

Designing Youth Center in Medan City with Green Architecture Approach

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Abstract (English)

Medan, a major city in Indonesia, has a substantial youth population. To foster positive development and prevent negative activities among adolescents, a dedicated space is essential. Hence, the Youth Center was established to create a comfortable and quality environment where youths can develop their talents and skills. The Youth Center offers sports, arts, and other supportive facilities designed to promote positive activities. Its main goal is to enhance the capabilities and potentials of adolescents, aiming to cultivate a responsible and high-quality younger generation through its facilities and programs.

Article History

Submitted: 19 August 2024

Accepted: 28 August 2024

Published: 29 August 2024

Key Words

Youth, Potential, Talent, Green Architecture

1. Introduction

Adolescence is defined as the transitional period from childhood to adulthood, marked by significant physical, cognitive, and socio-emotional changes (Santrock, 2003) (1). According to the World Health Organization (WHO), adolescence spans from ages 10 to 19 years. Meanwhile, Indonesia's National Population and Family Planning Board (BKKBN) defines adolescence as ranging from 10 to 24 years(2).

During adolescence, individuals experience rapid growth and development, both psychologically and physically. Erikson describes this period as one of identity crisis, where adolescents seek and form their own identities (3). This characteristic makes adolescents highly dynamic, critical thinkers, and vulnerable to environmental influences. This period should be leveraged as a golden opportunity to make significant contributions to national development. However, challenges arise when adolescents struggle to adapt to internal and external changes and lack guidance towards positive activities, often leading to deviant behavior or juvenile delinquency (Sumara, Humaidi & Santoso, 2017).

According to the Central Bureau of Statistics (BPS), cases of juvenile delinquency have been rising each year. In 2018, 3,145 youths under the age of 18 were involved in delinquent and criminal behavior, and this number increased to between 3,280 and 4,123 in 2019 and 2020. In 2021, cases of juvenile delinquency in Indonesia sharply increased to 6,325, representing a 10.7% rise from 2018 to 2021. This trend indicates a continuous increase in juvenile delinquency over time, with cases involving theft, free sexual behavior, violence, and drug abuse(4).

Based on data from BPS, Medan has approximately 580,771 adolescents out of a total population of 2,435,252 people (5). Given the high number of adolescents and their developing interests and talents in various aspects, there is a need for a facility that serves as a place for them to engage and create. However, there is currently no facility

in Medan that can adequately accommodate the majority of adolescents' interests and talents. Existing facilities are fragmented and insufficient in providing the necessary infrastructure to support various youth activities.

Therefore, there is a need for a facility that can nurture and develop the talents and skills of adolescents in Medan, also helping them to build a positive outlook for their future. A Youth Center in Medan is expected to accommodate youth activities according to their individual interests and talents. The Youth Center will function as a hub for community and youth activities, aiming to enhance their interests and talents. Additionally, the Youth Center can serve as a place for adolescents in Medan to socialize, interact, and develop their organizational skills. Indirectly, they will be guided towards educational and mental development. Thus, it is hoped that the Youth Center will be a representative facility in fostering and accommodating the creativity of adolescents in Medan.

2. Method

The initial phase of this project involved studying how green architecture could be effectively applied to the Youth Center building. The author conducted a diverse literature review and collected primary and secondary data regarding the design of this Youth Center. Subsequently, efforts were made to explore green architectural elements within the Youth Center. The analysis of the Youth Center resulted in determining the types of facilities and spatial dimensions to be incorporated into the building. Green architectural elements identified from the analysis included site processing, spatial treatment for user comfort, energy conservation measures, use of environmentally friendly materials, and maximizing natural lighting and ventilation. Ultimately, the combination of spatial requirements and green architectural elements resulted in a Youth Center building designed with a green architecture approach.

The initial process of site selection began with reviewing the regulations of the Medan City Regional Spatial Plan for 2010-2030 to ensure the suitability of the building's function. The selected location was chosen based on strategic considerations and criteria supporting green architecture principles. Based on this data, the author selected a site located at Jl. Perintis Kemerdekaan, Medan Timur, North Sumatra, Indonesia.

3. Result and Discussion

3.1 Project Description

The location for the Youth Center project is Jl. Perintis Kemerdekaan, Medan Timur, North Sumatra, Indonesia. This site is highly strategic as it is centrally located in the city. Currently, there are no buildings functioning as a youth center nearby, making this site highly suitable for constructing such a facility. The Youth Center will support various educational activities, especially given the presence of numerous schools and universities in the vicinity. The site covers an area of 19,000 m².



