

Maimun Superblock in Medan City With a Green Architecture Approach

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Abstrak

Medan City is faced with urban development problems that result in increased mobility and population density. Urban expansion requires infrastructure development to facilitate economic activities concentrated in city centers. Medan as a major economic center is experiencing rapid growth, demanding adequate facilities for offices, transportation, education, and economic centers. This growth increases population density, reduces available land and increases housing demand. To address mobility, population density, and housing needs, a Mix-Use development model, specifically the Superblock concept that integrates residential, commercial, and recreational spaces with a green environmental perspective, is proposed. Superblok efficiently accommodates high density through vertical construction, emphasizing green architecture for the comfort and enjoyment of visitors, users, and staff. Research methods include case studies, hands-on research, and strategic analysis to determine functional needs, site location, and architectural principles that support specific concepts.

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1. Introduction

Starting from these problems, the construction of a superblock in Medan must take into account the climate and environmental problems of Medan city. A design is needed that can emphasize each function of the superblock and the design should provide a design that can overcome thermal problems and provide flexibility in activities within it. Therefore, a Green Architecture approach will be applied to the Maimun Superblok design.

Medan is one of the main development centers in Indonesia, and the city of Medan is experiencing rapid growth, along with increasing population density. Population growth or population growth rate is increasing every year, especially in big cities such as Medan City. This is why many people choose to live in big cities for work and school. Based on data from the National Health Insurance (JKN) dashboard data, as of March 1 2023, the total population of Medan city was 2,527,050 people. Therefore, the need for housing, offices, transportation, education and shopping centers in the city of Medan must be met in line with the increasing population. The mixed use development model is considered feasible to be developed in Medan, especially in the city center of Medan because of the increasingly high population density in Medan and the need for increased infrastructure and better environmental quality.

Integrated development areas or superblock developments continue to encourage large-scale urban trends in several large cities in Asia. Integrated infrastructure and living environment in metropolitan areas is one of the attractions for city residents to work and carry out commercial activities in superblock areas

2. Literature Review

2.1 Superblock

Superblock or ecological mixed use is an area that combines residential centers (apartments, malls, rental offices, recreation) with development that has a green environmental perspective. Superblock-based area development is one of the many ways to develop efficient development

because it can accommodate high densities with a vertical building concept. In Indonesia, development using the superblock concept became popular in the early 80s (Ernawati, 2010)

The city of Medan, with its various problems and city potential, can adapt the superblock system to form an integrated area. Integrated areas are needed as an effort to streamline city spatial planning by combining residential functions with other functions such as places for work and recreation. With the superblock concept, the integrated area designed can develop further and improve the quality of urban space. According to Wibisono (2010). One of the concepts that is developing is creating controlled zones. This concept was applied in Europe and the United States in the 1920s with various terms. One of them is the Superblock concept. The superblock model is an efficient development model because it can accommodate high density with vertical development.

Table 1 Activities at Superblock.

Activities	Description
Administrative Activities	Activities carried out by managers, workers and professionals involved in the operation and management of the Community Activity Center building are also responsible for its sustainability. Routine inspection activities, building maintenance and building promotions are carried out by the Superblock Building Management.
Residential Activities	A residence is part of a residential area that consists of more than one residential unit. Residential owners can use several facilities provided specifically for apartment users.
Service Activities	The service offered at Maimun Superblock is co-working space. Co-working space tenants will get access to work space that has previously been booked or rented. Tenants can also use the facilities available in this superblock area.
Transportation	This superblock area is also facilitated with commuter rail way public transportation, so that visitors can access this superblock by public transportation without using private vehicles
Commercial Activities	In this superblock there is also a commercial area to provide support facilities for apartment residents, co-working spaces, or those who are just coming to the commercial area to shop

2.2 Green Architecture

Green architecture is not just buildings with lots of trees or parks. Green buildings here emphasize the use and achievement of comfort in buildings by minimizing the use of active systems so that everything is achieved through natural materials and passive ventilation (Ardiani, Y. Mila, 2015). In another concept, it is stated that green architecture is a building that uses as little natural resources as possible, including energy, water, materials, and has negative impacts. Minimal impact on the environment. Green architecture is a step towards realizing sustainable human life (Karyono, 2010). Green architecture is a design process that reduces negative environmental impacts, increases human comfort through efficiency, and reduces energy resource consumption, land use, and effective waste management in the architectural environment (Futurarch, 2008)

Tabel 2 Principles of Green Architecture.

