



# A Study on the Application of Tropical Architecture in the Design of a Serviced Office in Medan Sunggal Sub-District

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**Abstract.** The design of a rental office in the sub-district of Medan Sunggal is a design for a rental office located in one of the business centres in the city of Medan, precisely in the sub-district of Medan Sunggal with the theme of tropical architecture. The problem that business actors or novice freelancers often face when trying to take independent steps to open new jobs due to Indonesia's low level of employment is worrying about the high cost of office rentals like conventional office rentals in general. This rental office implements a serviced office system (office ready to use) which aims to make it easier for tenants, especially in terms of finances. The settlement method used is the descriptive method used in the design based on analytical reasoning and empirical structural research, along with identifying things that support the method. The use of a tropical architectural theme refers to the climate of Medan, which tends to be tropical and can be utilized by maximizing energy savings from natural sunlight. This rental office is expected to be good news for business actors, freelancers, and stakeholders in overcoming problems regarding the need for rental offices in the Medan Sunggal sub-district.

**Keywords:** business, Medan Sunggal, serviced office, tropical

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## 1. Introduction

The low level of employment in Indonesia forces every Indonesian to dig deeper to earn an income. A researcher from the Institute for Development of Economics and Finance (INDEF), Ahmad Heri Firdaus. Heri said that the biggest problem with the high number of unemployed in Indonesia was the imbalance between the workforce and the availability of jobs.

The currently available job opportunities are considered to be still limited and cannot match the growth rate of the labour force. "The number of unemployed people is now 7.05 million, but a year earlier it was only 7.00 million. This means an increase of 0.5 million people" [1]. In

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responding to these problems, few Indonesian people are trying to take independent steps in opening a business or becoming a freelancer rather than applying for a job at an agency due to the limited number of job opportunities from year to year.

Freelancers, in this case, can be in the form of service workers, professional workers, and business workers. In opening a business, whether in business, start-up, property, and so on, it is necessary to have a forum that functions as a place to meet clients, discuss with members, and other administrative matters. Likewise with freelancers, even though freelancers often work in different areas, freelancers also need a permanent place to take shelter so that clients can quickly meet and discuss when required.

However, in this case, the price for renting a conventional office tends to be relatively expensive and burdensome for small business start-ups as well as beginner freelancers. This has resulted in freelancers choosing to build private offices and be occupied privately, which impacts the competition in the use of urban space and the physical appearance of city facilities which causes the land to be increasingly limited prices to be higher.

The serviced office (ready-to-use) is a forum for new business start-ups and novice freelancers to overcome this problem. "Serviced Office is an office that is managed and equipped with facilities such as an office in general by the manager of the Serviced Office/office provider, who then rents out the office or floor, on a medium or large scale, to other companies" [2].

Serviced offices, in general, offer complete office services such as office equipment (cupboards, tables, and chairs), telephone numbers, internet, to meeting rooms. More flexible rental terms and many packages offered, serviced offices cut operational costs compared to conventional offices. With a relatively more affordable price, new business entrants and novice freelancers can have a place to work without reducing land by building a private office.

The benefits of renting a serviced office include: no establishment fees, flexible rental period, usually 6-12 months, flexible office size (according to the number of people), ready to use can be occupied immediately, front office and maintenance staff is set up, monthly office overhead is low (office rental only), the telephone is plugged in and available, and high-speed internet is available [3].

Medan is the number 3 most significant city in Indonesia with a relatively dense national and international business traffic, no less than other big cities such as Jakarta, Bali, Bandung, Makassar, Balikpapan, Surabaya, and Serpong. Medan is also known as the centre of government and business activities for the western region of Indonesia. Its strategic location, close to the State of Singapore, and Malaysia is the value of the city of Medan itself.

So it is not surprising that Medan has emerged as a centre for palm oil, travel, and plantation businesses [4]. With the strategic location of the rental office, because it is located in one of the city centres in the city of Medan, precisely in the Sunggal sub-district, the rental office is increasingly being eyed by stakeholders to serve as a place for doing business. Indonesia is a tropical country because it is located around the equator.

The tropical climate itself means that the weather is warm all day, and there is no winter [5]. The tropical architectural approach is considered suitable for rental offices in the Medan Sunggal sub-district, which also has a tropical climate. The rental office will be more energy-efficient and environmentally friendly by utilizing direct sunlight as natural lighting and an energy source. To reduce excess heat from the sun, the rental office can be equipped with a buffer in the form of natural vegetation or sun shading.

With the presence of a rental office design project in the Medan Sunggal sub-district, it is hoped that it can be a solution for small business people and novice freelancers to have a place to work and not reduce the amount of land available. As well as being a business field for stakeholders in the Medan city area.