Figure 1 . Project Location

Source: Google Earth

3.2 Mass Concept

The initial concept is inspired by the basic shape of the site, which is triangular. This triangular form is modified subtractively and divided into three parts, corresponding to the three main functions that will be present in the Youth Center. These functions may include areas for sports, arts, and supporting facilities. An additive and subtractive process is applied to the building to avoid monotony and create a more dynamic visual experience. This approach also aims to enhance circulation among the building masses, allowing users to move easily from one area to another. Several additions are made to create a harmonious building that responds to the site analysis findings.

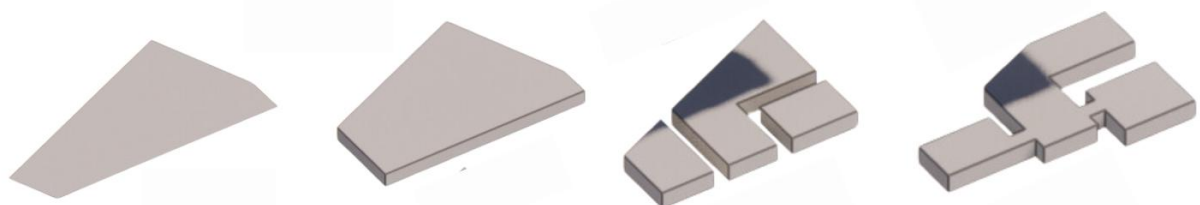


Figure 2. Massing

3.3 Basic Concept

This Youth Center consists of 3 floors with various facilities. On the first floor, there are 4 types of facility zones. The red area is the sports area, which includes a gym. The yellow area is the reception and management area, as well as several public and artistic areas such as exhibition spaces. The orange area is the supporting/multi-purpose area for holding certain events or functions, and the blue area is the commercial area consisting of a cafeteria and shops selling equipment that supports sports and artistic activities, as well as service areas located within this zone.



Figure 3. First-floor zoning

There are three facility zones on the second floor of this Youth Center. The red area is the sports facility area, which includes a badminton court, a gaming area, a table tennis area, and a billiard area. The yellow area is the arts area, which includes music studios, dance studios, painting classrooms, and several co-working spaces. Meanwhile, the blue area is the commercial area that functions as a library.

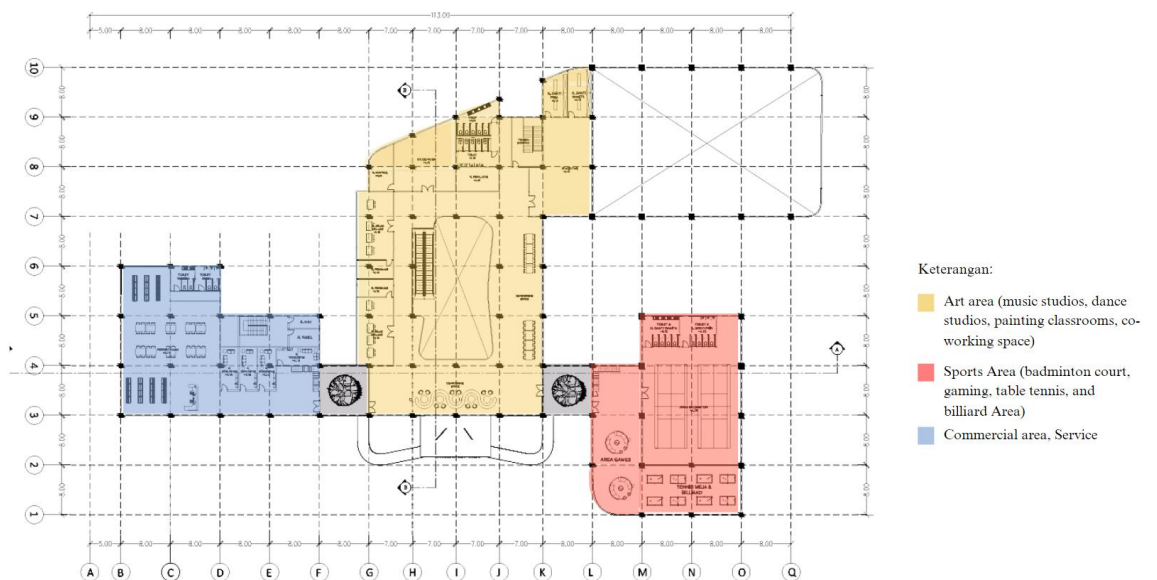


Figure 4. Second-floor zoning

On the third floor of this Youth Center, there are two facility zones. The blue area is for virtual golf sports, while the green area is a roof garden.

