



SMART PARK DESIGN AS A SUPPORTING FACILITY FOR CHILD GROWTH

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ARTICLE INFO	ABSTRACT
<p><i>Article history:</i> Received Received in revised form Accepted Available online</p> <hr/> <p><i>Keywords:</i> Design, Smart, Children, Social, Mental Development</p>	<p>The goal of Smart Park Design is to provide a place for children to develop their talents / artistic creation; learning technology, gain skills, read knowledge books, and recreation areas. The method used is the "Descriptive Analysis" method, namely by providing a description and explanation of the data obtained both primary data and secondary data, then analyzed to obtain a conclusion that is using as a reference/basis for formulating the basic program for the development of the Smart Park in the sports center area of North Lombok Regency. The Smart Park design is divided into 4th zones: parking zones, transition zones, building zones and facilities, and green open cast zones. The conclusion is that the design of the Smart Park will help children's mental and social development well and will make children healthier and happier. And in the end, children as the successor of the nation will become a reliable driver to develop towards a developed and prosperous Indonesia.</p>  2020

1. INTRODUCTION

The open garden area is one aspect where there are many equal facilities available. Various types of facility users are founding in the area, from early childhood to senior citizens. One example of an open park is the Child-Friendly Integrated Public Space (CFIPS), which is currently being developing. The CFIPS develops in a residential area, where the benefits can be felt directly by the residents. It also serves to fulfill the rights of children to be able to live, grow, develop, and achieve optimally.

Smart Park is a place to get education/knowledge, talent/art/skills development, library, information technology introduction, and as a playground, recreation area, a place to introduce and adapt to the environment. The idea of a smart park by the North Lombok Regency Bappeda in

coordination with the Office of Education, Culture, Youth and Sports is an effort to fulfill the facilities for creative and recreational activities that are child-friendly. There are many benefits when inviting children to play and seek insight in the Park, especially in parks that have a variety of adequate facilities, such as: can improve mental and social development and make children healthier and happier.

2. LITERATURE REVIEW

The development of the nation's character is not only determined through formal education but also requires other facilities that support human physical and psychological development. Public facilities that can accommodate these developments include public spaces in the form of Green Open Space (GOS). GOS as a public facility will affect the quality of life, physical and psychological well-being of the community (Abbasi et al., 2016). One of the benefits of parks as green open spaces is to improve physical and psychological health (Sarhan et al., 2016).

In North Lombok District, the presence of GOS will be relevant to the commitment of the stakeholders to make North Lombok a Child-Friendly Regency. This is in line with global issues, namely the need to initiate the concept of Child-Friendly Cities (CFC). 10% of children in the world live in developed regions while 90% live in underdeveloped parts (Chan et al., 2016), so the CFC movement is expected to reduce this gap. The North Lombok Regency Government has plans to build facilities that support efforts to succeed in the CFC program. The Convention on Children Rights and CFC Frameworks should not only occur through a single project but equally require comprehensive institutional and behavioral reform (Chan et al., 2016).

The combination of green space and CFC concepts realized through the development of a Child-Friendly Integrated Public Space (CFIPS). CFIPS is an alternative facility that is developing in residential areas whose benefits can be received directly by residents. The fulfillment of social functions and the psychological needs of citizens with urban resources is the key to sustainable cities (Chiesura, 2004). CFIPS in North Lombok will build with the concept of a Smart Park. Carrying the theme of smart, Taman Pintar has challenges in the form of physical design, zoning, circulation, to the facilities that are in it.

A successful city park will have a positive impact on visitors (Razak et al., 2016), in addition to providing the city with a balance of space and creating a buffer zone between various city functions (Turan et al., 2016). Therefore, the design of the Smart Park is equipped with various facilities and buildings that accommodate all ages. Even though children are the main focus, smart Park must be able to reach young people and adults. Youth participation benefits the community by raising awareness of problems, overcoming adolescent problems, and increasing livability for all (Frank, 2006). Open spaces must be flexible and able to serve a variety of activities and be attractive to all groups of visitors and residents (Heng and Chan, 2000).

The utilization of open spaces of cities in the world is significantly different because of local contexts, such as local culture, social values, and climate (Karuppanan and Sivam in Xue et al., 2017). The design of the Taman Pintar area will adopt local wisdom values in North Lombok. From the aspect of architecture, buildings and area details will also apply the existing traditional architectural concepts. Another thing that is very important in designing smart Park is the concept of education. An approach to early childhood education is built on the perspective of goal

orientation related to children's play-learning, challenging educators to produce children and objects of learning simultaneously (Samuelsson and Carlsson, 2008). Parents and guardians of children who will visit this facility must also be involved in activities at the Smart Park. Adult participation in children's play is an important part of learning activities because adult intervention can advance children's performance levels (Hakkarainen et al., 2013). For this reason, it is necessary to prepare regional supporting facilities to assist the process of playing while learning, which will be part of the attractions and experiences experienced by visitors.

3. METHOD

In the design of the North Lombok Smart Park area, the methodology used is based on community aspirations. This can be done by holding several FGDs involving the relevant service offices in North Lombok Regency. Proposals and ideas from related agencies will be very useful for the design process starting from the concept, analysis, until the design transformation, which will eventually lead to the North Lombok Smart Garden Design. The framework for designing the North Lombok Smart Park can be seen in the following Figure 1:

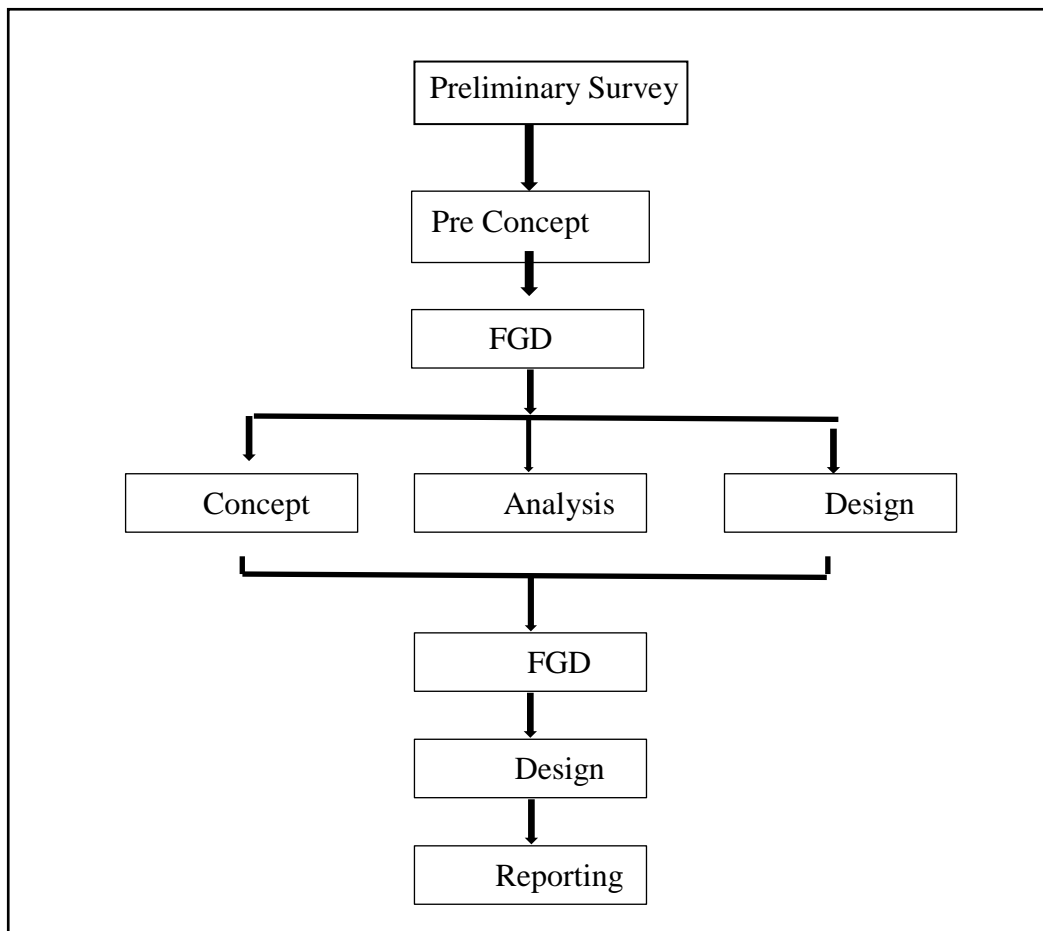


Figure 1. Framework for Intelligent Garden Design

4. RESULT AND DISCUSSION

4.1 GRAND CONCEPT SMART PARK

The grand concept of Smart Park is exploring to educate children and provide the rights of children who have been protected by the State. This spirit is in line with the fulfillment of children's rights as stated in the 1945 Constitution, Article 28 B paragraph 2: "Every child has the right to survival, growth, and development and is entitled to protection from violence and discrimination." The mandate of the Constitution is reinforced by Law Number 23 of 2002 article 4 concerning Protection of Children: "Children have the right to be able to live to grow, develop, and participate appropriately according to human dignity and dignity, and to get protection from violence and discrimination."

Smart Park is one of the facilities that can spur the application of constitutional mandates as outlined above. Many benefits can be obtained from developing parks as children's facilities. Some of the benefits are:

1. Enhancing Mental and Social Development

Open space, fresh air, and physical activity are important elements for children's brain development. All elements can be obtained by playing in the Park

2. Overcoming Stress. Children can experience stress or stress. One way to help him deal with stress is to get him to play in an open space like in a park.

3. Make Children Happier

As a facility dedicated to children, the next concept that must be embedded includes the development of an environmentally friendly Smart Park area and applying technology by the spirit of industry 4.0 launched by the Government.

The location of the Smart Park area development location is also an aspect that must be considered in the concept of development. In 2018 North Lombok Regency experienced a very severe earthquake. As a result of the earthquake, many public facilities and social facilities were heavily damaged and even destroyed. Therefore, the earthquake resistance factor is also one of the main concepts of the North Lombok Smart Park

Grand Concept Smart Park can be summarized as follows:

- Child-Friendly Areas
- Educational Facilities
- Parenting
- Earthquake Resistant Buildings
- Sustainable environment
- Regional Security
- Comfortable Open Space
- Application of Technology



Figure 2. General Concept of Smart Park

4.2 ZONATION CONCEPT OF AREA

Zoning is an important part of regional planning. In Smart Park North Lombok, the concept of zoning distribution is based on visitor activity patterns. Visitors who have just entered the area will be in the entrance and parking zone. After this zone, visitors will enter the main zone in the form of regional buildings and facilities, bypassing the transition zone first. The function of this transition zone is so that visitors feel the sensations and experiences on the way to the main zone, which is cover by playgrounds in the form of open space. The zoning concept of the area can see in Figure 3.

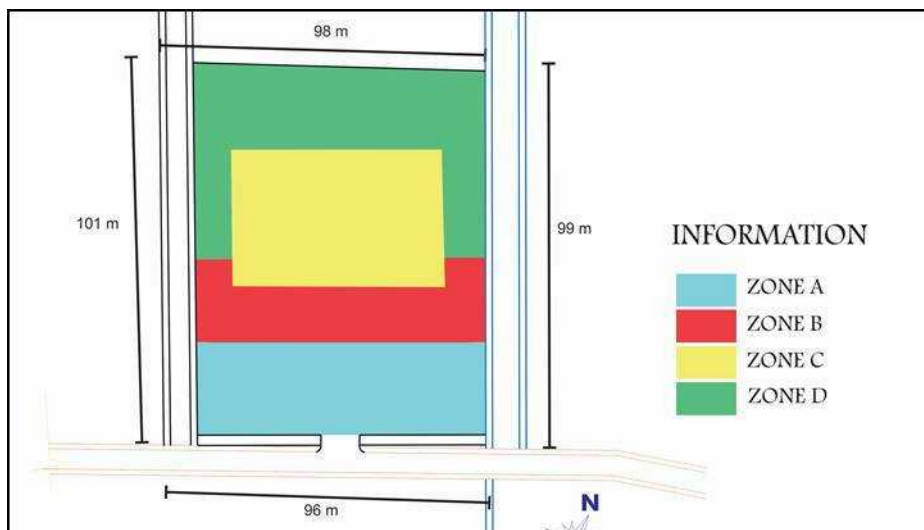


Figure 3. Zonation Concept of Area

The North Lombok Smart Park area is divide into 4th zones, namely:

1. Zone A, is a vehicle entrance and parking zone
2. Zone B, the transition zone
3. Zone C is the main part of the area in the form of a building zone and facilities
4. Zone D, which is an open space zone

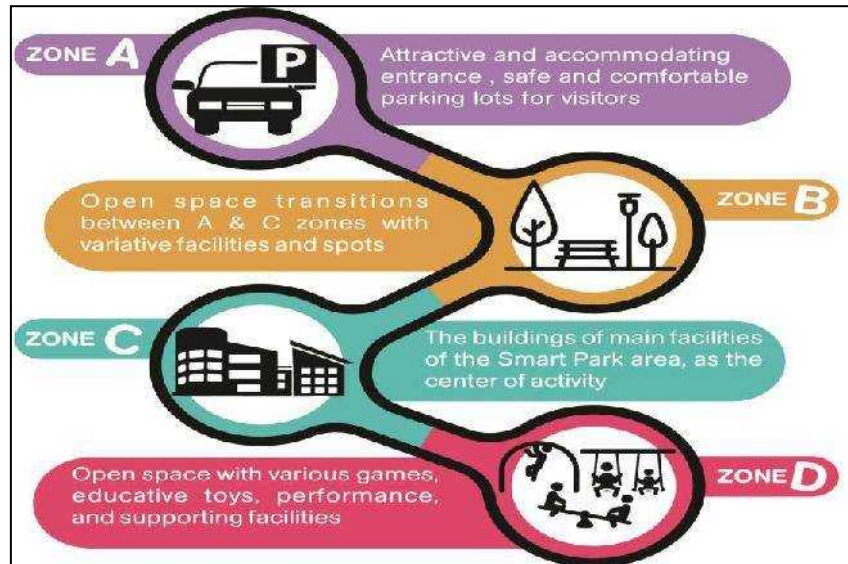


Figure 4. Facilities Based on Zoning

Based on the zoning concept above, an approach is to obtain to analyze building structures that are possible in the existing Smart Park area. This building layout becomes a reference to develop the area both with a direct development system and a phased development system. The layout of this building is mass placement guidelines and regional facilities. The following is a description of the building layout concept in the Smart Park Area (Figure 5):

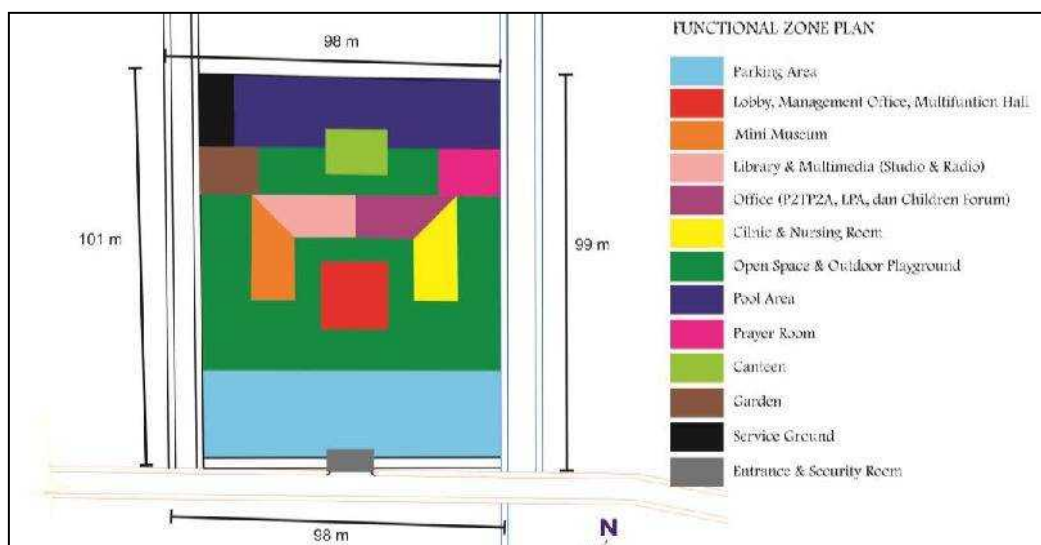


Figure 5. Building Layout Concept

4.3 CONCEPT OF SPACE NEEDS

In the design of the North Lombok Smart Park, several things need to be considered in developing the design concept, including:

1. User Group

Smart Park, North Lombok must be used by various user groups. Because children who come to visit are accompanied by those who are older (parents, grandparents, etc.). Also, several facilities are provided for users with different age ranges. Facilities such as clinics can also be used for mothers and adolescents.

2. Building Functions

There are several types of buildings that will be built, among others, Mini Museum, Art Studio, Reading Park, Office (for the Protection of Women, Child Protection Institutions, and Children's Forums), Health Clinics, Mosque, and service buildings supporting the area. The concept offered to accommodate these different functions is an integrated mass order with good circulation.

3. Green Open Space

apply the concept of environmentally friendly and sustainable. One application is to place a lot of green open spaces in the Taman Pintar area. The concept applied in the green space area is divided into 2, namely:

- Active Open Space: is an open space that has elements of activities in it, for example, playing, learning, sports, and activities carried out by other users.
- Passive Open Space: is an open space that does not contain elements of human activity in it. Passive open space is preferred for visual aesthetics and ecological functions. However, this passive open space can also be used as additional facilities, such as vehicle parking.

