Children's Library with Behavioural Architecture Approach in Medan City

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Abstract: These days, literacy-based child advancement is exceptionally vital and a quality program. During their development period, children and youths require excitement and an environment that can fulfill their physical and mental needs according to their age. The need for a perusing culture in Indonesia is caused by low levels of education in children and young people, causing human assets in Indonesia to be uncompetitive due to a need for science and innovation aptitudes. One quality that can be used to energize interest and make strides is proficiency in understanding current formative needs, not as it were through print collections but through very advanced collections. Perusing books from an early age creates a child's creative energy and positively affects their level of inventiveness, presently and in the future. In any case, there is no set to encourage it, so it is vital to construct a children's library in Medan City, which is anticipated to be a casual instruction center with the capacity to organize and encourage cognitive exercises and potential educational abilities, learning resources and play facilities with a climate that's able to specific instructive, inventive, communicative and engaging characters.

Keywords: Behavioral Architecture, Children's Library, Educational, Literacy, Recreative

Abstrak: Saat ini, pengembangan anak berbasis literasi menjadi sangat penting dan merupakan program yang berkualitas. Dalam masa perkembangannya, anak-anak dan remaja membutuhkan kegembiraan dan lingkungan yang dapat memenuhi kebutuhan fisik dan mental sesuai dengan usianya. Kebutuhan akan budaya gemar membaca di Indonesia disebabkan oleh rendahnya tingkat pendidikan pada anak dan remaja, sehingga menyebabkan aset manusia di Indonesia menjadi tidak kompetitif karena kebutuhan akan kemampuan ilmu pengetahuan dan inovasi. Salah satu kualitas yang dapat digunakan untuk membangkitkan minat dan membuat langkah maju adalah kemahiran dalam memahami kebutuhan formatif saat ini, bukan melalui koleksi cetak, tetapi melalui koleksi yang sangat canggih. Membaca buku sejak usia dini akan menciptakan energi kreatif anak dan secara positif mempengaruhi tingkat daya cipta mereka, saat ini dan di masa depan. Dalam hal apapun, tidak ada satu set pun yang mendorong hal tersebut, sehingga sangat penting untuk membangun sebuah perpustakaan anak di Kota Medan, yang diantisipasi untuk menjadi pusat instruksi kasual dengan kapasitas untuk mengatur dan mendorong latihan kognitif dan kemampuan pendidikan potensial, sumber daya pembelajaran dan fasilitas bermain dengan iklim yang mampu menjadi karakter instruktif, inventif, komunikatif, dan menarik.

Kata kunci: Arsitektur Perilaku, Literasi, Pendidikan, Perpustakaan Anak, Rekreatif

1. INTRODUCTION

The need for literation culture in Indonesia is caused by the low proficiency levels, which make the country's human assets less competitive due to the need for science and innovation aptitudes. In 2019, Indonesia's execution was positioned 68th out of 81 nations, concurring with the Program for International Student Assessment (PISA) conducted by the OECD or Organization for Economic Co-Operation and Development (OECD, 2023). Indonesia implies a drop of six places compared to its 2018 positioning of 62nd out of 70 nations. The general score was 369, with particular category scores of reading (359), math

(366), and science (383). Moreover, the appraisal uncovered that Indonesia had many understudies performing at level 5 within the levels 1 to 6 test categories (OECD, 2023).

Concurring to inquire about the conducted Education, Science, and Culture Organization of the United Nations in 2016 on 61 nations worldwide, perusing propensities in Indonesia are deficient. The ponder, distributed beneath "The World's Most Proficient Countries," indicates that Indonesia is positioned 60th. Based on the Alibaca Index calculation, the average number of the National Alibaca Record is within the low education movement category, which is at 37,32. The average percentage of the four dimensions of the Alibaca Index is 37.20%, with the percentage of the Proficiency Dimension at 45.2%, the Access Dimension at 13.7%, the Alternative Dimension at 24.1%, and the Cultural Dimension at 17%. Of the thirt four provinces in Indonesia (2019 data), 9 provinces (26%) in the medium category, 24 provinces (71%) in the low category, and 1 province (3%) in the deficient category. North Sumatra province alone has an Alibaca index of 35.73 and is in the low category (Puslitjakdikbud, 2019).

