Canopy 12 (1) (2023)

CANOPY: Journal of Architecture

http://journal.unnes.ac.id/sju/index.php/Canopy

SPECIAL NEEDS SCHOOL WITH GREEN-UNIVERSAL DESIGN CONCEPT IN BOGOR REGENCY

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Abstract.

Bogor Regency is included in The Province of West Java which has the highest amount of children with special needs (disability) in Indonesia. Based on the indication of National Economic Survey Data (SUSENAS), by the year 2018, 3 of 10 children with disability never really attend formal study at school. Until 2019, the number of children with disability that never attended school reach 400,000 children. One of the causes of many children with disability never attending school is that they are indicated as the 40% poorest families in Indonesia. Other than financial problems, the lack of learning facilities like special needs schools is also becoming the cause of many children with disability never really attending school life. The number of special needs schools in 2019 is only 1.861 in Indonesia. That is inversely proportional to the number of children with disability that reach the number 500,000 children by the year 2019. Special needs school is a learning facility for children with certain disabilities. Special needs school is made as a place for children with disabilities to study and improve their certain interests and talent just like normal children did. The building of special needs school is expected to be a place that can be used by the user without exception. The application of a universal design concept is suitable for special needs school buildings. Other than that, the application of green architecture is also needed to create a good environment.

Keyword: *Bogor Regency, Disabilities children, Special Needs School, Universal Design, Green Architecture*

Published July 2023

CANOPY Journal of Architecture

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e-ISSN 2503-0655
ISSN 2252-679X

INTRODUCTION

The amount of special needs children in Indonesia is increasing particularly year by year. According to The United Nations (UN), 42,8 million children in Indonesia are a school age (5-14 year), while Unicef of Indonesia estimates that by t019, 0,8% of the number children in Indonesia are children with special needs (disability), so the children with special needs in Indonesia are approximately 400,000 children.

Based on the indication of National Economic Survey Data (SUSENAS), by the year 2018, 3 of 10 children with disability never really attend formal study at school. Until 2019, the number of children with disability that never attended school reach 400,000 children. One of the causes of many children with disability never attending school is that they are indicated as the 40% poorest families in Indonesia.

Besides that, with the high number of disabilities children in Indonesia that almost reach 500,000 children, inversely proportional with the number of learning facilities such as special needs school. By the year 2019, only 1,861 special needs school is legally counted In Indonesia national government system. If that compare to the number of the children with disabilities, that number of facilities are surely deficient for all of the children with disabilities in Indonesia to study.

Other than the number of school that not enough for their students and also the location that is uneven, the special needs school is also have some problem with the facilities inside. One of it was the acces for the sanitation facilities in school. Based on the unicef of Indonesia data at 2019, only 73% school that has the certain toilet for students with only 43% of it that has separate area for female and male students.

As an example is Bogor Regency that is one of the regency in The Province of West Java. Based on the resident data, the disabilities data in west java has the highest number in all country. By the resident date of 2010, west java is one of the province that has the highest number of children in disabilities in all country that the number almost reach 100,000 children.

The problem of the minimal and unequal existence of SLB in terms of the number of ABK numbers in the school year and the quality of SLB that does not meet standards is one of the reasons for the need for an SLB building with adequate standards to facilitate and accommodate ABK in gaining knowledge which is one of their rights as Indonesian citizens. To support all the activities and needs of the students later, the Universal Design approach is considered appropriate to be applied to the planning and design of this SLB building..

Therefore, it is necessary to have a building that will become a learning center with facilities that meet complete standardization to support ABK learning in the Bogor Regency area that is able to meet the needs and accommodate the needs of these ABK children in gaining knowledge with the abilities and skills of each child.

MATERIAL AND METHODS

The method that will be used in the preparation of this Final Project Report (LPA), is to use a descriptive method, by explaining, explaining and explaining related to design requirements and conditions in the planning and design of Special Schools with the Green-Universal Design Approach in Bogor Regency. From the existing terms and conditions, then proceed with the collection of data needed in the planning and design. Then the existing data is analyzed and conclusions are drawn.

The conclusion from the discussion and analysis is in the form of basic concepts used in the planning and design of Special Schools with the Green-Universal Design Approach in Bogor Regency as the basis for architectural graphic design. The data used in the planning and design of Special Schools with the Green-Universal Design Approach in Bogor Regency can be grouped into 2 categories, that are:

a. Primery data
   Primary data was obtained through conducting observations on the location and site of the planning and design of Special Schools with the Green-Universal Design Approach in Tangerang Regency.
b. Secondary data
   Secondary data was obtained through literature studies from books and other written sources related to the planning and design of Special Schools with a Green-Universal Design Approach in Tangerang Regency, as well as technical standards

Concept

Definition of Special School

Etymologically Special Schools (SLB) come from the Indonesian language which, based on the Big Indonesian Dictionary (KBBI), means educational facilities specifically organized for students with physical and/or mental disabilities. In the Encyclopedia of Disabilities on Special Education, the definition is given: "Special education means specifically design instruction to meet the unique need of a child with disability". So it can be concluded that SLB is a learning facility that is specifically designed with the aim of meeting the special and unique needs of children who have physical and/or mental limitations. The education system in SLB itself is a unit system consisting of preparatory education levels, basic education, and further or vocational education levels.