No	Principles of Green Architecture	Designing action
1	Respect for site	Redesignpedestrian as an effort to unite the building withsite around, as well as increasing the existing vegetation onsite.

2	Working with climate	Respond to the afternoon sun by increasing <i>secondary façade</i> in the front area of the building so as to reduce the intensity of excessive sunlight exposure in that area, as well as using a cross ventilation system in the building
3	Conserving energy	Increasing openings or using windows that can be partially opened can reduce energy use such as lights and <i>and</i> during the day, use bright colors inside the building but not flashy to increase the light intensity.
4	Respect for user	Pay attention to the intensity of sunlight entering each hotel room to ensure the comfort of hotel guests.
5	Limiting new resource	Increase the use of materials that come from the environment and can be recycled, such as wood and bamboo, and ensure that each <i>furniture</i> safe for use by visitors and guests
6	Holistic	When the 5 points above are implemented, it can become a building that applies good green architectural principles

3. Methods

3.1 Site Selection

The choice of building planning location will be one of the determinants of the success of development, for that location must be in accordance with the function and the design theme [17]. The location will be designed in Pematangsiantar City with criteria based on existing regulations.

3.2 Design Methods

The current design approach involves a descriptive process where primary and secondary data are gathered and documented from sources such as journals and books. Subsequently, these data are analyzed to derive conclusions relevant to the identified issues [18]. The methodologies employed include defining design concepts, gathering primary and secondary data, analyzing design and site specifics, preliminary design work, and final design outcomes. Data collection involves literature reviews, on-site analysis, and surveys conducted among potential users of the design outcomes.

4. Results and Analysis

4.1 Design Location

The specific location of the Maimun Superblk design site is located on Jalan Mahkamah, District. Medan Maimun, Medan City, North Sumatera. The coordinates are at 2°58'11 "N 99°03'47 "E [], the surrounding utilization is a commercial area.

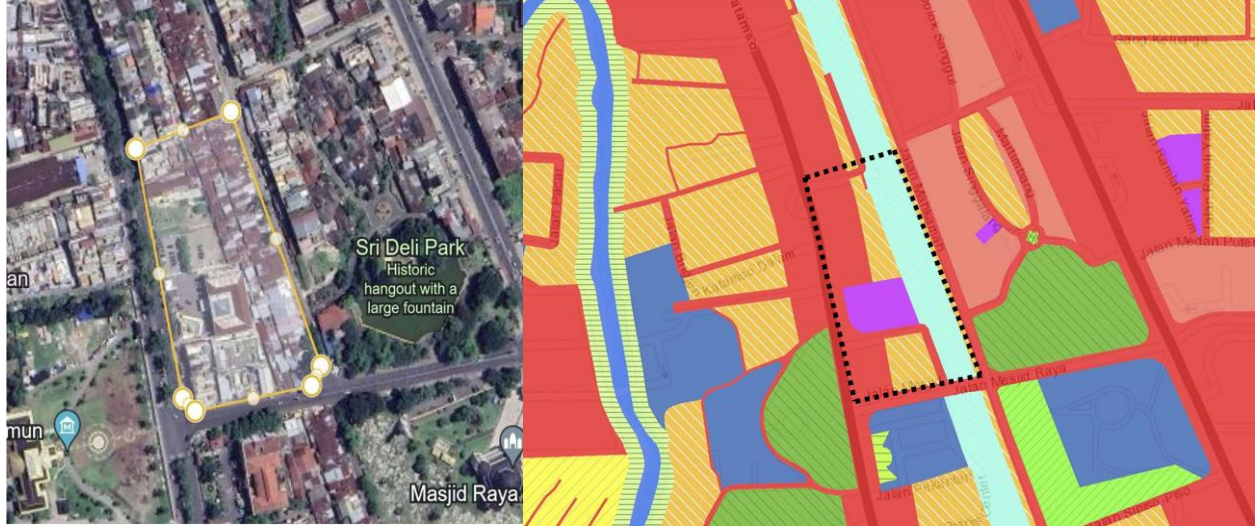


Figure 1 Location in Medan City

Tabel 3 Site conditions

No	Criteria	Condition
1	Land area	2.0 Hectares
2	Slope	-
3	Basic Building Coefficient (KDB)	80%.
4	Basic Green Coefficient (KDH)	20%.
5	Building Area Coefficient (KLB)	8
6	River Frontage Line (GSS)	2,4
7	Building Setback Line (GSB)	-
8	Climate	Tropical