Medan City's population is 776,345, with 202,591 children aged 0-4 years, 195,350 children aged 5-9 years, 188,141 children aged 10-14 years, and 190,263 children aged 15-19 years (BPS, 2022). Data from the Medan City Library and Archives Office reveals that most library visitors are students, with 4,400 visitors, most teenagers aged 3-17 years (DPKA, 2020). The percentage comparison between the total number of children in Medan City and those who visit the library is 99.3%: 0.7%. Only two significant libraries in Medan City have children's library rooms. These libraries are part of the public library system and are managed by the Medan City Government (Pemko Medan) and the North Sumatra Provincial Government children's (Pemprovsu). The library space in public libraries is limited and needs to be accommodated for children's activities due to limited space and a restricted number of books. Reading is crucial in education and daily life, and the ability to read is necessary for obtaining various kinds of information. Just like adults, children also need information about the world and their surroundings, and technology development should be integrated into library design by combining print and digital collections according to age-based needs.

2. LITERATURE REVIEW

Children's Library

A children's library is a purpose-built facility providing many books and information resources. Space requirements should be considered to meet the needs of children, ensuring their safety and comfort. A children's library is a place where children can relax with interesting activities such as watching educational movies and teaching and learning activities aimed at developing personality, knowledge, creativity, research, and reading books. Types of Services in a Children's Library: Provision of reading materials, child reference service, reading guidance, film showing, storytelling events, and recreational game (Pribadi, 2024).

Child Overview

The age of children can be inferred if they are in the age range of 3-17 years.

Tabel 1. Child Characteristic (Pribadi, 2024)

No	Golden Age	Primary School Age	Junior High School Age	High School Age
1	Curiosity arises	Begin to think they can accomplish things and compare with their friends, resulting in positive competition with their peers.	Can already solve problems and think to find ideas	Can already distinguish between right and wrong
2	Very active	Love to play	Can get to know organizational socialization in the environment	Starting to find yourself
3	Ask more questions and imitate surrounding activities	Has a high level of interest	Already thinking causatively (visionary thinking)	Ability to reason
4	When children are given the opportunity to try many things, they will develop a sense of initiative.	Love to play	Negative phase because it has negative traits such as pessimism, lack of enthusiasm, lack of calm, etc.	Thinking of doing things efficiently
5	High level of selfishness	High level of liking for art	Often called the preteen or early adolescent phase	Start to introspect

Tabel 2. Activities Based on Activity Group Division (Pribadi, 2024)

No	Activity Group	Activities	Facilities
1	Main	Register, register receptionist storytelling, coloring, drawing, play, reading picture books, watching movies, leave items in the locker, dancing, singing, borrowing books, and eat	Children's Room (5-10 Years Old)
2	Main	Watching movies, leave items in the locker, dancing, singing, borrowing books, reading a book, discuss, participate in events, eat, seeking information using the internet, returning books, and learn	Special Room (11 13 Years)
3	Main	Watching movies, leave items in the locker, dancing, activities, singing, borrowing books, playing musical instruments, reading a book, discuss, participate in events, eat, seeking information using the internet, returning books	Special Room (14 18 Years)
4	Event	Learn, workshop, and exhibition	Age-Free
5	Support and Communal	Activities in the multipurpose room, worship, eat and drink	Age-Free
6	Manager's Room	Get creative, caring for and managing books, leaders work, secretary work	Manager's Room, Leader's Room, Secretary's Room, Staff Room
7	Parking	Car, motorcycle and bus parking	Area Parking
8	Garden	Socialize, reading, gardening, and playing	Indoor And Outdoor

Educational and Recreational Overview

Education has the meaning of having the nature of educating. Include for Information provision, skill development, Children to be independent, Trait formation, principles within oneself, Children have good morals, Guiding towards maturity, and Responsible child (AJHURI, n.d.). Recreation comes from the word recreation, refreshes the body and mind; something that is uplifting and refreshing, such as recreation/picnic. Recreational Criteria: Fun, Free, Informal, Dynamic (Faisyah, 2019).

