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Designing Kids Club in The City of Medan with Sustainable Architecture Approach

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ABSTRACT

This study discusses the design of a Kids Club in Medan City using a sustainable architecture approach as a non-formal educational facility that supports the growth and development of elementary school aged children. The design is motivated by the limitations of the formal education system, which primarily emphasizes academic achievement and provides insufficient opportunities for children to play, explore, and develop sensory and motor skills. This issue is compounded by the lack of safe, inclusive, and affordable public facilities in Medan City, leading to increased passive activities and limited physical stimulation among children. The objective of this design is to provide a safe and supportive environment that facilitates children's exploration, sensory and motor stimulation, and participation in educational and enjoyable activities. The project also aims to promote environmental awareness from an early age through environmentally friendly design principles. The methodology includes site selection based on suitable Development Planning Areas (WPP), evaluation of alternative locations, field surveys, and data analysis using primary data from site observations and secondary data from relevant literature. The results indicate that the proposed Kids Club effectively accommodates exploration activities, structured play, non-formal education, and inclusive communal spaces for children and the surrounding community. The application of sustainable architecture is reflected in energy-efficient and environmentally responsive design strategies. This design is expected to address the shortage of educational play facilities in Medan City and provide social, environmental, and economic benefits for the local community.

Keywords: child-friendly design, kids club, non-formal education, public educational facilities, sustainable architecture.

ABSTRAK

Penelitian ini membahas perancangan Kids Club di Kota Medan dengan pendekatan arsitektur berkelanjutan sebagai fasilitas pendidikan nonformal yang mendukung tumbuh kembang anak usia sekolah dasar. Perancangan ini dilatarbelakangi oleh keterbatasan sistem pendidikan formal yang lebih menekankan pada pencapaian akademik dan belum memberikan ruang yang cukup bagi anak untuk bermain, bereksplorasi, serta mengembangkan kemampuan sensorik dan motorik. Permasalahan

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tersebut diperparah oleh minimnya fasilitas publik yang aman, inklusif, dan terjangkau di Kota Medan, sehingga menyebabkan meningkatnya aktivitas pasif dan terbatasnya stimulasi fisik pada anak.Tujuan perancangan ini adalah menyediakan lingkungan yang aman dan mendukung bagi anak untuk melakukan eksplorasi, memperoleh stimulasi sensorik dan motorik, serta berpartisipasi dalam kegiatan yang edukatif dan menyenangkan. Selain itu, proyek ini juga bertujuan untuk menanamkan kesadaran lingkungan sejak dini melalui penerapan prinsip-prinsip desain yang ramah lingkungan. Metode yang digunakan meliputi pemilihan lokasi berdasarkan Wilayah Pengembangan dan Pembangunan (WPP) yang sesuai, evaluasi beberapa alternatif lokasi, survei lapangan, serta analisis data yang berasal dari data primer berupa observasi lokasi dan data sekunder yang diperoleh dari berbagai literatur terkait. Hasil perancangan menunjukkan bahwa Kids Club yang diusulkan mampu mengakomodasi kegiatan eksplorasi, permainan terstruktur, pendidikan nonformal, serta menyediakan ruang komunal yang inklusif bagi anak-anak dan masyarakat sekitar. Penerapan arsitektur berkelanjutan diwujudkan melalui strategi desain yang hemat energi dan responsif terhadap lingkungan. Perancangan ini diharapkan dapat menjadi solusi atas keterbatasan fasilitas bermain edukatif di Kota Medan serta memberikan manfaat sosial, lingkungan, dan ekonomi bagi masyarakat setempat.
Kata Kunci: desain ramah anak, kids club, pendidikan nonformal, fasilitas pendidikan publik, arsitektur berkelanjutan.

1. INTRODUCTION

Education has long been regarded as a fundamental foundation for shaping human quality and civilization. Nelson Mandela stated that education is the most powerful weapon that can be used to change the world [1] because through education individuals not only acquire academic knowledge, but also life values, social skills, personal development, and readiness to face various life challenges. Therefore, education should ideally be conducted in a holistic manner and address all aspects of a child's development.