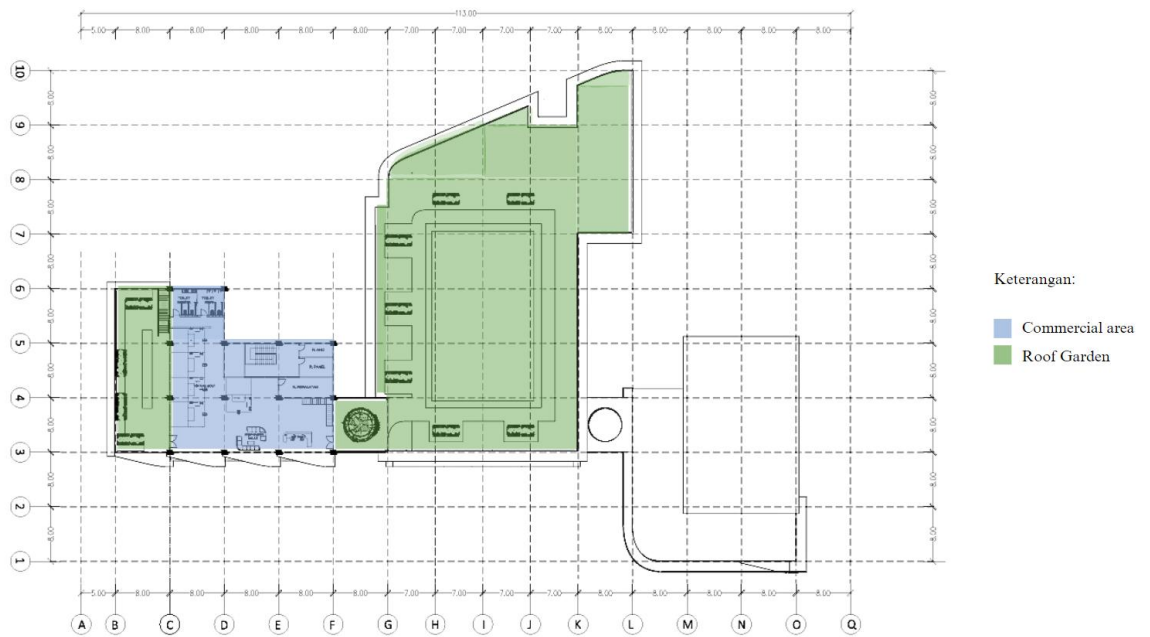


Figure 5. Third-floor zoning

3.4 Facade Concept

The north facade of the building faces the main road, Independence Pioneer Street. This facade features numerous openings to maximize natural light entering the building. However, it also uses overhanging roofs, canopies, and secondary skin in certain areas to reduce excessive heat.



Figure 6. North elevation

The east facade of the building faces the vehicle parking area. Since the east and west sides are the most exposed to direct sunlight, this facade uses many wooden secondary skins to minimize direct sunlight entering the building.



Figure 7. East elevation

The west facade of the building also uses many wooden secondary skins to reduce the heat directly entering the building.



Figure 8. West elevation

The south facade of the building is the rear area. In this part, there is an entrance to the building, with the use of overhanging roofs and some secondary skins in certain areas. The wall material used on all sides is brick.



Figure 9. South elevation

3.5 Application of Green Architecture

3.5.1 Respect for Site

The building is oriented to face north, maximizing the natural light entering the building while avoiding excessive sunlight from the east and west sides (6) . Then provide bus stops and pedestrians to make it easier for users to get to the site.



Figure 10. Site Plan

Maximizing green areas on the site ensures that the surroundings of the Youth Center have good air quality. The green areas inside the building are designed as

communal spaces and pedestrian zones, with the use of green roofs in various parts of the building.



Figure 11. Green areas

3.5.2 *Respect For Users*

Another approach is to design the building according to its functions. The building is divided into 3 interconnected functions, allowing users to easily access the respective spaces within the building. Additionally, each function is connected by open corridors adorned with plants along each corridor.



Figure 12. Corridor

3.5.3 *Conserving Energy*

- The use of LED lights due to their high efficiency by using much less energy than other lights to produce the same amount of light
- The use of skylights aims to allow natural light to enter the building, thereby reducing the use of electrical energy for interior lighting(7).