Tabel 3. Education Criteria Must Consider Four Important Factors (Ayubi Syam et al., 2019)

No	Criteria	Explanation
1	Extensive learning opportunities	implemented in form, element, style, etc.
2	flexible	circulation that can facilitate user access to the desired room
		the shape of the room that can change depending on the activities that take place
3	variation	scale of building interiors that can provide a different atmosphere/ atmosphere in an activity
4	Clarity of orientation inside and outside the building	Direction, i.e. children's limitations regarding direction, except directions that indicate location

Behavioral Architecture

Behavioral architecture principles and themes: interact with people and the environment, facilities that make residents feel comfortable and happy, material utilization for furniture complementing beauty, order, and form of beauty, observe the situation and user behavior, natural lighting arrangement is positioned, applying color options, lighting arrangement, affects the senses, construction materials used that are capable of reducing disturbance, focus on body temperature comfort, and understand the interconnectedness of spaces based on the level of complexity of ongoing activities. Key concepts in behavioral architecture according to Haryadi and Setiawan in the book Architecture Environment, & Behavior: behaviour setting, territory, personal space & crowding, environmental pressure, stress, and coping strategy (Permata Nurkamalina et al., 2018).

Tabel 4. Application of Behavioral Architecture Approach to Space (Pribadi, 2024)

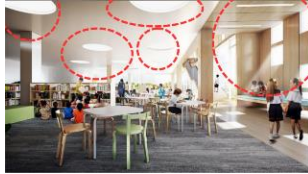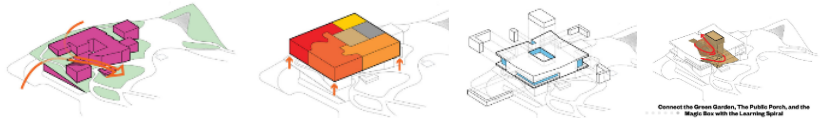| No	Variables	Influence on Users
1	Room Color	The effect of color on space users will vary according to the character and use of space
2	Size and Shape	A size that is too big or too small will affect the user's psychology.
3	Arrangement Furniture	The arrangement of furniture also has an important role in building the atmosphere of the room, the narrow distance of furniture or a messy arrangement of furniture can affect the user's psyche.
4	Sound, Temperature, and Lighting	A sound that is too loud will disrupt an individual's focus, while a quiet sound will improve individual focus. Temperature is related to the comfort of space users. Spaces with minimal air will affect with one's level of fatigue. Spaces that are too hot or cold also affect a person's comfort. Lighting affects a person's psychology, lighting is designed according to the function of the space. Too much or too little lighting can also affect a person's comfort.

Case Study

Tabel 5. Comperative Study of Similar Function (Pribadi, 2024)

		Shanghai Children's Library	Raheen Library at Australia Catholic University / Woods Bagot	Grahatama Pustaka	Children's Library at Concourse House	Cultural Architecture (CALS) Children's Library	Public Air Library
Building	Parking Area	Available	Available	Available	Available	Available	Available
	Public Facility	Available	Available	Available	Available	Available	Available
	Special Facility	Available	Available	Available	Available	Available	Available
	Collect Area	Available	Available	Available	Available	Available	Available
	Reading Area	Available	Available	Available	Available	Available	Available
	Management Area	Available	Available	Available	Available	Available	Available
Library Room	Collection Storage Room	Available	Available	Available	Available	Available	Available
	Information Access	Available	Available	Available	Available	Available	Available
	Library Service Facility	Available	Available	Available	Available	Available	Available
Library Facility	Work Furniture	Available	Available	Available	Available	Available	Available
	Storage Furniture	Available	Available	Available	Available	Available	Available
	Multimedia Equipment	Available	Available	Available	Not Available	Available	Available

Tabel 6. Comperative Study of Similar Themes (Pribadi, 2024)

No	Comparative Study	Principles Of Behavioral Architecture	
		A Place To Interact With People And The Environment	Facilities That Make You Feel Comfortable And Happy
1	Shanghai Children's Library	Interaction space between reading and community space around Shanghai Children's Library.	The creativity and exhibition space is the program's collaborative space with a rooftop area overlooking the park. Designed for a collaborative and collective learning environment, these spaces support a wide range of activities, from creative spaces, game-based active learning, to literary and cultural exchange and discussion spaces, public exhibitions and auditorium use.
2	Grahatama Pustaka	Facilities for discussion	There is a 6 D movie facility and a children's reading room, which makes the Children are free to choose books and read them anywhere.