However, the reality of the current formal education system indicates that learning processes in schools generally remain focused solely on academic achievement, with teaching methods that tend to be rigid and provide minimal active student engagement. This learning model has experienced relatively little significant change over a long period of time. Dependence on a one-way educational system has the potential to limit children's opportunities to develop non-academic abilities, such as creativity, independence, social skills, and emotional sensitivity.

These conditions contradict various child development theories that emphasize play as an essential component of healthy learning and growth. Through play activities, children have opportunities to explore their environment, understand their roles, and naturally develop cognitive, social, and emotional abilities. In addition, children's physical development is closely related to intellectual growth, indicating that activities involving bodily movement should receive attention equal to that given to cognitive learning [2]. Thus, the assumption that play and learning are two opposing concepts is inaccurate.

Play activities provide opportunities for children to discover new possibilities, enhance creativity, and develop a more optimistic outlook on life [3]. Montessori further emphasized that children's level of happiness can be used as an indicator of the success of an educational procedure [3]. Children tend to be happier when they are given the freedom to explore and develop their physical, mental, and spiritual potential in a balanced manner [4].

The limited availability of exploration spaces within the formal education system cannot always be compensated for through activities outside school hours. In the city of Medan, not all children have the privilege of a safe environment, adequate public facilities, or sufficient supporting resources to play and explore optimally. While stimulation for infants and toddlers is relatively easier to provide, elementary school-aged children have more complex developmental needs and therefore require environments specifically designed to support independence and exploration. Another phenomenon that further intensifies this issue is the increasing dependence of children in urban areas on digital devices. Limited open spaces, a lack of child-friendly facilities, unhealthy environmental conditions, and safety concerns cause children in large cities such as Medan to engage more frequently in passive activities rather than physical ones. As a result, children's sensory and motor development is at risk of not developing optimally. In fact, the United Nations (UN) has recognized play as one of children's fundamental rights, as stated in Article 31 of the Convention on the Rights of the Child, which affirms that every child has the right to rest, play, and participate in recreational activities appropriate to their age [2].

Based on these issues, this study aims to design and examine the importance of play-based educational facilities that can support the physical, cognitive, and social development of elementary school-aged children in the city of Medan. This research is expected to produce a concept for an educational facility that functions not only as an alternative learning space, but also as a safe, inclusive environment that supports children's holistic growth and development.

Kids Club

Understanding the separate meanings of “kids” and “club” is helpful to understand the concept of a Kids Club. “Kids”, or in Indonesian translates to “anak-anak”, means “little humans” [5], and “club” or in Indonesian translates to “klub” means “a union whose activities are to gather under the same goal or mission”, or it can also mean “a building for a community’s get-together” [5]. Therefore, based on these explanations it can be understood that a Kids Club is a facility or building that hosts activities for children where they can socialize and interact with their peers.

Play

Play is generally divided into a few types, such as active play which encourages children to play using active physical movement [2] (see Figure 1), quiet play which invites children to do quiet activities such as playing with art material or toys (see Figure 2), adventure play which gives children the chance to build and create something creatively (see Figure 3), and nature play that engages children in the interaction with natural elements such as water, trees, animals, mounds, tunnels, sand, etc. (see Figure 4) [2].

Figure 1. Active Play

Figure 2. Quiet Play

Figure 3. Adventure Play

Figure 4. Nature play

Sustainable Architecture

Etymologically, “sustainable” can be understood as something that is related to the method of using a renewable resource so that this resource will never run out or be damaged [6]. “Sustainable” can also mean something that is continuous [5]. Therefore, sustainable architecture means the practice of architecture that considers the aspect of using energy and resources sustainably so that the design can continuously save on energy usage or even create its own source of energy to power the building, whether partially or completely. To put it simply, it’s the practice of architecture that designs a space that is healthy, comfortable, flexible in its usage, uses energy efficiently, and is designed to be used for a long time [7].

Sustainable architecture is a design approach oriented toward environmental awareness, in which the resulting design is able to respond to and address various issues related to the global environmental crisis [8]. The application of sustainable architecture principles is carried out through efficiency efforts in various aspects, including energy use, land utilization, material selection, the application of new technologies and materials, and waste management. In particular, efficient land use is one of the most important

implementations of sustainable architecture, as it involves the integration of nature, human behavior, regulations, and local culture [9].