The following estimated in the area of space obtained from the translation of the concept of space requirements and analysis. Assuming the area of this space is the minimum area needed to meet the standard according to the function of each building/facility.

1. Main Building

The main building became an icon of the regional built in the middle of the region, the function as a center for information about the area's facilities and the area's management center. This building merges the Multipurpose Hall, which can be used as a meeting place and art arena such as dance, theater, and soon. Like the main building, the design of the Main Building must be eye-catching and apply the traditional architecture of North Lombok. Becingah became part of the building facade, accompanied by a variety of decorations that adopted local wisdom.

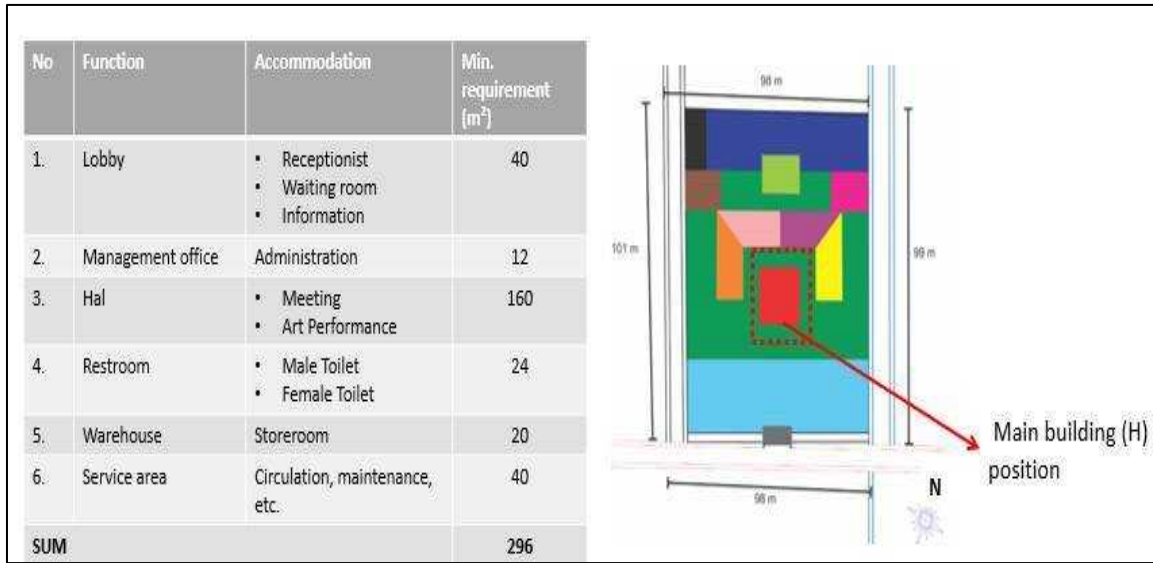


Figure 6. Main Building Space Needs

2. Building 1 (B1)

The main function of Building 1 is as a Mini Museum. In this museum displayed educational collections for children. To display the collectibles, 96 m² of space/display area is provided. This museum is designed to compact, with a small size but can accommodate attractive exhibition activities for children

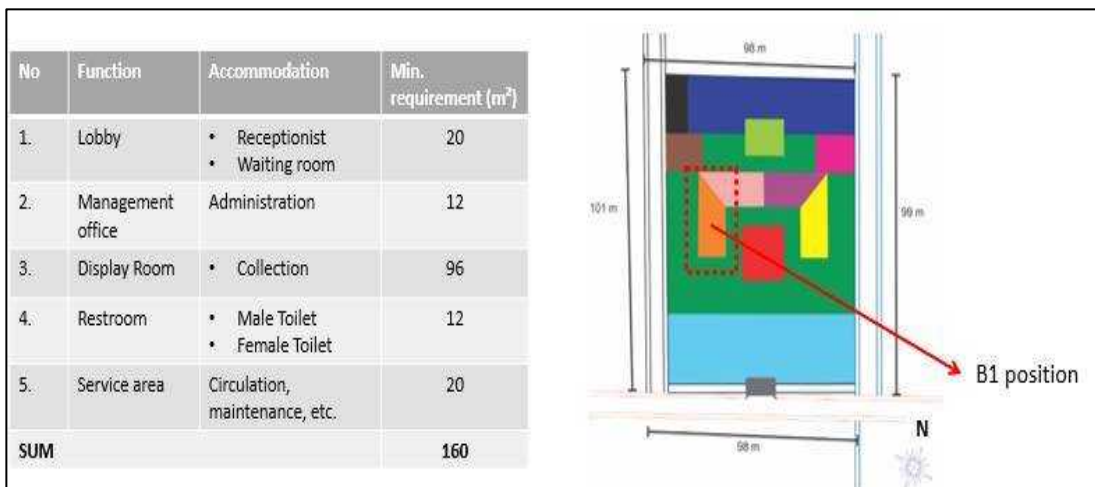


Figure 7. B1 Building Space Needs

3. Building 2 (B2)

The main function of Building G2 is as a library with the concept of Reading Park and Multimedia Room. Reading Park is designed with reading room collection & reading room. With an area of 48 m², the reading room collection area can include 1,000 books for 20 visitors. The multimedia room consists of Studio and Mini Radio. Space Studio Anak supports information technology activities, the internet, the basics of teleconferences. While the Mini Radio Room is a facility to get to know radio technology, digital recording, and broadcasting.