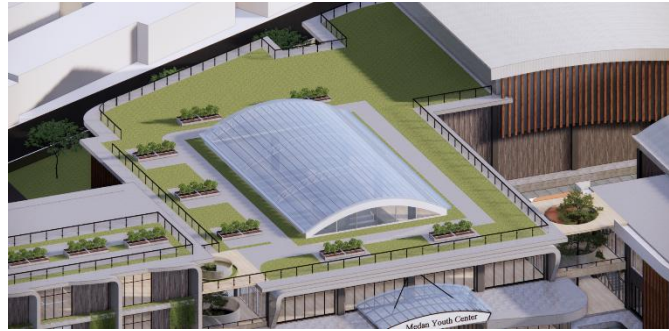


Figure 12. Skylight

- The use of green roofs aims to cool the rooms beneath them, thereby reducing the energy demand for heating and cooling as well as decreasing pollution and noise(7).

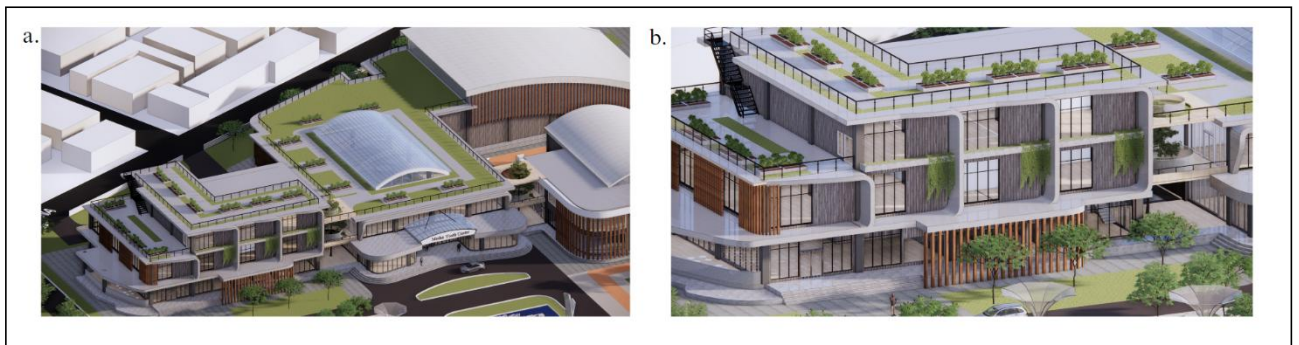


Figure 13. (a) Green Roof; (b) Garden roof

- The use of overhangs and secondary skins is mainly in the west and east of the building.

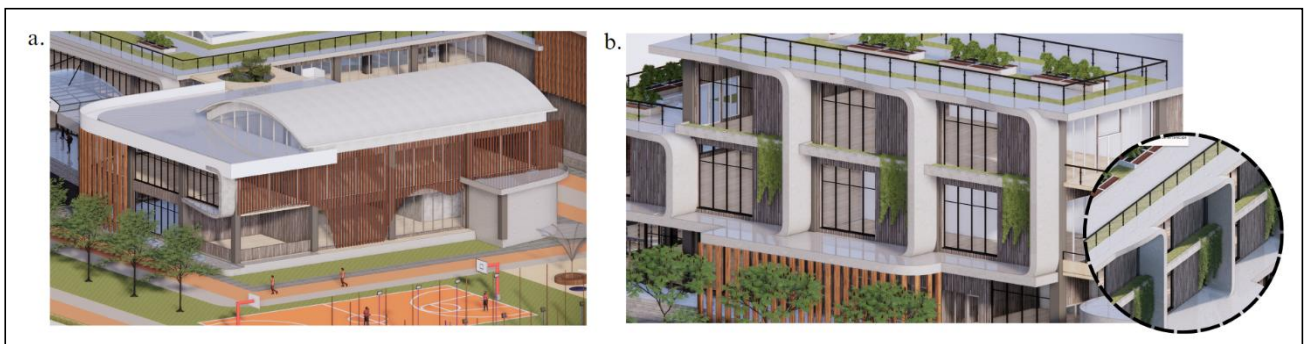


Figure 14. (a) Secondary skin; (b) Overhangs

- The application of canopies in the area can also be used for rainwater harvesting, serving as water conservation and aesthetic elements as well.



Figure 15. Rainwater Harvesting

3.5.4 Minimize new resource

The use of wood and brick materials is chosen because they can be recycled, thereby reducing carbon emissions. Additionally, these materials provide a healthier and more comfortable environment for occupants, enhancing the building's natural aesthetic value and contributing to its long-term value and appeal(8).



Figure 16. Wood Materials

3.5.5 Working with Climate

The use of green roofs, curved roofs, and overhangs on the west and east facades aims to optimize the building's performance in responding to local climatic conditions. Green roofs and curved roofs can be designed to enhance natural ventilation and reduce heat loads inside the building.