4.2 Concept

Pedestrian Path Concept

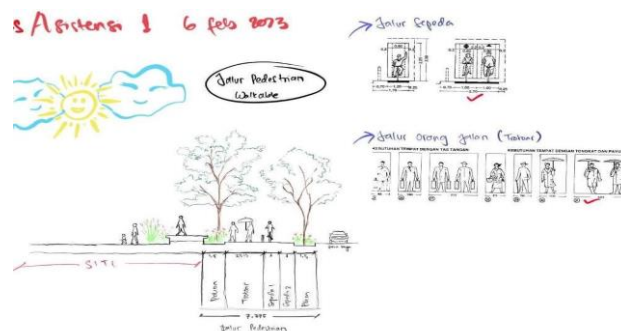


Figure 2 building orientation concept

Pedestrians were built around the entire site to create a walkable pedestrian path for the local community. Quoting from the architect's data book, the dimensions of a comfortable pedestrian path are obtained, namely:

- Pohon 1,5m/ pohon x 2 = 3m
- Sidewalk 2,375 m/ 2 people
- Bicycle 1m / bicycle x 2 = 2m Total = 7,375 m

Vehicles Path Concept

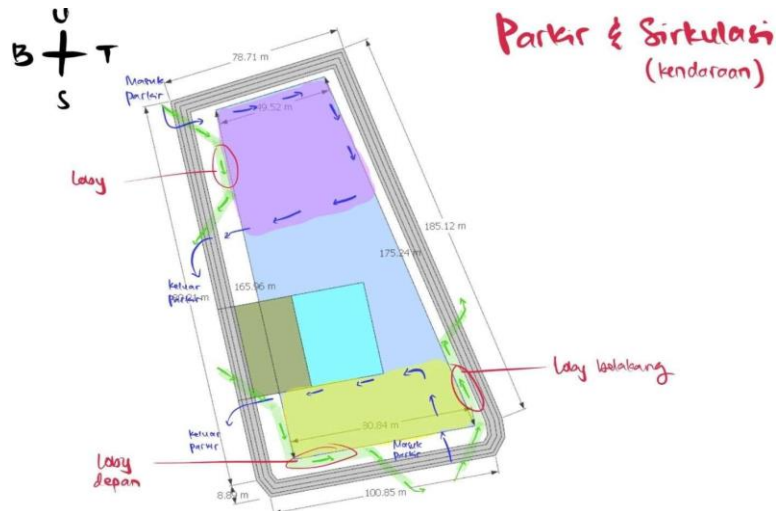


Figure 3 building orientation concept

The vehicle flow is divided into two lanes: one for users accessing the co-working space and apartments, and another for those using the station. This separation considers the area's density during peak commuting times, ensuring smoother traffic flow. It also facilitates quicker access to the station for visitors who are pressed for time, effectively preventing congestion by creating two distinct circulation routes.