No	Comparati-ve Study	Principles Of Behavioral Architecture	
		Utilization of Materials for Furniture	Implementing Bright Colors
1	Shanghai Children's Library	A staircase that can be used as a child's reading area	The colors applied are as follows
2	Grahatama Pustaka	Utilization of music space and introduction to nature as well	The colors applied are as follows

No	Comparati-ve Study	Principles Of Behavioral Architecture	
		Natural Lighting	Affects the Sensory System
1	Shanghai Children's Library	Open reading room with natural lighting.	Using glass openings that can directly provide coolness from the view of the community garden around the library and the interior colors in the building support children to be more enthusiastic.
2	Grahatama Pustaka	There are no buildings that use natural light, (only use lights)	Provides a sense of sight with the coolness of the garden in the middle of the reading room

No	Comparati-ve Study	Principles Of Behavioral Architecture
		Space Based on User Behavior
1	Shanghai Children's Library	Connecting the indoor space with the surrounding garden, so that children can enjoy the outside landscape and surroundings (can see directly through the openings in the building). Connecting the room with a spiral staircase that can be used for reading. And the main design of the upper block is designed in the form of a large wooden puzzle with an open space in the center area.
2	Grahatama Pustaka	There is a reading room that can directly see the garden in the center of the building with us free to sit and discuss in the center of the building, and Separate children's playroom. And a reading room where children are free to sit anywhere

3. **METHODS**

The methodology for designing a children's library with behavioral architecture approach in medan city uses data collected through primary and secondary data. Primary data is obtained directly from the source (observation and interviews), and secondary data is obtained indirectly from sources or library materials (library study). In addition to using descriptive analysis methods, qualitative analysis is accompanied by literature studies that support the theory.

Interviews are conducted with questions

1. What are the desired space requirements for a children's library?
2. Is it important to have a children's library and why?
3. What are the main reasons a children's library is essential?
4. What is the condition of students' talent interest before and after the school literacy movement program?
5. What books are students interested in?
6. What efforts does the school make to increase students' interest in reading through this school literacy movement?
7. What are the supporting and inhibiting factors for school literacy activities?
8. Is the school library equipped with a digital collection?
9. What are the criteria for selecting library materials?
10. What steps are taken before the morning reading activity?

4. **RESULT AND DISCUSSION**

Location

The project with the title Designing Children's Library with Behavioral Architecture Approach in Medan City, is to provide a place for literacy activities for children and adolescents in Medan City. The location of this project is located in Medan Hevetia, North Sumatra, precisely on Jalan T. Amir Hamzah, Helvetia Tim., Kec. Medan Helvetia, Medan City, North Sumatra 20124.

The location of the area is bordered by

1. North side   : Deli Serdang Regency   3. West Side :   Deli   Serdang
                                                              Regency

2. South Side   : Medan Sunggal Sub-district   4. East side   : West Medan Sub-
                                                              district

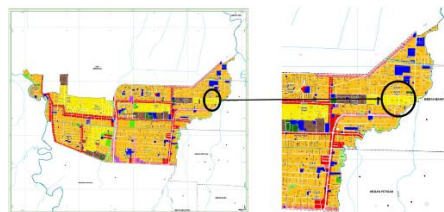**Figure 1**   Site Location (Perda Kota Medan Nomor 1 Tahun 2022, n.d.)

A. Regulation

Based on measurements through Google Earth, the site size will be designed as an area of ± 13,000 m2 or equivalent to ± 1.3 Ha. The site is in an urban area, so the site has no contours. In addition to the site area, the building area is also considered by the Medan City Spatial and Regional Plan (RTRW) 2015-2035 regulations. The following is a description of the building area limitations by the regulations.

Tabel 7. Limitation of Building Area based on Medan City Spatial and Regional Plan Regulation (Perda Kota Medan Nomor 1 Tahun 2022, n.d.)

No	DESCRIPTION	DETAILS
1	Project Case	Children's Library
2	Project Status	Fictitious
3	Project Owner	Private
4	Land Area	± 1.3 Ha
5	Contours	Relatively Flat
6	KDB	70%
7	Outbreak	2.1
8	GSB	10 m
9	Road Width	14 m
10	Max height	3 Floors / 14 m
11	KDH	Minimum 15%

B. Context and Connectivity

Figure 2. Figure Helvetia Field Zone (Perda Kota Medan Nomor 1 Tahun 2022, n.d.)