## **2. Literature Review**

The terminology title discusses the meaning of a word to understand the goals and objectives. The title of this project is "Design for Rent Office in Medan Sunggal District with Tropical Architecture Theme." Here is the description: Design; according to the Big Indonesian Dictionary (KBBI), design is the process, method, act of designing [6]. Office, an office (an adaptation of the Dutch "kantoor," which is derived from the French Comptoir) is a designation for a place used for commerce or a company that is run regularly" [7];

According to Cyril M. Harris in his book "Dictionary of Architecture and Construction," an office is a building used for professional or administrative purposes. No part is used for residential purposes, except by guards and office cleaners [8]; according to Moekijat, the office is any place that is usually used to carry out administrative work, with whatever name the site may be given [9]. Rent, according to the KBBI (Big Indonesian Dictionary), rent is the use of something by paying money;

Money paid for wearing or borrowing something; fare; transportation cost (transport); which can be used after being born with money [10]. Office rentals, "according to Hunt, W.D. in Marlina, a rental office is a building that accommodates business transactions and professional services [11]. Marlina further explained that a rental office is an office facility that is grouped in one building as a response to rapid economic growth, especially in big cities (industrial development, building/construction, trade, banking, and others)" [12].

Medan Sunggal Sub-District, Medan Sunggal Sub-District is one of 21 sub-districts in Medan, North Sumatra, Indonesia [13]. Tropical architecture is located in the tropics, has adapted to the tropical climate, and provides a natural response to the tropical climate. Tropical architecture provides answers/adaptations of building forms to the influence of the low environment, where the tropical environment has a particular character caused by the sun's heat, high humidity, rainfall, wind movement, etc.

This includes using materials that characterize local materials (tropical areas) more suitable than imported materials. While the humid tropical climate is characterized by several climatic factors: high rainfall around 2000-3000 mm/year, solar radiation is relatively high, around 1500 to 2500 kWh/m<sup>2</sup>/year, the air temperature is relatively high for cities coastal areas or lowlands.

The wind speed is relatively low in towns and places in the lowlands, around 18 degrees to 28 degrees or lower with high humidity (Jakarta between 60 to 95%). Tropical architectural design is a building style that suits the environment in the tropics. This style has several characteristics that make it look identical and an option for a comfortable residence. Tropical architectural design features, It has a roof that is wide enough to reduce the tamper effect of rain accompanied by wind.

In addition, it also withstands direct sunlight that enters the building; building layout and building orientation arrangements (tropical buildings usually avoid making windows in the east and west because it will make the room hot); use of shade or shading placed on the open or window to prevent the entry of heat; expansive windows/openings in tropical architecture allow sunlight to enter the building and provide natural light during the day;

Has holes for cross ventilation so that the temperature in the room can remain comfortable; using a shady garden (tall plants that accompany the building aims to help shade the building in the hot sun and as a conditioner and oxygen provider for building occupants).; in certain areas, houses on stilts become a powerful main feature to anticipate natural disasters and the threat of wild animals;

Use of materials resistant to hot and rainy weather (Materials in tropical buildings must be strong, insulate the heat, and not be easily damaged by rainwater); tropical designs generally use natural materials whose sources can be found in the vicinity [14].

Here are some examples of buildings that apply the concept of tropical architecture: Tropical Office, Ho Chi Minh, Vietnam (Figure 1); responding to Vietnam's tropical climate, this proposed office building uses a "tropical double skin" to obtain moderate heat while increasing the acoustic resistance of the noisy streets of Ho Chi Minh City. This design comes from Inrestudio and proposes using "tropical double skin" as an "alternative office design for tropical urban environments.

The system of modules on the facade support planters is filled with various plants and trees, providing a kinetic shadow to the interior of the building. The inner layer of glass and the outer layer of greenery define this system. Greenery, which is easy to care for in tropical environments, reduces heat and water penetration and noise through the facade. This project proposes a new typology for office buildings in low urban environments.

Despite the hot and humid climate, most office buildings in Vietnam are constructed using glass facades which are more suitable for temperate climates. Commonly used single-glazed glass facades have three main drawbacks in Vietnamese cities: large amounts of heat gain increase energy consumption due to the need for air conditioning; flat glass details have a significant risk of rainwater leakage; Thin glass partitions offer poor acoustic resistance to noise pollution from the street. On the other hand, double glazed facades are rarely seen in Vietnamese cities, partly due to the lack of high thermal insulation in winter [15].