SLB Building Requirements

Based on the Regulation of the Minister of National Education Number 33 of 2008 concerning Standards of Facilities and Infrastructure for Special Elementary Schools (SDLB), Special Junior High Schools (SMPLB), and Special High Schools (SMALB), the requirements and standards for the construction of SLB are:

a. Each SDLB has facilities and infrastructure that can serve a minimum of 6 (six) study groups as well as students with one or several disabilities.
b. Each SMPLB has facilities and infrastructure that can serve a minimum of 3 (six) study groups as well as students with one or several disabilities.
c. Each SMALB has facilities and infrastructure that can serve a minimum of 3 (six) study groups as well as students with one or several disabilities.

SLB Building Site Standards

a. Site area can be used effectively in constructing buildings, playgrounds, and sports areas.
b. The site is located in a location that can provide easy access to health facilities.
c. Site is located in a location that has access for rescue in an emergency, especially with four-wheeled vehicles, and can avoid potential threats to health and safety of the soul.
d. The site has an average slope of less than 15%, is not on a demarcation line, and has railroad circulation.
e. Site is in a location that can avoid water pollution, noise, and air pollution.
f. The site meets the requirements for the location designation that have been regulated in the Regional Regulation regarding the RTRW or other plans that are more detailed and binding and obtain a site use permit from the local regional government.
g. The site has the status of site rights, and/or has a permit to utilize site rights holders in accordance with statutory provisions.
h. The site area meets the criteria for the minimum site area based on the level of education.

SLB Building Standards

a. The building meets the minimum building floor area requirements.
b. The building complies with the provinsions of the building code consisting of :
    - KDB with a max value 30%
    - KLB and the max height of the building stipulated in the regional regulation
    - The free distance of the building includes the boundary line of the building
c. The building meets the following safety requirements :
    - Has a stable and sturdy construction up to maximum loading conditions to support live and dead loads as well as for zone areas, the ability to withstand earthquakes and other natural forces
    - Equipped with an active and/or passive protection system to prevent and deal with fire and lighting
d. The building meets the following health requirements :
    - Have adequate facilities for air ventilation and good lighting
    - Have sanitize inside and outside the building which includes clean water supplies, black water arrangement, garbage, and rain arrangement.

e. The building meets the following accessibility requirements :
   - Provided easy, safe and comfortable facilities and accessibility for the person with disabilities who have mobility difficulties including wheelchair users
   - Equipped with guiding blocks for the blind users

f. The building meets the following comfort requirements :
   - Building is capable oof absorbing disturbing vibrations and noice that disturbing the learning activity
   - Every room has good ventilation
   - Every room has lighting

g. Building can have more than one floor if stairs and ramps are provided for the comfort and safety of the users with wheelchair.

h. Building is equipped with security system such as :
   - Warning of danger users, emergency exits, and evacuation routes in the event of a fire/or other disaster.
   - To evacuation that can be reached easily and is equipped with clear directions.

i. The building is equipped with an electrical installations with minimum power of 900 watts.

j. The construction of a new building or space must be design, implemented and supervised professionally.

k. The minimum permanent building quality is class B and can last minimum of 20 years.

l. Maintanance as :
   - Light maintenance includes repainting, repairing some shutters/doors. Floor coverings, roof coverings, ceilings, water and electricity installations, carried out at least once in 5 years.
   - Heavy maintenance, including replacing roof trusses, ceiling trusses, wooden frames, sills, and all roof covering is carried out at least once in 20 years.

m. The Building has to be accompanied by building permit and usage permit in accordance with the provinsions of the applicable regulations.

Definition of Green-Universal Design

A. Definition of Green Building

Green Building are healthy place to live and work and also a building that has the mininum energy from the planning, building, and using view that has less effect for the environment. The point of the implementation such as : the using of sustainable material, the connection to the local ecology, concervation energy, water efficiency, waste management, connection to the environment, and also recycle and reuse.

B. Definition of *Universal Design*

Universal Design is a design concept that create facilities and product for all the people as a general user without the physics and gender exception. Universal Design have some design principles such as : Equitable use, Flexibility in use, simple and intuitive use, preseptible information, tolerance for error, low physical effort, size and space for approach and use.