Visitor Activity System Concept

Figure 4 Visitor Activity System Concept

Employee Activity System Concept

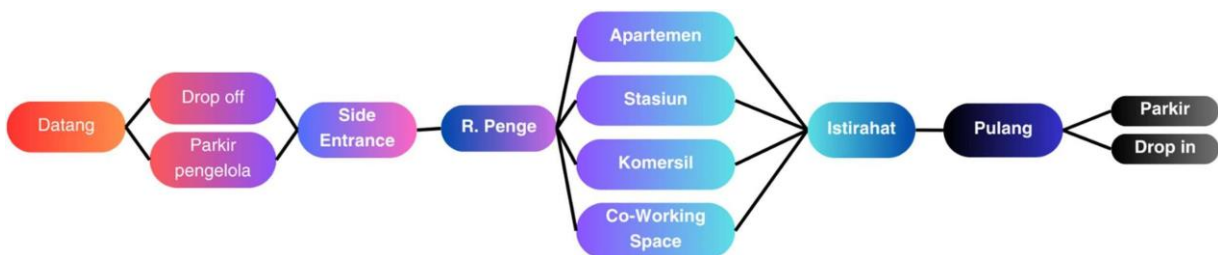


Figure 5 Employee Activity System Concept

4.3 Application of GreenArchitecture

Respect for Site

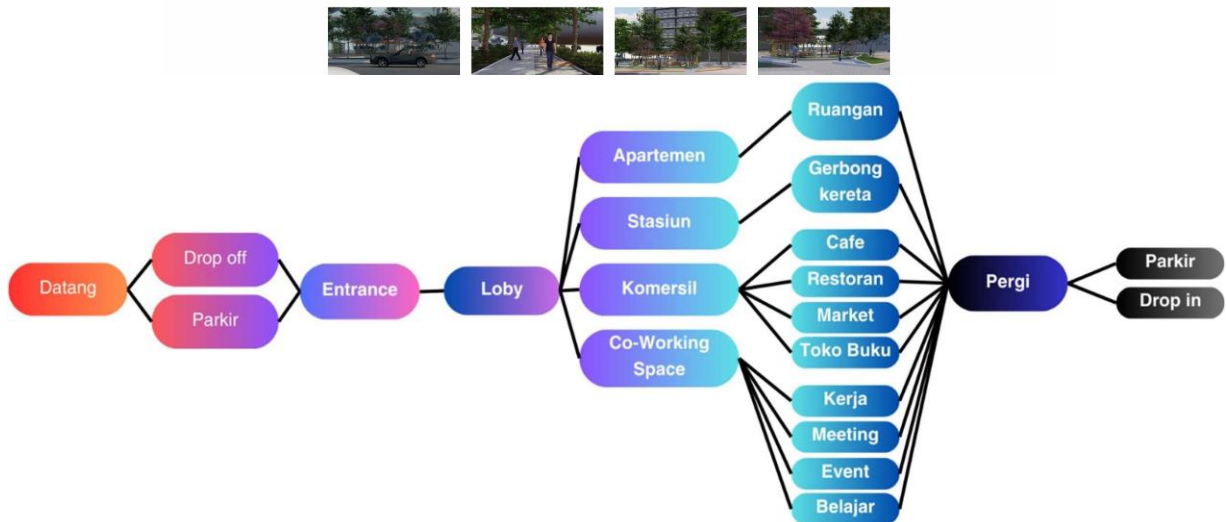


Figure 6 building orientation concept

This superblock design seeks to unite the building with the surrounding site, as well as increase the existing vegetation on the site. vehicle circulation is made as comfortable and clear as possible to facilitate visitors in the superblock.

Working With Climate

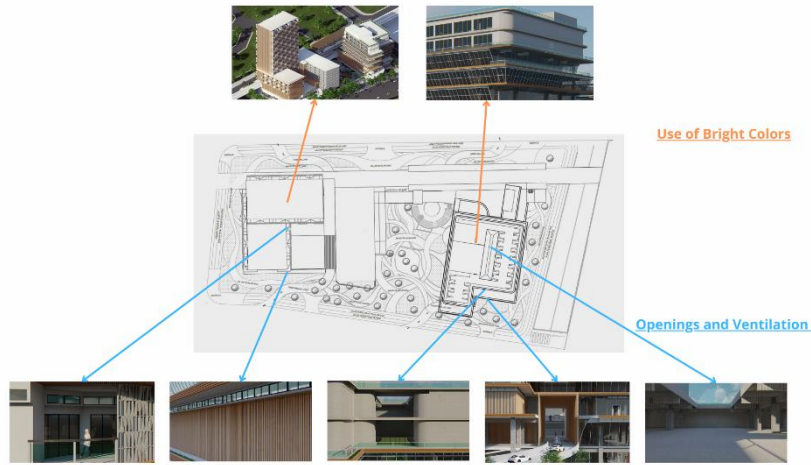


Figure 7 Working With Climate concept

This superblock design responds to the afternoon sun by increasing the use of secondary façade in the front area of the building so as to reduce the intensity of excessive sun exposure in that area. The mass of this superbock building is also made back and forth to create shadows on the part of the building that is exposed to the sun.

Conserving Energy

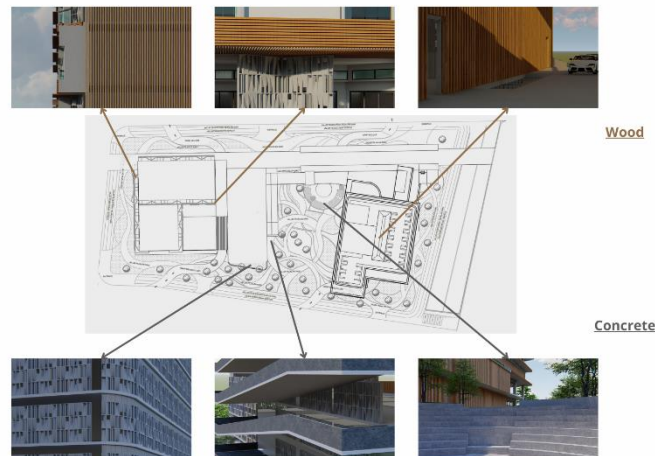
Figure 8 Conserving Energy concept



This superblock building has many openings and uses windows that can be partially opened which can reduce energy use such as lights and during the day. building paint uses bright but unobtrusive colors to increase the intensity of light and minimize heat absorption into the building. in the middle of this building there is also a large enough vent, which can channel air into each room in the building properly.