According to the Detailed Spatial Plan (RDTR) and Zoning Regulations of Medan City 2015-2035, the site is in the R2 (Medium Density Residential area.)

Tabel 8. Space Utilization Intensity (Perda Kota Medan Nomor 1 Tahun 2022, n.d.)

No	Zona	Max KDB	Max KLB	Min KDH	Max Building Height	DESCRIPTION
1	Medium Density Housing	70%	2,1	15%	3 Floors/ 14 M	Subject to feasibility of building requirements. For City Centers and SPKs in the RTRW, a maximum KLB of 21 applies as long as the building requirements are feasible.

Tabel 9	Road Function Plan (Perda Kota Medan Nomor 1 Tahun 2022, n.d.)		
No	Road	Road Width	GSB	Trase/Road
1	Jl Karya	14	10	Jl. T. Amir Hamzah - City Limits

Design Analysis

A. Site Access, Parking and Circulation Analysis

The site can be accessed from the main street (T. Amir Hamzah) and no access points exist in the North, East, and West.
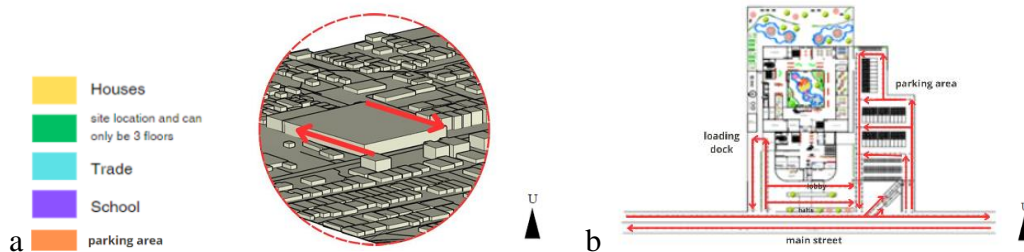
Figure 3   a. Analysis of Site; b. Parking and Circulation Plan (Pribadi, 2024)

B. Noise Analysis

On the south side, there are several houses, so the noise level is relatively moderate; on the east side, there are boarding houses and stalls with a relatively moderate noise level. However, the west and south sides of the site are shallow due to vacant land. As seen from the picture below, the sun's orientation is from east to west of the site. Solar heat occurs from 12:00 to 16:00 p.m., and the heat is more intense on the south side of the site. Because the site is empty land with only some vegetation, the entire site area is exposed to the sun's heat.

a. b. c.
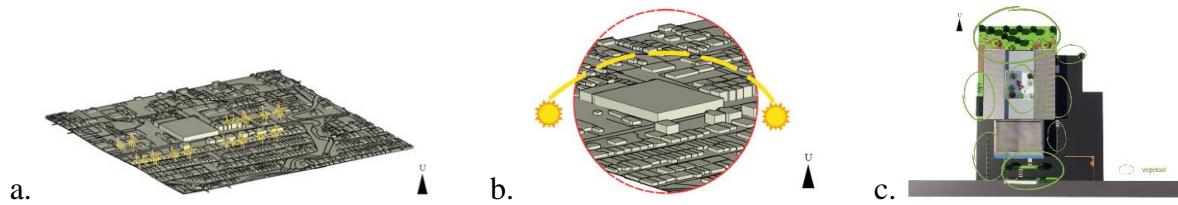
Figure 4 a. Noise Analysis; b. Sun Analysis; c. Vegetation Plan (Pribadi, 2024)

C. Child visitors with division;

- Category i : age group 6-12 years (a room must be provided that is more spacious and flexible so that children can learn while playing without obstacles).

- Category ii : age group 12-17 years (a room that is not too rigid will be provided to fulfil discussion activities and using internet).

- Category iii : parents/chaperones, managers, and guests. (Assistance activities in children's libraries aim to help library users access and use information resources more effectively. An exhibition is designed to capture children's interest and encourage learning through various interactive and educational activities. Literacy activities are a series of activities that aim to improve understanding, skills, and habits in reading, writing, speaking, and listening. As a children's library manager, you have an essential role in ensuring children can access and use the library effectively. Guest objectives include guests who want to support children's education, encourage literacy, support the development of a reading culture, reduce educational disparities, ensure equitable access and create long-term impact.)