Teori Montessori Learning Environment

The concept of "The Children's House" proposed by Maria Montessori represents an ideal learning environment that supports the balanced physical and mental development of children [10]. The main principles of its design emphasize a home-like atmosphere, a safe and well-connected relationship between indoor and outdoor spaces, and the use of furniture and facilities adapted to children's needs, sizes, and abilities. This environment is designed so that all elements are easily accessible, allowing children to move freely and explore independently. In addition, the use of bright colors, the presence of plants as natural elements, and spacious, uncluttered floor areas are essential components in supporting children's activities and freedom of learning.

2. METHODOLOGY

The research method applied in the design process of this Kids Club building is the descriptive method, which aims to collect in-depth factual information to describe existing phenomena, identify problems, and examine prevailing conditions and practices [11]. This method also allows for comparison and evaluation, as well as an understanding of how similar issues are addressed by others, so their experiences can be used as a basis for future planning and decision-making. In this study, surveys and case studies are conducted to gather data that support the information obtained from literature reviews. The collected data are then analyzed and synthesized into conclusions, which are subsequently applied as the design concepts for the Kids Club in Medan (see Figure 5).

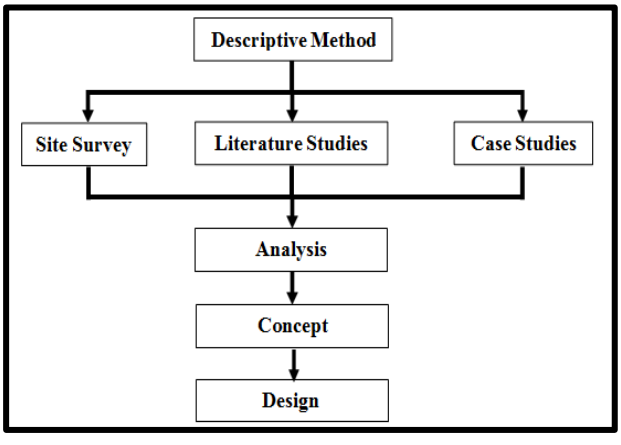

Figure 5. Thinking Process Framework

3. RESULTS AND ANALYSIS

3.1 Site Location

Location selection is influenced by several key factors, including ease of access, visibility, the availability of safe and comfortable parking areas, potential for future expansion, supportive environmental conditions, the presence of competitors, and compliance with government regulations [12]. The site is located in Medan Johor, one of Medan City's districts, and is situated right at the intersection of Jl. Eka Sama and Jl. Eka Budi, an asymmetrical patch of land by the river (see Figure 6). This site was chosen mainly because of its strategic location. Medan Johor is a district that is planned to be developed as an area for business, government, housings, city forest and education center. This means that the Kids Club facility will be surrounded by many housings, schools, and natural setting which makes it easily-accessible and the environment is green enough for children.

Figure 6. Site location on Eka Sama Street

3.2 Accessibility Concept

Accessibility refers to the degree of ease with which a place or facility can be reached; therefore, it is not only related to availability but also to how easily it can be accessed. In this study, accessibility is defined as physical accessibility associated with building and environmental infrastructure, including access to public buildings, road networks, public parks and cemeteries, as well as public transportation facilities [13].

The site, which is located on Eka Sama Street, is easily accessible to people from various parts of Medan City, particularly Medan Johor District, as Eka Sama Street is an urban road directly connected to a secondary collector road (Karya Jaya Street) on its western end and a primary arterial road (Brigjen Zein Hamid Street) on its eastern end. To accommodate this accessibility, multiple entrances are provided to serve various modes of transportation, including cars, motorbikes, bicycles, and pedestrians. A main in-and-out entrance is designated for vehicular access (see Figure 7), while pedestrian-friendly access is available along the western and northern boundaries of the site, allowing pedestrians to approach the site from nearly all directions (see Figure 8).