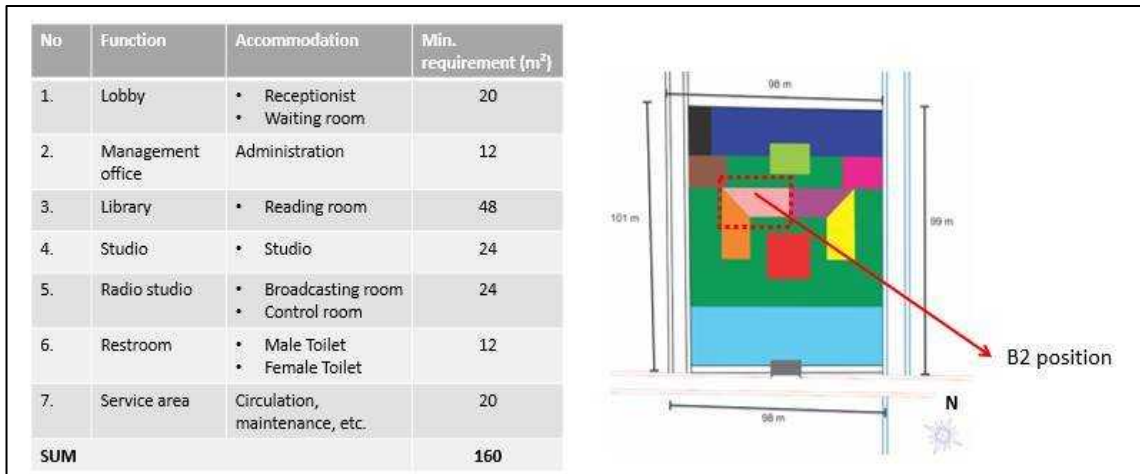


Figure 8. B2 Building Space Needs

4. Building 3 (B3)

Building G3 is intended for the secretariat of several agencies/institutions include an integrated Service Center for Empowering Women and Children, Child Protection Institutions, and Children's Forums. Each secretariat room can accommodate 4-8 staff. Each secretariat room has privacy even though it is incorporated in one building.

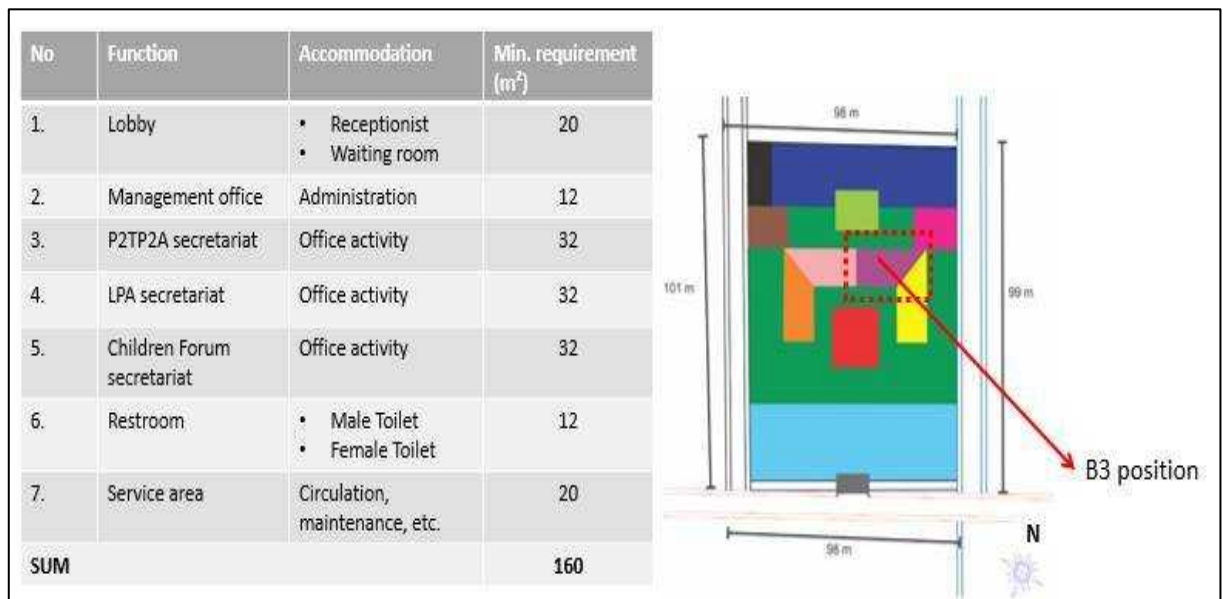


Figure 9. B3 Building Space Needs

5. Building 4 (B4)

Building G4 is a health facility in the form of a clinic and daycare facilities. The health clinic is equipped with a consultation/counseling room and facilities to support mothers. The daycare center is equipped with a playroom and toys/equipment storage area.