Area Program

Tabel 10. Total Area Design (Pribadi, 2024)

| Room	WIDE
Recipient activity facilities	518
Children and youth library	3560
Educational Facilities and Events	906
Support and communal facilities	1301
Management Area	124.8
Service	444.925
Parking	1380
RH	1365
Total	9599

Design Result

A. Massing

The front part is the lobby and registration, the back is the library, and the middle will be made into a garden. They are made into one direction of circulation so that children do not get lost easily.
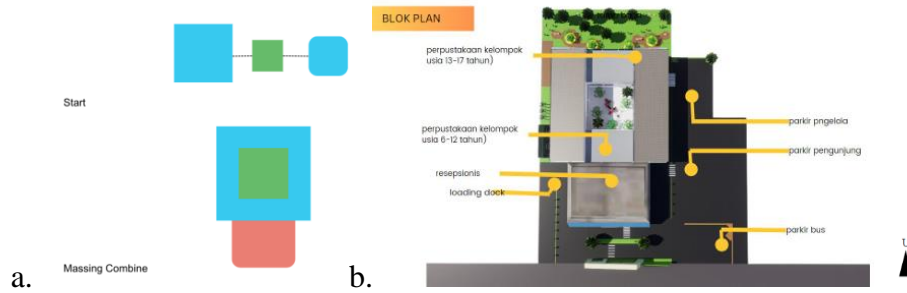
Figure 5 a. Massing Combine; b. Blok Plan (Pribadi, 2024)

B. Zoning

The response to optimize the heat from the sun into the building is: the outermost public is the park, parking lot on the east side, the library is located on the west side of the site, the lobby is located in the centre of the site, the building will be made elongated, the building is only three floors.
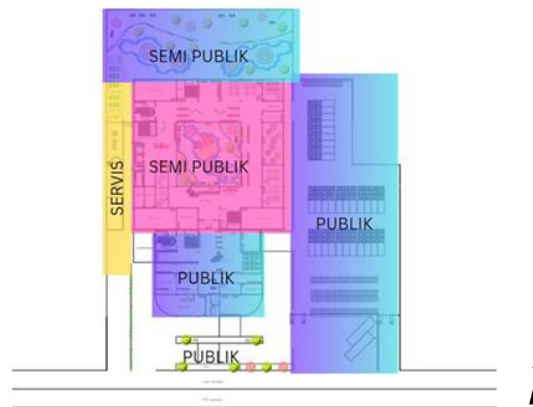
Figure 6 Zoning (Pribadi, 2024)

C. Context

Circulation directors are made one-way with differentiated entrances and exits, to facilitate information on the parking area and to the lobby.

D. Theme Implementation

Tabel 11. Implementation Theme (Pribadi, 2024)

| No	Characteristics	Implementation
1	Designs have various forms	Arrange the blocks regularly with different color variations to give a fun and imaginative impression
2	The design has a variety of colors	The colors that will be planned are bright colors such as: red, yellow, white, green, blue, pink rose, brown, and black
3	Design with clear spatial orientation	The circulation orientation is clearly made from the main lobby, then you can choose 3 routes, the left route is for the children's group library room, the back left is for the youth group, the right side is the event room.
4	Have space where you can move freely	The concept of the design is that from various places you can go to various rooms.

E. Site Plan

The building is in the center of the site, and the perimeter of the site is vegetated, minimizing noise.
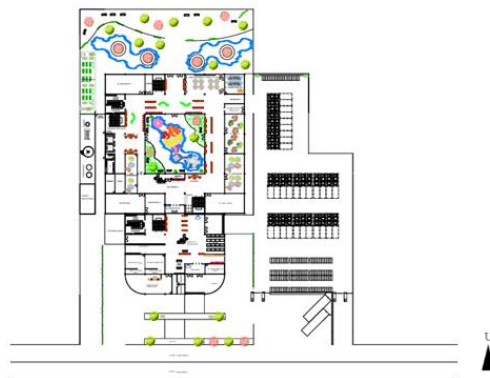
**Figure 7**. Site Plan (Pribadi, 2024)