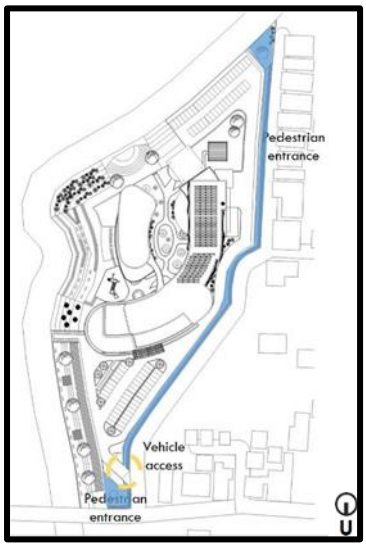

Figure 7. Accesses Available on Site

Figure 8. Access for vehicles

Figure 9. Access for Pedestrians

3.3 Main Concept

There are two key ideas that serve as the base of all the concepts developed for the rest of the design: “creating child-friendly space” and “the existence of a micro-ecosystem in a macro- ecosystem”, where this building is designed to fulfill its purpose to meet the children’s need of stimulating, comfortable safe space to explore while actively acts as a small part of the city that contributes to the city’s effort to save and nurture its natural environment and to build a greener city by promoting sustainability and eco-friendliness.

3.4 Main Children Facilities

These facilities are designed around the four basic types of play mentioned before while connecting them to nature or the outdoors as much as possible. There are different rooms for each play type that support the activities accordingly that also have access to the outdoors, and to accommodate children's varying levels of independence, there are also spaces for parents in each play type's area to ensure the psychological comfort of these children knowing that their guardians or caretakers are still around (see Figure 10). These children's rooms are divided into active play area (see Figure 11), quiet play area (see Figure 12), adventure play area (see Figure 13), nature play area (see Figure 14), and are complemented by educative area (see Figure 15) and communal area (see Figure 16).

Figure 10. Children's Area Surrounded by Guardian's Area and Nature

Figure 11. Active Play Area (sensory gym)

Figure 12. Quiet Play Area (block play)

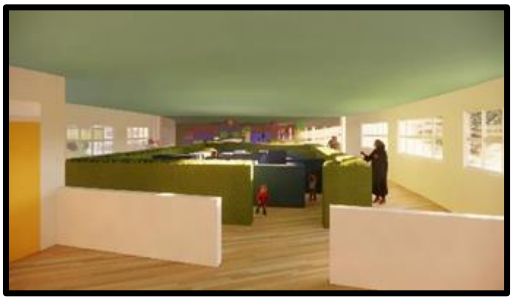

Figure 13. Adventure Play Area (labyrinth and giant blocks arena)

Figure 14. Nature Play Area (green house)

Figure 15. Educative Area (library)

Figure 16. Communal Area

3.5 Interior Design Concept

The interior design concept is a stage in the process of intellectual exploration that aims to understand and perceive an object objectively through the senses. This concept contains general characteristics that represent the character or identity of the designed

object [14]. Several aspects are considered in designing the interior of this building, such as room dimension, the use of colors, support for children's independence, and the incorporation of natural element. Small scales are generally applied in each room, sometimes in the volume of the room itself by playing with the ceiling heights or the floor elevations and sometimes in the choice of furniture such as putting some cubes to give children spaces to "hide" and be in their own space (see Figure 17). As for the use of colors, plain white color is chosen as the dominant color since it is believed that it can stimulate the child's imagination better as it works like a blank canvas. A few contrast and bright colors are also used but only in small amounts to attract children's attention (see Figure 18).

Figure 17. Small Cubes for Children to Play and Hide

Figure 18. The Use of Colors in The Interior

Figure 19. Steps to Help Children Reach The Window

Figure 20. Elements of Nature Inside

The interior design is also made to support children's independence so they can do many things on their own without having to rely on the adults' help. This can be seen in the scale of the furniture that is suited to the children's size and also in the incorporation of designs such as adding a step near the window to allow children to be able to reach it without help (see Figure 19). Nature is also present in every room since it is essential in a child-friendly environment [2]. The element of nature can be seen in the choice of wood flooring, the existence of indoor plants, and also the visual connectivity with the outdoor in every room (see Figure 20).