PLANNING LOCATION

FIGURE 1. Data Site

The Data of the Site are :

Location	:	Jl. Raya Kota Wisata, Kelurahan Ciangsana, kecamatan Gunung Putri, Kabupaten Bogor.
Area	:	27.200 m^2
KDB	:	Maksimal 50%
KLB	:	Maksimal 4
KDH	:	Minimal 17%
KTB	:	38 m

The site boundaries are:

North	:	Boulevard Streets of Kota Wisata
South	:	Kota Wisata Streets
East	:	Boulevard Streets of Kota Wisata
West	:	Parking Lot

CONTEXTUAL ASPECT APPROACH

Accessibility

Responding to the context of the site, accessibility on the site is divided based on its function, namely accessibility for pedestrians, vehicles and goods.

a. The main entry and exit accessibility for pedestrians is on the east side of the site which is oriented towards the center of the virtual line axis which is the orientation of the planning of this building. In addition, pedestrians also have access through the main entrance and exit of visitor vehicles. There are several entry options used to facilitate access for pedestrians. All pedestrian access (sidewalks) are equipped with tacticle paving or blind (yellow) paths.
b. Main entrance access for visitors is on the south side of the site which is directly connected to Jalan Raya Kota Wisata. The main entrance area was chosen after going through a series of road user analysis in order to achieve results that facilitate and provide efficient access to its users. Meanwhile, the main exit area is located on the opposite side of the main entrance area, namely the north side of the site.
c. Access in and out of the service vehicle is opposite to the access in and out of visitors' vehicles, the service vehicle entry access is on the north side of the site while the exit access is on the south side of the site.

Climatology

The shape of every building mass is designed to be as thin as possible, so the building not became very massive and also hot in inside. Every room inside the building is also using the cross-ventilation system to maximize the thermal comfort inside the room.

ARCHITECTURAL ASPECT APPROACH

Building Mass

The massing building concept is starting by searching for the most optimal shape with a focus to the comfort and safety of all of the residents (students with disabilities) so it needed a site and building mass that centralized by using the virtual line that the axis point is taken from the interconnection streets along the site. After that, the first massing needs to be subtracted to create some separate buildings that separated by the resident and their activities.

The Face of the building

FIGURE 2. Perspektif void area

The looks of the building mass is dominated by the glass windows as an output from the climatology analysis to maximize the natural sunlight that came inside the building. Besides, the using of glass windows is also good to minimalize the amount of electricity that should be used by the day that also became one of the implementation from the green design concept.

FIGURE 3. Perspektif balcony area

For the open side of the building such as the balcony and ramp, the addition of the secondary skin is needed which is not only good for minimalizing the amount of solar thermal that came to the inside of the building. Other than that, the secondary skin is also needed to secure the resident of the school that majority is the children with disabilities that they can always be safe.