F. Design View

The building design does not predominantly use squares on the facade. Several shapes, such as the right and left front facades, combine to create a rectangular shape with a circular interior.

a b

c d
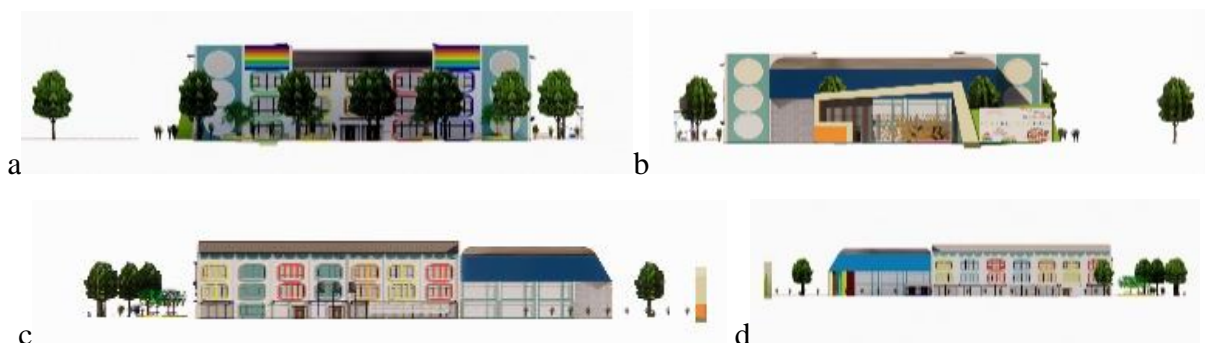
Figure 8. a. Behind View; b. Front View; c. Left View; d. Right View (Pribadi, 2024)

G. Floor Plan

The ages age group is 6-12 on the 1st floor and 13-17 on the 2nd floor (which requires quieter). The management area is on the 3rd floor, and the service area is on the left side of the building.

a.   b.   c.
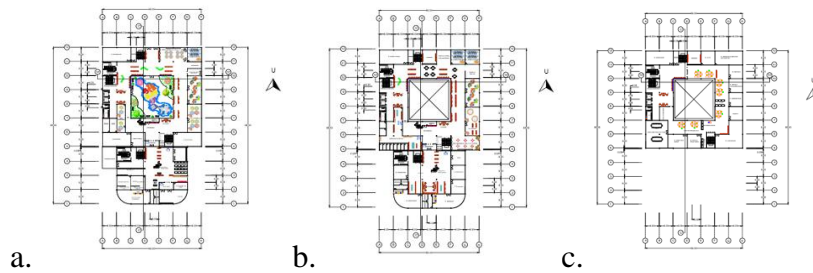
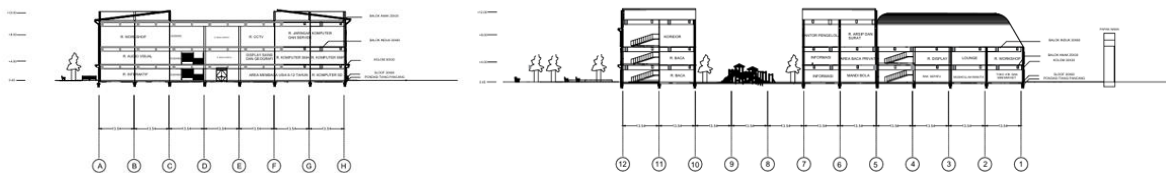**Figure 9**. a. First Floor; b. Second Floor; c. Third Floor (Pribadi, 2024)