3.6 Landscape Design Concept

In designing the landscape and outdoor settings of the site, the idea to keep in mind is that nature for children is not just something to look at, but also to interact with [2]. This results in the incorporation of all four types of play on the site's landscape, and are visible in the form of recreational areas for children such as mini rock climbing wall, playground (see Figure 21), mounds (see Figure 22), waterfront and sensory river (see Figure 23), sand box (see Figure 24), vegetable and flower gardens (see Figure 25), and an amphitheater (see Figure 26).

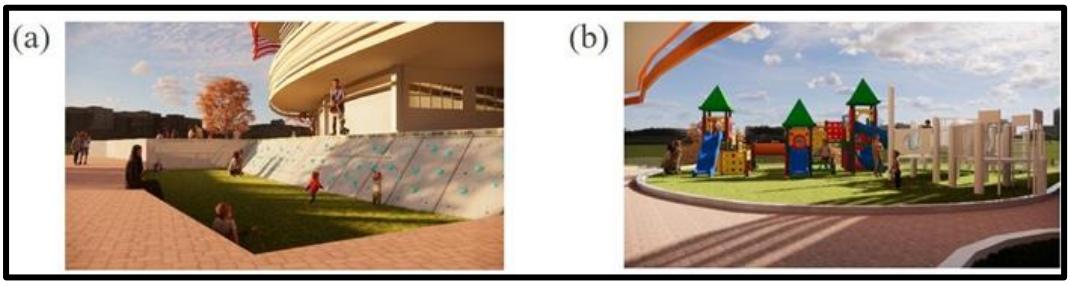

Figure 21. (a) Rock Climbing Wall , (b) Playground

Figure 22. Mounds

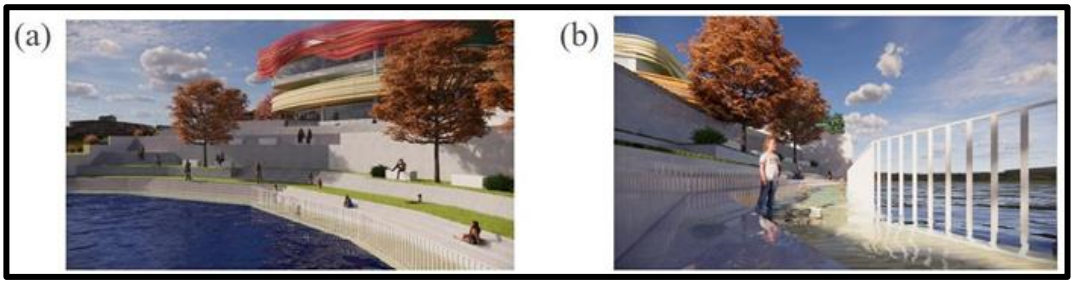

Figure 23. (a) Waterfront, (b) Sensory River

Figure 24. Sand Box

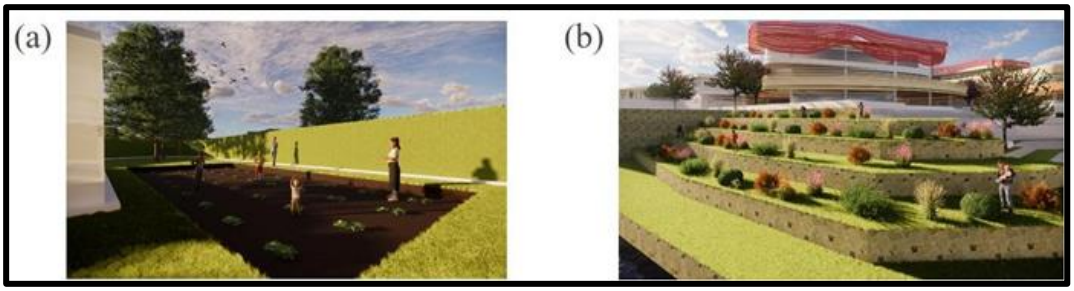

Figure 25. (a) Vegetable Garden, (b) Flower Garden

Figure 26. Amphitheater

The choice of plant types is also considered in designing the landscape. Variations of shapes, textures, colors and smells are important to stimulate children's sensory development and to enrich their experiences and perceptions of nature.