**Figure 1** Tropical Office, Ho Chi Minh, Vietnam

(Source: <http://www.archdaily.com> [18])

Zayn Tower, Khartoum, Sudan (Figure 2); the tower that houses Zain's headquarters in the Sudanese capital towers over the city, cutting a slender symbolic figure over the horizon. The monolithic structure gradually rotates as it grows in distinct movements that contrast with the surrounding urban landscape. Like a watchtower, the building dominates the skyline expressing its communicative nature and becoming an urban landmark.

Zain Tower is located on 15th street in Al Amarat district, a popular residential area in the centre of Khartoum close to the airport, surrounded by restaurants, hotels, and several embassies. The building breaks the regular rhythm of urban fabrics, which are arranged in a fixed grid, by inserting diagonal cuts into the corners of the plot and providing space for a public square. This welcoming motion on the ground floor produces an upward movement that emphasizes the shape of the building, twisting to realign itself with the urban fabric above.

The resulting shape defines a large podium at the bottom for the telecommunications company's main store and twelve floors of offices above it for its headquarters, which enjoys superb views of the city. A typical floor plan of a tower is a simple twenty-by-twenty meter square-cut only by a central core containing the elevator and stairs, bound in the centre of each rotating plate. The open plan allows for a versatile space distribution, enclosed by orthogonal facade glass walls [16].



**Figure 2** Zayn Tower, Khartoum, Sudan  
(Source: <https://aqso.net/> [19])

### 3. Research Methods

The location selection must meet the requirements and criteria that have been determined. After all, are met, proceed with selecting and choosing using google maps/earth. After the location is found, it is continued by conducting a field survey to see the original condition of the site and the condition of the surrounding buildings.

The settlement method used in the design of the rental office in the Medan Sunggal sub-district uses a descriptive way, which is used in the design based on analytical reasoning and empirical structural research, along with identification of things that support the method. In this descriptive method, several stages are carried out, namely: idea Search, data collection, analysis, concept, the final result [17].

### 4. Result and Discussion

#### 4.1. Design Location

The general data of the project to be designed are as follows:

Title: Design for Rent Office in Medan Sunggal District, Project Location: Jalan Gatot Subroto, Medan Sunggal District, Medan City, North Sumatra, Indonesia, Project Theme: Architecture, Site Area: +/- 1.5 Ha (15,000 m<sup>2</sup>), KDB: 60%, KLB: 6, KDH: 20%, Existing Condition: Empty land, Project Status: Fictitious

Site Boundaries (Figure 3): Northside, Medan Helvetia District; Eastside, Medan Petisah District and Medan Baru District; Southside, Medan Selayang District; West Side, Deli Serdang Regency.

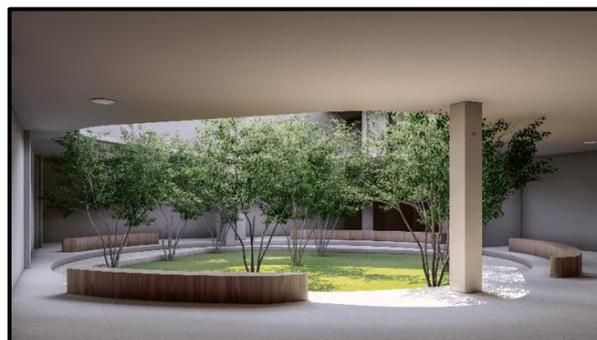


**Figure 3** Site Boundaries

#### 4.2. Basic Concept

The concept of Designing a Rental Office in Sunggal District is to design a rental office with a serviced office system (office ready to use) that can adapt to the tropical climate and take advantage of the tropical climate as a natural energy source. The rental office is designed to be comfortable so that people active in this building feel at home and are happy to spend their time in this building. This building maximizes natural light and ventilation and strives for energy savings with a tropical architectural approach.

The following are some of the applications of the theme "Tropical Architecture" in the Design of a Rental Office in Medan Sunggal District: put the inner courtyard on the building (Figure 4), maximizing natural light as an energy source in the atrium of the building (Figure 5), the use of solar panels as a backup energy source, presents many openings in the building, application of roof gardens and sky terraces, apply sun shading on the sides of the building (Figure 6).