H. Elevation

In the design of the children's library, one visitor lift, one goods lift, two emergency stairs (in the reception room building and the library room building up to the 3rd floor), and ordinary stairs in the library room up to the 3rd floor.
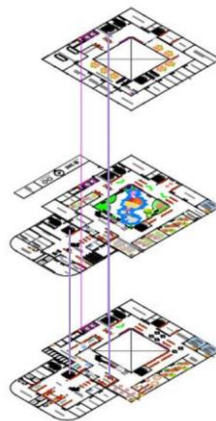
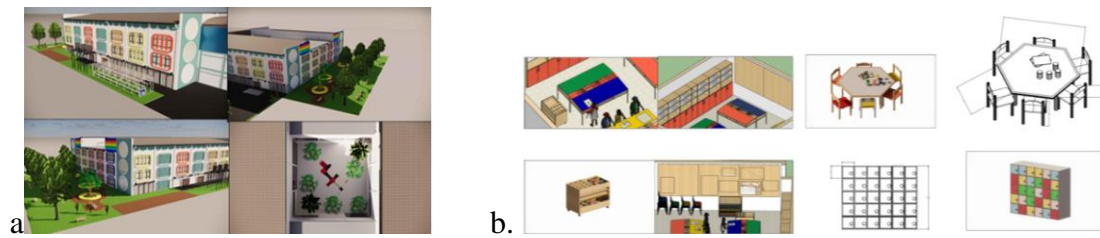**Figure 10**. Elevation Plan (Pribadi, 2024)

I. Section

Figure 11   Section Plan (Pribadi, 2024)

J. Architectural Drawing

The selected interior and outdoor facades have a variety of colors, as well as various shapes (octagonal, round, oval, and others).
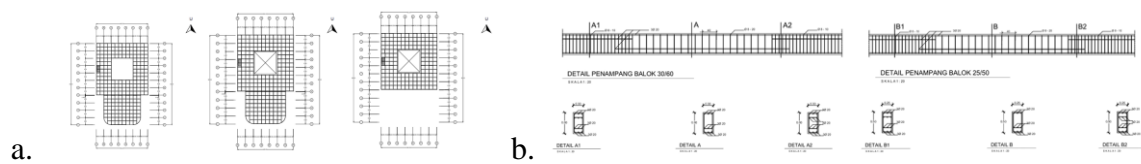
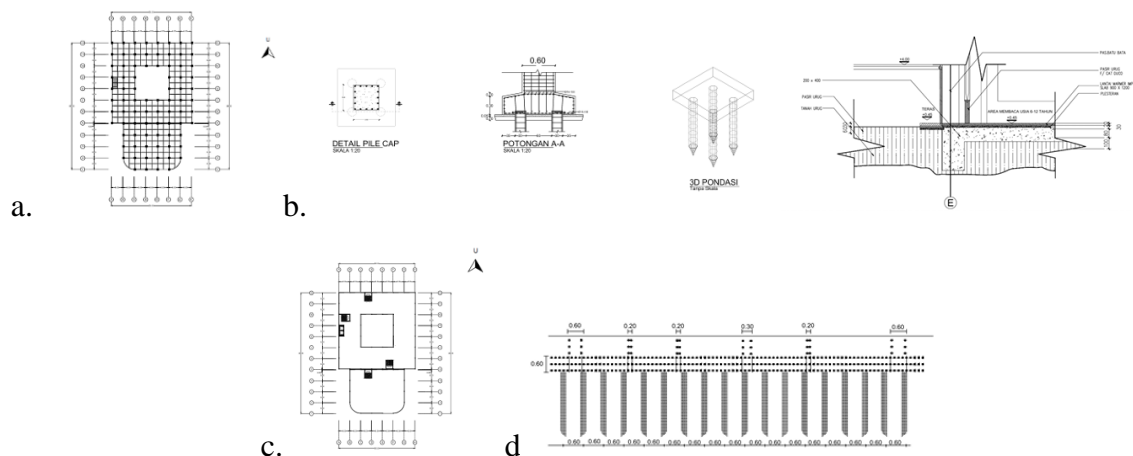**Figure 12**. a. Outdoor; b. Interior (Pribadi, 2024)

K. Structural Drawing

The planned structure uses:

Floor plate thickness 15 cm, column size 40x40, beam size 30x60, beam size 30x60, and uses a pile foundation.

Figure 13. a. Bloking First Until Third Floor Plan; b. Bloking Detail (Pribadi, 2024)

Figure 14 a. Pondation Plan; b. Detail Pondation, Dilatation Detail; c. Core Plan; Detail Core Pondation (Pribadi, 2024)

5. CONCLUSION

Designing a children's library with a behavioral architecture approach in Medan City is a solid basis for Medan's need for a place that contains literacy resources and learning and playing facilities. Children can do various activities, such as reading interesting collections, drawing, playing with educational toys, writing, making handicrafts, wall magazines, singing, drawing/painting, dancing, and others.

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