3.7 Mass Composition Concept

The basic concept of the mass composition is a simple initial mass that was shaped accordingly to fit the shape of the site, and then was processed to respond to the problems and potentials of the existing site to create a final shape that will serve the building's functions effectively (see Figure 27).

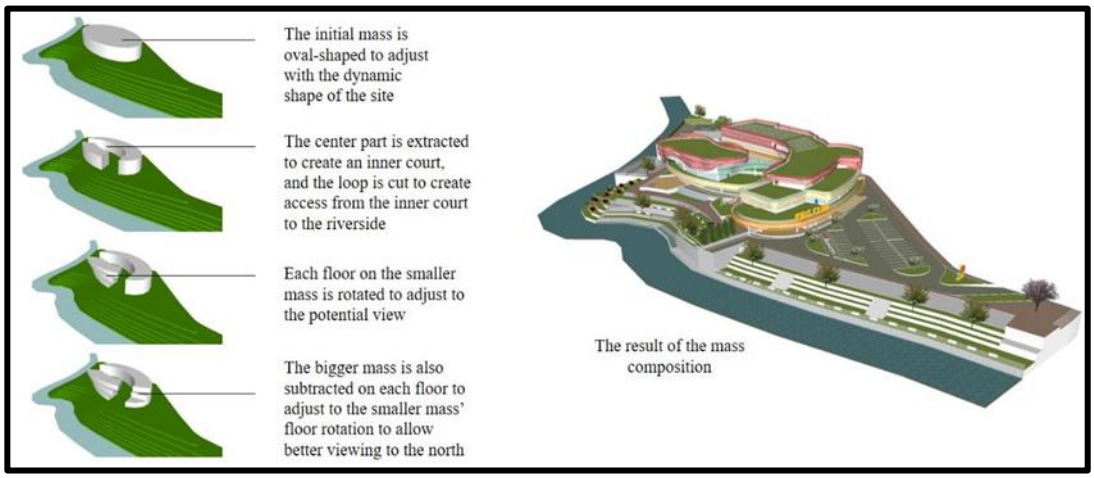

Figure 27. Mass Composition Process

3.8 Façade Concept

The façade is a crucial component of an architectural work because it is the first element seen and appreciated by the public and functions not only as an aesthetic feature but also as an identity marker that represents the character of the building [15]. Based on this understanding, the façade concept of the Kids Club is developed with the dual objectives of stimulating children's development and creating a greener environment. The building is enveloped with a secondary skin, particularly on the west side, to filter sunlight and reduce heat gain in accordance with environmental comfort standards. The secondary skin is designed in a wave-like form inspired by the river located on the east side of the site.

Constructed from metal as a more sustainable material and finished in contrasting bright colors, the façade conveys a playful character suitable for children. Additionally, vines and hanging plants are integrated into the secondary skin to further filter sunlight, improve air quality, reduce ambient temperature, and enhance the building's natural and green appearance (see Figure 28).

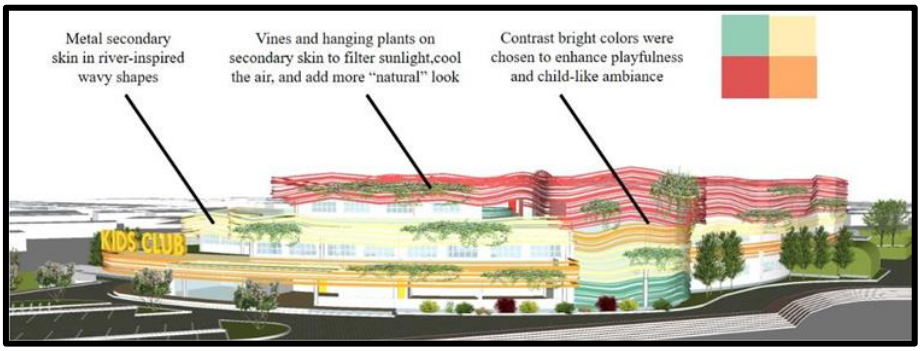

Figure 28. Building Façade

3.9 Implementation of Sustainable Architecture

Sustainable Architecture approach is used in the design to create a building that is greener and eco-friendly as a contribution to the city's environment. The key features are the green roofs that work as additional outdoor area in every floor for the children and also as additional surfaces to absorb rainwater that will be treated to be used again in the building (see Figure 29), and the use of solar panels to help power the building with electricity (see Figure 30).