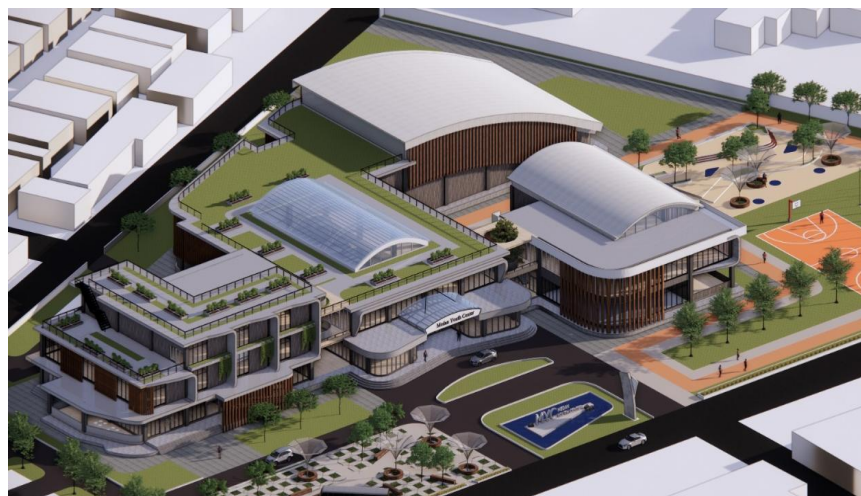


Figure 16. Exterior Building

4. Conclusion

The green architecture approach is highly suitable and effective when applied to educational buildings such as youth centers. Its implementation encompasses energy efficiency, optimized land management, the use of environmentally friendly materials, and a focus on user comfort. Green architecture creates a healthy environment with good air quality, natural lighting, and comfortable temperatures, all of which are crucial for enhancing the concentration and productivity of young people. Flexible designs and multifunctional spaces allow for various creative activities, such as art, music, and sports. The integration of natural elements like gardens and green open spaces inspires creativity and provides places for young people to explore. Thus, the application of green architecture in youth centers supports the growth, creativity, and well-being of young people while also contributing positively to environmental sustainability.

5. Acknowledgements

This research is a study of designing youth center in Medan City with green architecture approach, which aims to develop the interests and talents of youth as well as enhance their knowledge and skills in Medan. The author would like to thank the Department of Architecture, Faculty of Engineering, University of North Sumatra, and all parties who have assisted in this research and design.

References

- (1) Suntrock JW. *Adolescence*. 9th ed. New York: The McGraw -Hill; 2003.
- (2) BKKBN. *Kajian Profil Penduduk Remaja Usia (10-24 Tahun): Ada Apa dengan Remaja*. Jakarta: BKKBN; 2011.
- (3) Syawal AFT. *Perancangan Youth Center Dengan Pendekatan Arsitektur Biofilik*. 2022;
- (4) Badan Pusat Statistik. *Statistik Kriminal 2021* [Internet]. 2021. Available from: <https://www.bps.go.id/id/publication/2021/12/15/8d1bc84d2055e99feed39986/statistik-kriminal-2021.html>
- (5) Badan Pusat Statistik. *Jumlah Penduduk Kota Medan Menurut Kelompok Umur dan Jenis Kelamin (Jiwa), 2020-2022* [Internet]. 2022. Available from: <https://medankota.bps.go.id/indicator/12/102/1/jumlah-penduduk-kota-medan-menurut-kelompok-umur-dan-jenis-kelamin.html>
- (6) Fikri Mauludi A, Fitri Satwikasari A. *KAJIAN PRINSIP ARSITEKTUR HIJAU PADA BANGUNAN PERKANTORAN (STUDI KASUS UNITED TRACTOR HEAD OFFICE DAN MENARA BCA)* [Internet]. Vol. 17, *SINEKTIKA Jurnal Arsitektur*. 2020. Available from: <http://journals.ums.ac.id/index.php/sinektika>
- (7) Henriyanto A, Arsitektur MJ, Teknik F, Halu U, Aspin O. *PERENCANAAN PUSAT TEKNOLOGI INFORMASI DI KENDARI DENGAN PENDEKATAN ARSITEKTUR HIJAU*. Vol. 1.
- (8) Salaswari RU, Suroto W, Nirawati MA. *PENERAPAN PRINSIP ARSITEKTUR HIJAU Pada Pusat Pelatihan Olahraga Penyandang Disabilitas di Surakarta* [Internet]. Januari. 2020. Available from: <https://jurnal.ft.uns.ac.id/index.php/senthong/index>