Limiting New Resource

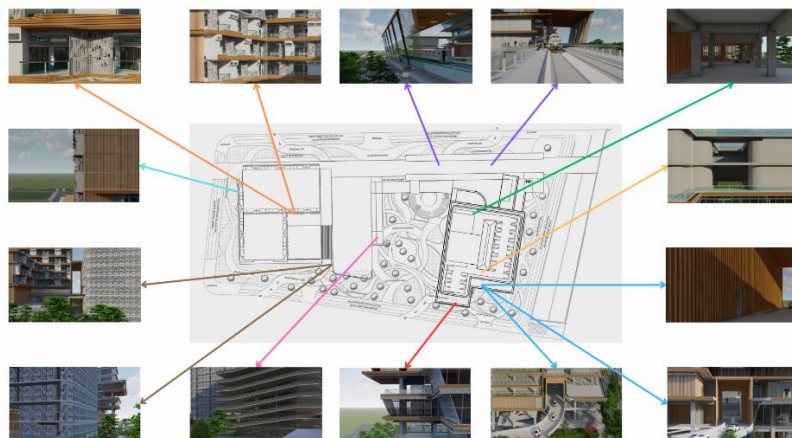
Figure 9 Limiting New Resource concept



The materials used in this building come from the surrounding environment and can be recycled, such as wood, concrete and glass that are safe for use by visitors and guests.

Holistic

Figure 10 Holistic concept



This superblock building is interconnected so that each building function is interconnected and can be reached easily and safely. Building design considers comfort, safety, environment and other aspects of green architecture so that this building can minimize negative impacts, and can have a positive impact on users and the surrounding environment.

References

- [1] Muhammad Al Fadli, Cut Nur'aini, Husni Thamrin, Desain Superblok Mixed Use (Apartmen, Mall, Retail Office) Di Medan Dengan Konsep Arsitektur Ekologis, *Jurnal Arsitektur Purwarupa*, Vol.3, No. 1, March 2019. Page 89-94.
- [2] Arsitur.comstudio, Pengertian Green Architecture, Prinsip dan Contohnya, June 2024 [Online], Available: https://www.arsitur.com/2017/09/pengertian-greenarchitectureprinsip.html#google_vignette (Accessed June 2024).
- [3] Ilmuteknik, Pentingnya Arsitektur Hijau dalam Membangun Lingkungan yang Berkelanjutan, Mei 2024 [Online], Available: <https://ilmuteknik.id/pentingnya-arsitektur-hijau-dalam-membangun-lingkungan-yang-berkelanjutan/> (Accessed June 2024).
- [4] Kompasiana, Transformasi Kota Medan Menuju Kota Kreatif: Potensi dan Tantangan, June 2023 [Online], Available: <https://www.kompasiana.com/yogideparii/647c768b08a8b51b7519cf72/transformasi-kota-medan-menuju-kota-kreatif-potensi-dan-tantangan> (Accessed July 2023).
- [5] BLKP, Mengenai Mixed Use Building, Bangunan Multifungsi Pilihan Kaum Milenial dan Gen Z, 2020 [Online], Available: <https://blkp.co.id/blogs/detail/mixed-use-building> (Accessed January 2024).
- [6] Green Building Council Indonesia, Menara BCA PT Grand Indonesia, December 2014, [Online], Available: <https://www.gbcindonesia.org/certbuilding/0a421c4e63b74da49392b8884c11d7c5ZUUicJ0C0i> (Accessed September 2023).
- [7] Bada Pusat Statistik Kota Medan, Jumlah Penduduk Kota Medan, 2023 [Online], Available: <https://medankota.bps.go.id/indicator/12/31/1/jumlah-penduduk-kota-medan-menurut-kecamatan-dan-jenis-kelamin.html> (Accessed September 2023).