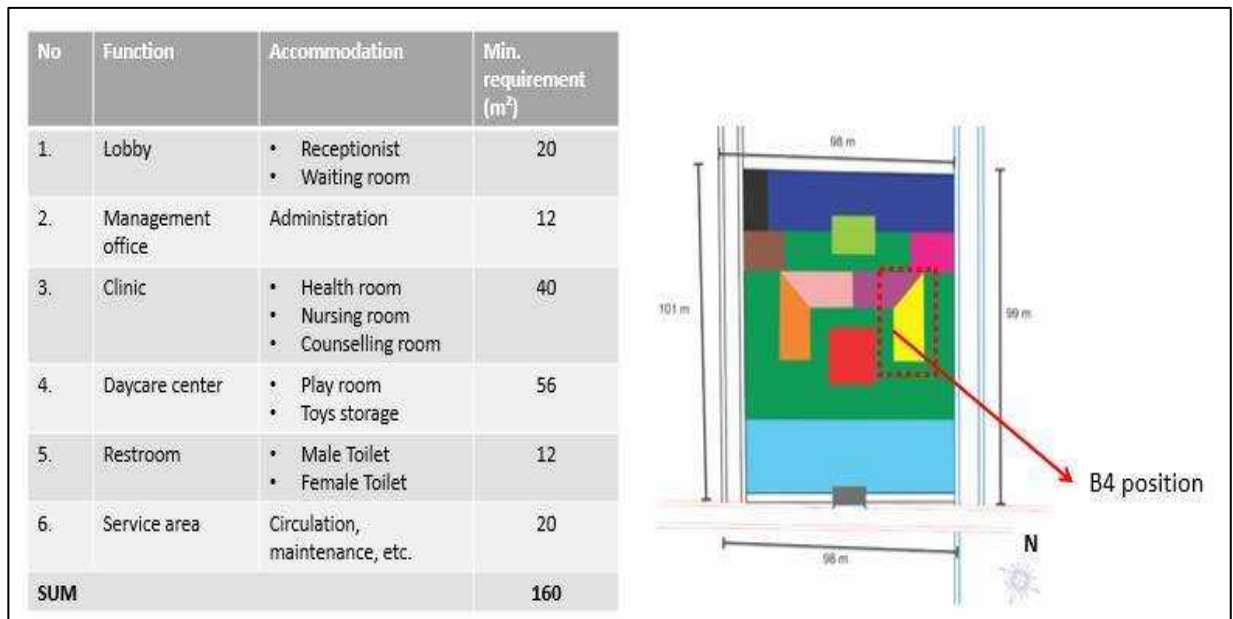


Figure 10. B4 Building Space Needs

6. Swimming Pool, Canteen, and Service area

Swimming Pool, Canteen, and Service Area are located in zone D with consideration of circulation and privacy. The swimming pool area has swimming facilities for children (under 10th years old) and teenagers (10-18 years old) separated between sons and daughters. The canteen is designed concisely, with an open area, accommodating a maximum of 40 visitors. The service area consists of a generator set and water machine service, as well as solid waste service, located with special access.

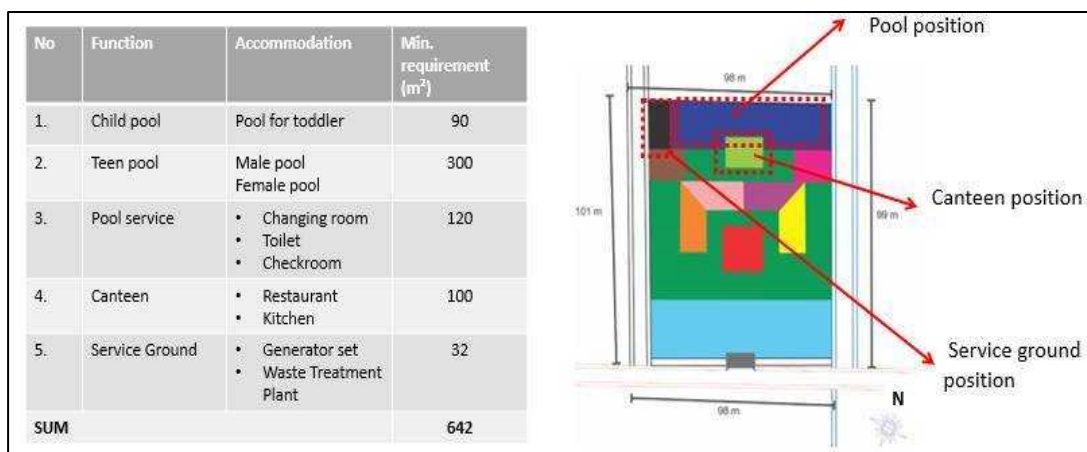


Figure 11. Pool Room need, Canteen and Service Area

7. The Mosque and Gardens

The mosque and gardens are located in zone D, between Zone C and the swimming pool area. The mosque consists of a 64 m² prayer room, an ablution area, and a 36 m² toilet. The garden is a facility consisted of sunflower gardens and rabbit gardens, which is an attraction for lovers of gardening activities and animal lovers.

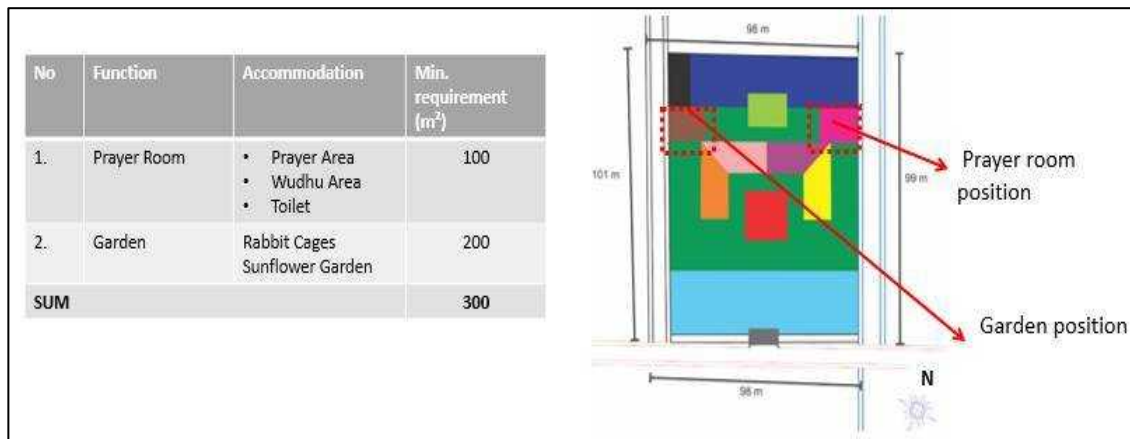


Figure 12. The Mosque Need and Gardens

4.4 CIRCULATION CONCEPT

Circulation in the North Lombok Smart Park Area carries the concept of ease in exploring every part of the Smart Park area. This concept requires that there are paths that can be accessed by visitors from one facility to another. To implement this concept, space configuration is also very important. Therefore, the mass structure of the building will be designed so that the accessibility of the area becomes easy, affordable, and covers all areas.

The main building becomes the ‘core’ area, which is connected to the surrounding buildings (B1, B2, B3, B4). The area is design with easy circulation, well connected, and directly integrated with playgrounds that are spread out in the open space of the area. The open spaces become facilities that are integrating with the building. Starting from entrance/parker, visitors can easily reach any facility you want to visit.



Figure 13. Circulation Concept of Area

Landscape management becomes importing and inseparable from the arrangement of circulation in an area. Softscape and hardscape designs determine the comfort of visitors and how they get a pleasant experience in exploring the region.