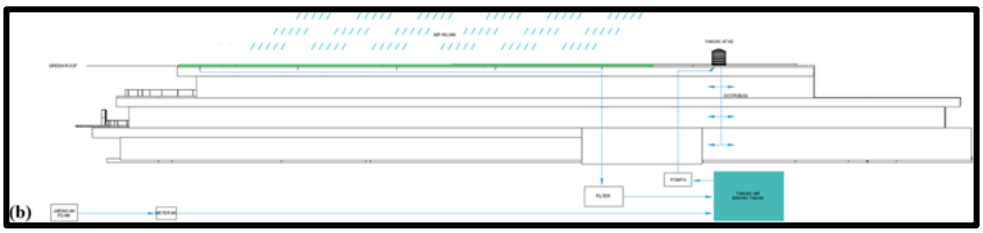

Figure 29. (a) Green Roofs, and (b) Rainwater Harvesting System

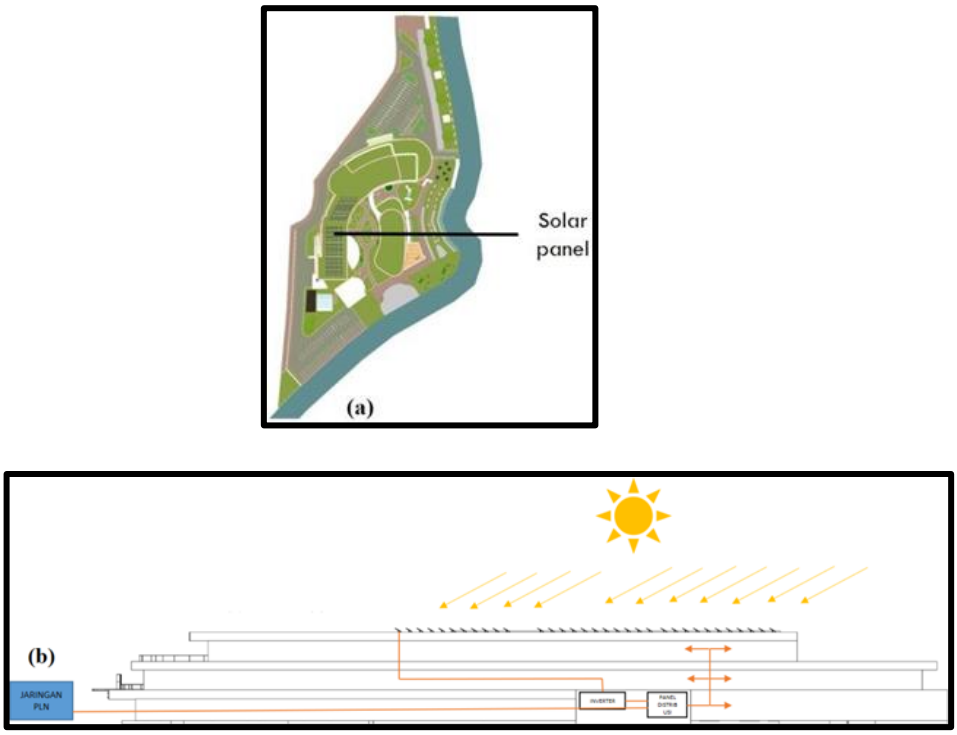

Figure 30. (a) Solar Panels, and (b) Solar Panel System

The other features are the use of steel as the dominant material for the building structure since steel is considered to be a sustainable material because of its durability for long-time usage and its reusability to be used multiple times, and also the application of passive design strategies to reduce energy use such as the maximization of natural light and the use of vegetation, secondary skin, and strategical building orientation to reduce heat from the sunlight, to lower the temperature inside and outside the building, and to allow fresher air to enter the building.