**Figure 4** Inner Court Yard In Building



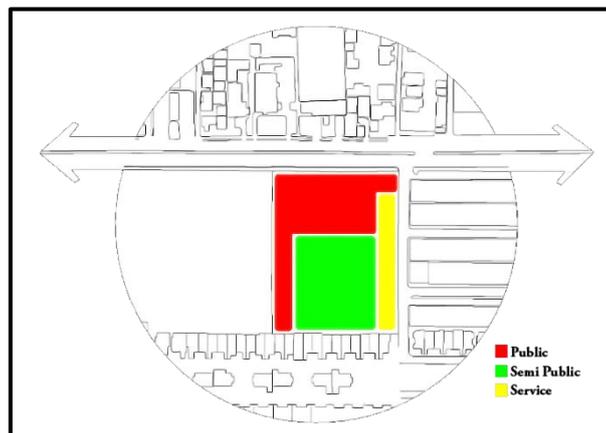
**Figure 5** Maximizing Natural Light As An Energy Source In The Atrium Of The Building



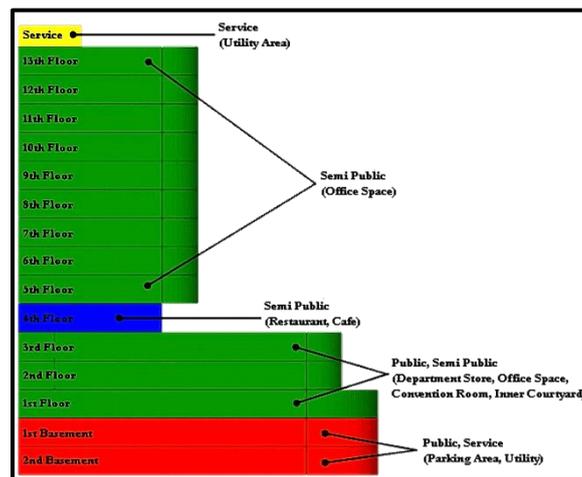
**Figure 6** Apply Sun Shading On The Sides Of The Building

#### 4.3. Zoning Concept

There are two types of zoning concepts in buildings: vertical and horizontal zoning (Figure 7 and Figure 8).



**Figure 7** Horizontal Zoning

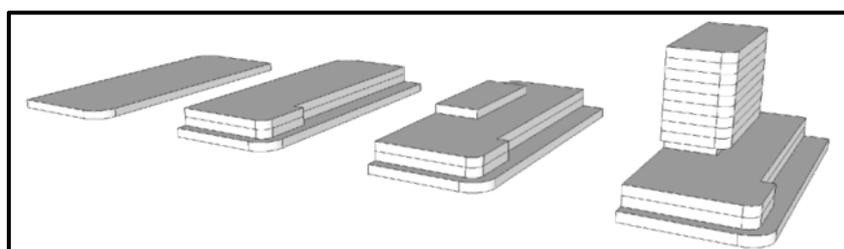


**Figure 8** Vertical Zoning

#### 4.4. Mass Concept and Appearance

The basic formation of the mass (on the podium on the 1st floor) is a rectangular shape patterned on the two diagonally. Then (on the 2nd and 3rd floors), it was added with the same form but with a smaller scale and was styled on the podium side of the rental office building to emphasize further the difference in facades between department stores and rental offices. Then (on the 4th-floor tower), a rectangle is added, smaller than the top formation, which will function as a restaurant (indoor and outdoor areas).

Moreover lastly (on the tower floors 5-13), several rectangular shapes were added, which were more significant than the previous shape and were cut at the two ends, which functioned as a rental office area (Figure 9). The following is a visualization of the design project in the form of Building Perspective (Figure 10), Department Store Entrance (Figure 10), Serviced Office Entrance (Figure 11), Serviced Office Entrance (Figure 12), Lounge Area (Figure 13).



**Figure 9** Mass Transformation



**Figure 10** Building Perspective



**Figure 11** Department Store Entrance



**Figure 12** Serviced Office Entrance



**Figure 13** Lounge Area

## 5. Conclusion

The need for rental offices both at the centre of trade and industry in Medan is increasing day by day. Apart from saving new land, the existence of a rental office also does not eliminate the

aesthetics of the urban spatial structure. Mainly if office's location is located in the city centre of Medan, which is surrounded by commercial buildings. However, the cost of renting a conventional rental office is considered burdensome, especially for entrepreneurs who are still starting a new business or freelancers who wish to have an office (office) as a place to gather, discuss, and communicate with clients but only want to rent an office with a short timeframe.

Short, which is not found in conventional rental offices in general. The design of a rental office in the Medan Sunggal sub-district is a solution to these problems. With a more affordable cost and a more flexible rental period, this building is expected to overcome all of the issues experienced by new entrepreneurs and freelancers. The facilities available immediately after renting an office, such as office equipment, telephone numbers, internet, and meeting rooms, can be more attractive for young entrepreneurs and freelancers.

Located in the sub-district of Medan Sunggal, which has a tropical climate throughout the day, this building is designed to adapt to the tropical climate and maximize natural energy sources that come from the tropical climate. The inner courtyard, atrium, and sun shading on each side of the building open utilize the tropical climate applied to the building. With all these aspects, it is hoped that the design of a rental office in the Medan Sunggal sub-district can be a solution for the increasing need for rental offices in Medan City.

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