1. Softscape is a landscape element consisting of elements of life, which includes flowers, plants, bushes, trees, and soon. The aim is to give landscape garden characteristics, create an impression, atmosphere, and sensitivity to the people around them.
2. Hardscape is a hard landscape material built to form the atmosphere in an environment that incorporated in the landscape. This hardscape consists of rocks, which are often used as supporters of the beauty of the Park, for example, natural stone slabs with irregular shapes and compositions that can function as footpaths.

4.5. ARCHITECTURE CONCEPT

4.5.1. BUILDING MASS LAYOUT

The shape of the building greatly influences the impression and perception of people who see the building. Determination of the shape of the building is determined by the function, character to be display, and as existing local wisdom. The buildings in Smart Park North Lombok have interesting, attractive, and modern concepts, without leaving the traditional architecture of North Lombok.

One of the important elements in determining the composition of a building is the building facade.

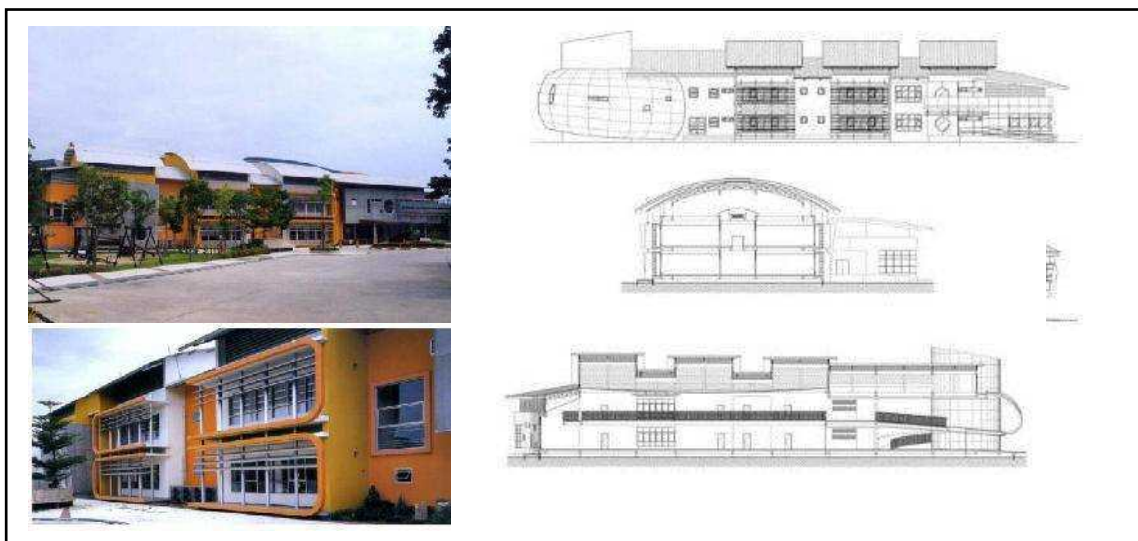


Figure 14. Examples of building facades for Children's Facilities in Patumthani, Thailand
Source: Schools and Kindergartens: A Design Manual (2007)

As an attractive facility designed for children, the building facade concept in this area is a facade that emphasizes creativity and dynamic.

Especially for the main building, the facade is decorated with “becingah” ornaments, as a characteristic of North Lombok Architecture. Becingah is also philosophically a place of entry that has the concept of hospitality in welcoming guests. The shape of the roof resembles the roof of the Ancient Bayan Mosque, as a symbol of local wisdom in North Lombok.

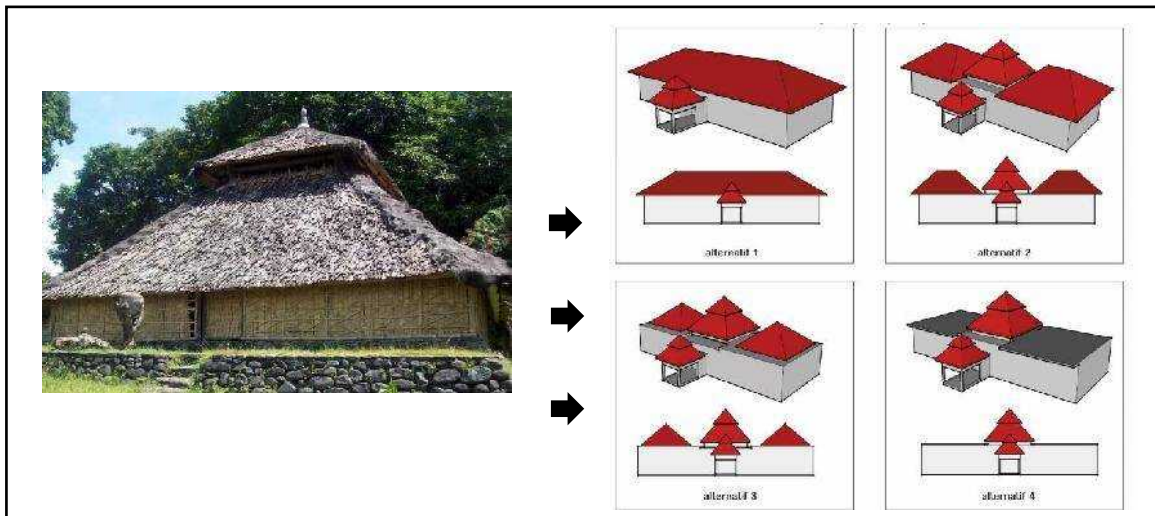


Figure 15. Applying the concept of becingah from the philosophy of the Bayan Mosque roof
Source :

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4.5.2. INTERIOR

- 1) In the use of facilities that are implemented and can be used for children, it must be by the needs at the age of the children. Dimensions and shapes must adjust to the user's age. This is because the activities of children in the room are very concerned about dimensions, comfort, and safety.



Figure 16. Activities at children's facilities

Source: Schools and Kindergartens: A Design Manual (2007)

- 2) To determine the exact dimensions, reference the existing standards. Facilities at Smart Park North Lombok are for children and some for adults. All furniture will adjust who uses it. Standard can refer to the Time-Saver Standards for Architectural Design Data. The following are

the standard sizes for humans, both adults, and children, according to the Time-Saver Standards for Architectural Design Data.