CONCLUSION

The Kids Club is designed for a specific user group which is the children, and therefore is designed according to their needs and specific behaviors. Along with this principle that dictates how the building will function, the approach of Sustainable Architecture is applied to the building design. The integration of both sustainable design principles and knowledge about children's behavior results in more richness to the children's experience in using this building and more values added to the building so that it functions more than just a building that serves the children's needs by being child-friendly but also serves the city by being sustainable and eco-friendly. With these outcomes, the existence of this sustainably-designed Kids Club building in Medan can result in the improvement of the city's quality in the long run

by increasing the well-being of its future generation and in the increase of nearby people's well-being immediately by contributing to adding more green space to the city.

DAFTAR PUSTAKA

[1] E. Baldwin, "I Grew Up Where Architecture Was Designed To Oppress, Archdaily." Accessed: Oct. 29, 2020. [Online]. Available: Https://Www.Archdaily.Com/947507/I-Grew-Up-Where-Architecture-Was-Designed-To- Oppress-Wandile-Mthiyane-On-Social-Impact-And-Learning-From-South-Africa,2020,

[2] Wilson, R., Nature And Young Children: Encouraging Creative Play And Learning In Natural Environments. Routledge, 2018.

[3] Schlichting, M., Understanding Kids, Play, And Interactive Design: How To Create Games Children Love. Crc Press., 2016.

[4] İslamoğlu, Ö., "Interaction Between Educational Approach And Space: The Case Of Montessori.," Eurasia J. Math. Sci. Technol. Educ., Vol. 14, No. 1, Pp. 265–274, 2017.

[5] E. Setiawan, "Arti Kata Klub, Kamus Besar Bahasa Indonesia (Kbbi) Online." Accessed: Jan. 11, 2022. [Online]. Available: Https://Kbbi.Web.Id/Klub, 2022

[6] Merriam-Webster, "Sustainable Definition & Meaning, Merriam-Webster." Accessed: Jan. 11, 2022. [Online]. Available: Https://Www.Merriam-Webster.Com/Dictionary/Sustainable

[7] D. Clements-Croome, Designing Buildings For People: Sustainable Liveable Architecture. The Crowood Press, 2020.

[8] Rakhmadani Agung Kurniawan And Luhur Sapto Pamungkas, "Penerapan Arsitektur Berkelanjutan (Sustainable Architecture) Pada Perancangan Taman Budaya Di Kabupaten Sleman," J. Arsit. Grid – J. Archit. Built Environ., Vol. 2, No. 1, Pp. 35–39, 2020.

[9] D. N. A. Mutiara And N. R. Syamsiyah, "Persepsi Masyarakat Terhadap Landmark Sebagai Citra Kota. Studi Kasus Tugu Makutha Surakarta.," Pros. Semin. Ilm. Arsit., Pp. 227–233, 2024.

[10] Paramita V.D., Hari-Hari Montessori Untuk Anak Usia Dini. Bentang. Pustaka, 2021.

[11] Sugiyono, Metode Penelitian Kuantitatif. Bandung: Alfabeta, 2020.

[12] F. Tjiptono, Service, Quality & Satisfaction. Yogyakarta: Andi, 2016.

[13] S. Panji, R. Pakudu, And U. Sako Baderan, "Aksesibilitas Pelayanan Sistem Informasi Manajemen Pada Dinas Perpustakaan Dan Kearsipan Kabupaten Gorontalo," J. Media Adm., Vol. 10, No. 1, Pp. 112–123, 2025.

[14] S. & H. Wardhana, "Perancangan Interior Ruang Lobby Dan Kamar Hotel Mercure Jakarta Sebagai Hotel Bisnis Dengan Gaya Modern Chinoiserie," Narada, Vol. 4, No. 1, Pp. 103–113.

[15] S. Sastra, "Kajian Estetika Bentuk Pada Fasade Perumahan Real Estate Di Yogyakarta," Inersia Lnformasi Dan Ekspose Has. Ris. Tek. Sipil Dan Arsit., Vol. 12, No. 1, Pp. 78–84, 2016.