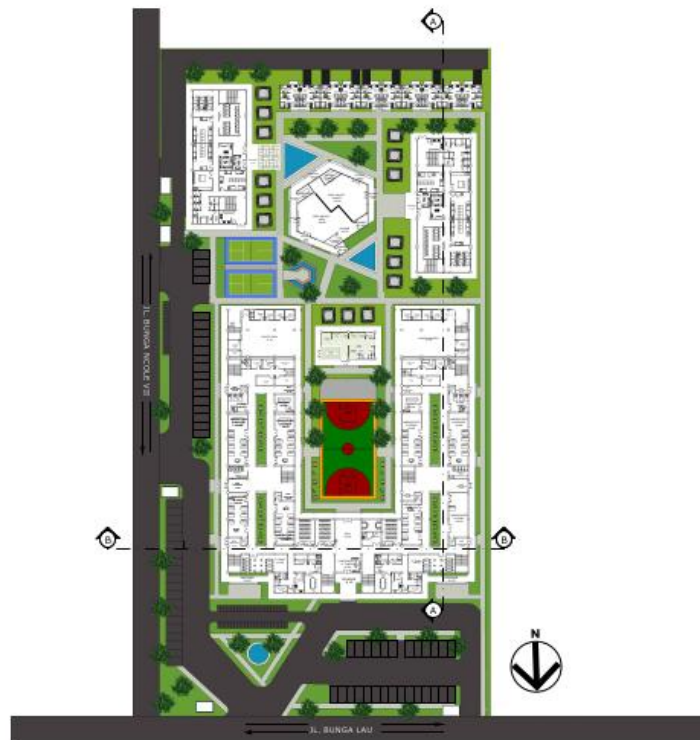


Figure 4 Ground Plan

3.8.2 Second Floor Plan



Figure 5 Second Floor Plan

The second floor of the Islamic boarding school building is divided into right and left wings, the yellow right wing is a junior high and the senior high for a female is separated by a gray void as an air entry area, pink for service area, a hall for female that is colored dark blue,

then for the left-wing colored baby blue is a junior high and senior high for male, and the dark blue area is the hall for male.

3.9 Theme Implementasion

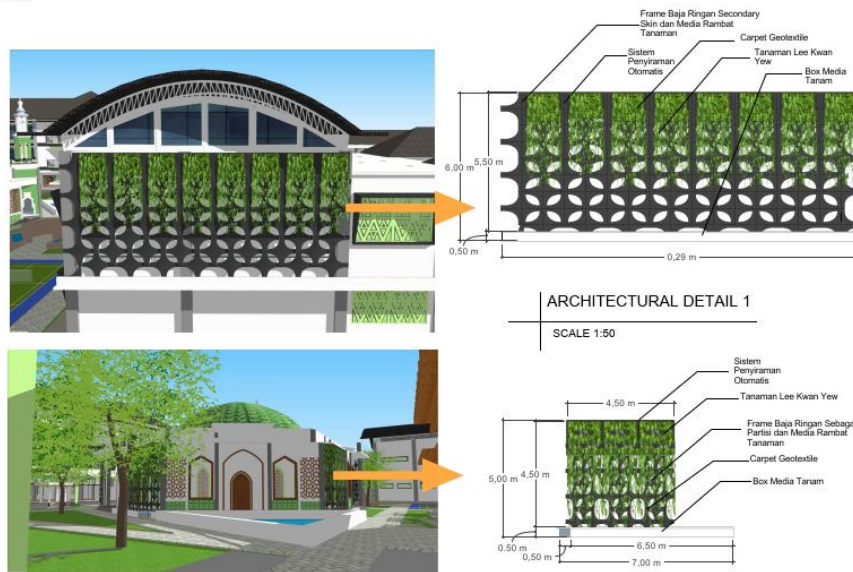


Figure 6 Secondary Skin

Both designs integrate architectural elements with greenery, creating an eco-friendly and aesthetically pleasing façade. The use of vines on building structures is referred to as "green walls", which can help reduce heat, improve air quality, and add to the aesthetic value of the building.



Figure 7 Green Wall

This image features two innovative architectural designs with an emphasis on the integration of green elements in the structure of the building. At the top, a two-story building with a façade that combines geometric panels and vertical plants. The architectural details show the composition of the green wall consisting of light steel frames, geosynthetic carpets,

vertical ornamental plants, vines, and planting media boxes. The building's height is about 7.30 meters.

The bottom of the picture shows a multi-storey building with spacious balconies. The design highlights the use of green open space on each floor, creating terraces overgrown with plants. The architectural details depict the planting system on the balcony, including planting media boxes with drainage, waterproofing layers, and various types of plants. The height of each floor is about 3.00 meters with a green balcony depth of about 2.20 meters.

Designs reflect a modern architectural approach that blends the building's functions with natural elements. The use of vertical plants and balcony gardens not only improves the aesthetics of buildings, but also has the potential to provide ecological benefits such as carbon dioxide absorption, improved air quality, and reduction of urban heat effects. This concept shows efforts to create a built environment that is more in harmony with nature, while improving the quality of life of its residents by providing direct access to green spaces.

4. Conclusion

From the results of the design of the Islamic Boarding School with the Green Architectural Approach, it can be concluded that the choice of location for Islamic boarding School plays an important role in ensuring that Santri and users who will live and learn to teach in it can live well, by choosing areas with a low level of crime so that its users can feel more secure, paying attention to its connection with the surrounding environment so as to create a good relationship between school and hostel and make its inhabitants more comfortable living there, implementing a modern khalaf curriculum that can support santri learning according to the interests of the talent they have, as well as implementing the theme of green architecture by maximizing the use of natural lighting and heating, reducing the usage of chemicals, thus creating a living environment that can support efficient learning activities that triggers a motor sensor to not be too stressful in following learning activities and can be more relaxed while being in this Islamic boarding school.

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