- 3) Furniture is one part of the North Lombok Smart Park infrastructure used in activities within buildings and existing facilities. Judging from its function, the types of furniture can be group into:
 - a) A child learning support furniture, such as tables and chairs for children, cupboards or shelves for playground storage, children's lockers, display boards for children's work, shoe racks, bag hangers, etc.
 - b) Furniture supporting institutional activities, such as management tables and chairs, guest tables and chairs, cabinets, children's data storage racks, and others.
- 4) Furniture adapted to the needs and demands of children's activities in learning activities through play. For example, the number of lockers is adjusting to the number of children in an age group. The size and shape of the furniture are adjusted by the Anthropometry and Ergonomics factors.
 - a) Anthropometry learns how to determine furniture size based on the dimensions of the child's body.
 - b) Ergonomics learns how to determine the shape and size of furniture based on consideration of the convenience of students to carry out activities.
- 5) Several things need to be considered so that children are comfortable using tables and chairs, namely:
 - a) The size of a child's chair leg height is the same as the child's foot length from the sole to the knee so that the sole is flat with the floor, and the bottom of the thigh does not compress the seat.
 - b) Enough distance between the bottom of the table with the child's thigh
 - c) Position the elbow approximately the same height as the tabletop
 - d) Backrest for the back just below the shoulder blade
 - e) Sufficient between the backrest and seat area
- 6) Material selection must be made from local materials that are strong and easily available.
 - a) For materials from wood, hardwoods that are not easily weathered are used, such as teak wood, mahogany, nyatoh, etc. For materials from metal or iron must be rust-resistant and strong.
 - b) For the selection of materials to be used must ensure the safety and comfort of children.
- 7) Recommended sizes (Astrini, 2005: 4, 9-10), namely:
 - a) Tables of size $p = 120$ cm, $l = 75$ cm, and $t = 47-50$ cm.
 - b) Chair size $p = 32-35$ cm, $l = 27-30$ cm, and $t = 30$ cm.
 - c) The rack of educational equipment is $p = 150$ cm, $l = 40$ cm, and $t = 65$ cm.
 - d) The shelf for storing students' belongings (lockers) is a large rack with boxes. The size of each box, namely $p = 30$ cm, $l = 30$ cm, $d = 35$ cm, and $t = \pm 100$ cm (three levels).
 - e) The height of the table/shelf for activities carried out while standing is about 60 cm.
 - f) Height of reach of children to furniture, average 121 cm, maximum 133 cm.
- 8) Children's table and chair standards according to the Ministry of Education and Culture of the Republic of Indonesia 1992:

The following interior concept is expecting in the buildings and facilities in Smart Park:



Figure 17. The Concept of Interior Children's Facilities
Source: Architecture for Children (2010)

4.6. SMART PARK DESIGN

Based on the deepening of concept and analysis, the design of the North Lombok Smart Park was obtained. The following is the design of the North Lombok Smart Park.

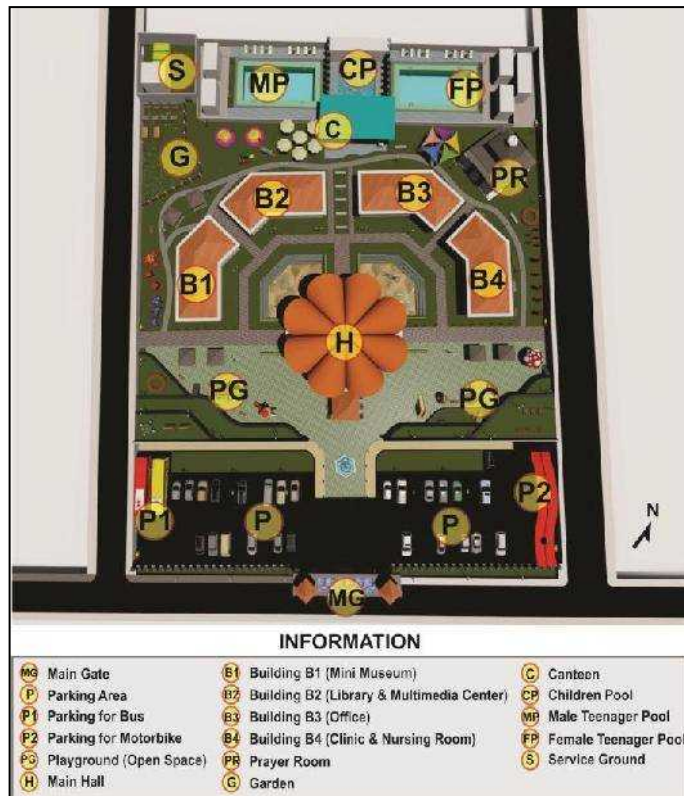


Figure 18. Masterplan of North Lombok Smart Park



Figure 19. Area Perspective



Figure 20. Smart Park Main Building



Figure 21. Children's Play Facilities



Figure 22. Swimming Pool and Canteen Facilities



Figure 23. Flower and Rabbit Garden

5. CONCLUSION

The conclusion of this paper is the existence of this Smart Park:

- a. Provide a place for children and especially children from families who cannot afford to:
 1. Get the opportunity to learn technology, especially computer equipment
 2. Developing talent / developing artistic creations

3. Gaining skills

4. Opportunities to read knowledge books, storybooks in the village library,

5. Get a comfortable and safe playground,

6. As a place for recreation.

b. Provide opportunities for parents to increase their knowledge through technology (computers) and reading books so that they can accompany and direct their children in getting education/knowledge in Taman Pintar.

c. Meet the needs of children to support the city as a child-friendly city development location

In essence, the design of the Smart Park will help children's mental and social development well and will make children healthier and happier. And in the end, children as the successor to the nation will become a reliable driver to develop towards a developed and prosperous Indonesia.

6. ACKNOWLEDGEMENT

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