DESIGN RESULTS

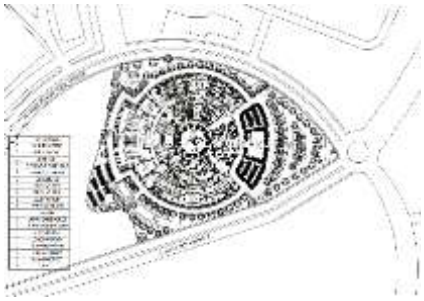

FIGURE 4. Siteplan

FIGURE 5. Situation

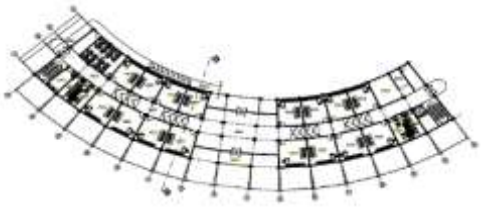

FIGURE 6. Elementary Layout Floor 1

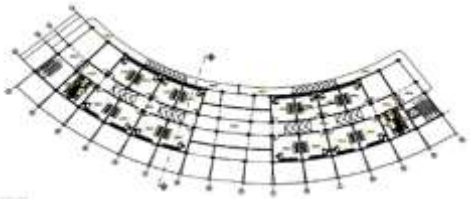

FIGURE 7. Elementary Layout Floor 2

FIGURE 8. Elementary Layout Floor 3

FIGURE 9. JHS Layout Floor 1

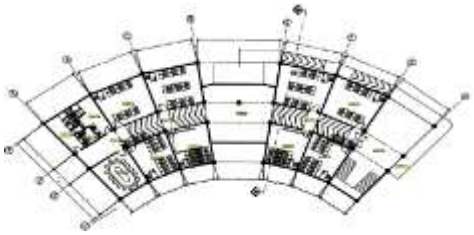

FIGURE 10. JHS Layout Floor 2

FIGURE 11. SHS Layout Floor 1

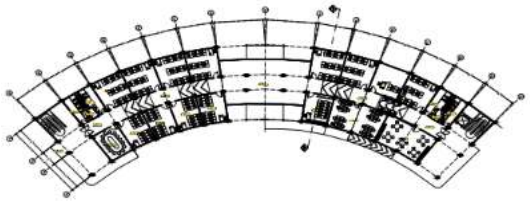

FIGURE 12. SHS Layout Floor 2

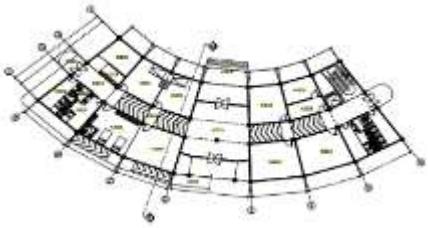

FIGURE 13. Therapy Building Layout Floor 1

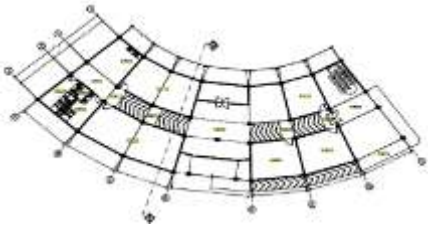

FIGURE 14. Therapy Building Layout Floor 2

FIGURE 15. Management Building Layout Floor 1

FIGURE 16. Management Building Layout Floor 2

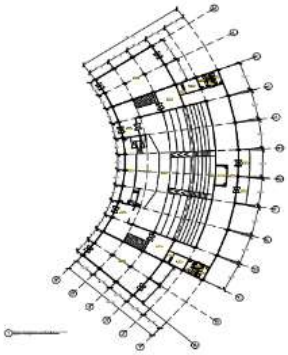

FIGURE 17. Auditorium Building Layout Floor 1

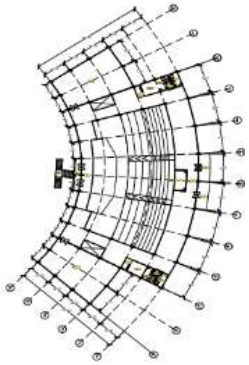

FIGURE 18. Auditorium Building Layout Floor 2

FIGURE 19. Elementary Front Facade

FIGURE 20. Elementary Back Facade

FIGURE 21. Elementary Right Facade

FIGURE 22. Elementary Left Facade

FIGURE 23. JHS Front Facade

FIGURE 24. JHS Back Facade

FIGURE 25. JHS Right Facade

FIGURE 26. JHS Left Facade

FIGURE 27. SHS Front Facade

FIGURE 28. SHS Back Facade

FIGURE 29. SHS Right Facade

FIGURE 30. SHS Left Facade

FIGURE 31. Therapy Front Facade

FIGURE 32. Therapy Back Facade

FIGURE 33. Therapy Right Facade

FIGURE 34. Therapy Left Facade

FIGURE 35. Management Right Facade

FIGURE 36. Management Left Facade

FIGURE 37. Management Front Facade

FIGURE 38. Management Back Facade

FIGURE 39. Auditorium Front Facade

FIGURE 40. Auditorium Back Facade

FIGURE 41. Auditorium Right Facade

FIGURE 42. Auditorium Left Facade

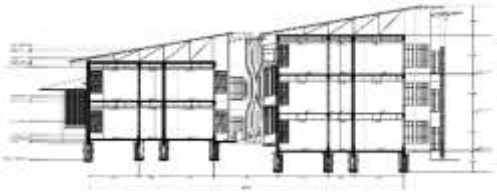

FIGURE 43. Section A-A Therapy-Elemtary Buiding

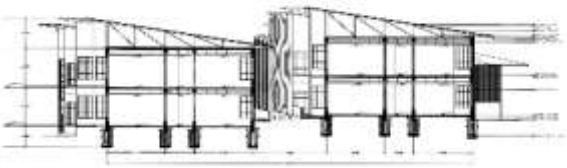

FIGURE 44. Section B-B JHS-SHS Building

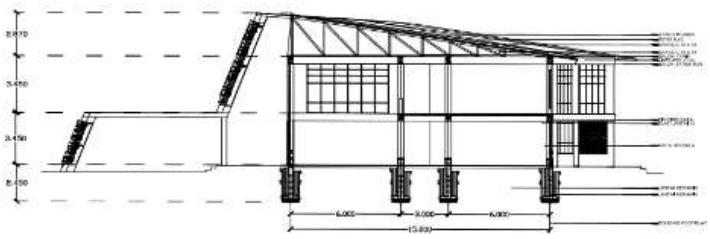

FIGURE 45. Section C-C Management Building

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