

The Concept of Behavior Settings as a Criterion for the Design of Rehabilitation Centers for the Blind in the City of Bandung

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ABSTRACT

Keywords: blind, orientation, mobility, behaviour setting, criteria.	Blind people who are included in the category of people with disabilities experience impairments and obstacles to their sense of sight. To be able to do orientation and mobility, blind people need information about environmental concepts and self-concepts. This of course requires rehabilitative training. Sentra Wyata Guna Bandung is a building that functions as a rehabilitation and training centre for blind people so that they can play an active role in community life. But in reality, the design of Sentra Wyata Guna has problems in terms of comfort and safety for blind people to do activities in it. This can hinder the rehabilitation and training process in it. This research aims to understand the behavior and needs of blind people for orientation and mobility with the concept of behavioral architecture; and find how the physical environment can stimulate the non-visual senses of blind people. This concept will be divided into five architectural design criteria based on behavioural setting theory. The study started with a literature review on the needs of blind people and behavioural concepts specific to blind people. Field data analysis detected the problems and potential of the Sentra Wyata Guna building.
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Introduction

Visually impaired people are included in the category of people with physical disabilities who experience disorders and impairments in their sense of vision (Taranusyura, 2020). Based on their level, visually impaired people are divided into two categories (Atika, Arsely, Caniago, Julisti, & Asvio, 2023), namely total blindness and partial blindness (low vision). Total blindness is those who cannot see at all or can be said to have completely impaired vision, while partial blindness is those who have limited vision; Therefore, vision aids (glasses, magnifying glasses, etc.) are needed. The loss of the sense of vision makes blind people have no concept of themselves and the concept of the surrounding environment (Istanti, 2019). So visually impaired people tend to be unable to do activities and play an active role in community life.

According to the Ministry of Health of the Republic of Indonesia in 2010 (Bonita, 2020), 1.5% of the total population in Indonesia is completely blind. With the large number of people with visual impairments in Indonesia, there are not only physical problems that need to be met but also social problems that need to be overcome. In reality, visually impaired people have differences from normal people, not only because of vision problems but also because of their mental and psychological disorders. Because some people consider that visually impaired people are individuals who depend on others and cannot live independently. This attitude shows that there is discrimination against people with visual impairments in community life (Wardiana, Sumardi, & Mustari, 2023).

These problems can be overcome if there is a place for a rehabilitation program to improve the quality of the visually impaired community in Indonesia (Naibaho, Krisnani, & Nuriyah, 2015). The rehabilitation can be done directly or indirectly. In Indonesia, there is already a disability social rehabilitation centre under the Ministry of Social Affairs of the Republic of Indonesia which has the task of providing guidance, services, and rehabilitation for visually impaired people to be active and active in community life, namely the Social Rehabilitation Center for Persons with Disabilities (Sentra). The centre is a temporary residence for the visually impaired to learn, and get social rehabilitation through social guidance, mental guidance, mobility orientation guidance, and skills training (Apsari & Raharjo, 2018).

The centre is in charge of rehabilitative efforts that lie in the condition of social problems of the visually impaired. Rehabilitation is provided in the form of psychosocial motivation and diagnosis, treatment and nurturing, vocational training and entrepreneurial coaching, spiritual mental guidance, physical guidance, social guidance and psychosocial counselling, accessibility services, social assistance and assistance, resocialization guidance, further guidance and/or referral (Law No. 11 of 2009 concerning Social Welfare).

The Wyatt Guna Center is the oldest, largest, and widest blind disability centre in Indonesia. Today, the Wyata Guna Center still maintains the original design of the building. The initial design of this building has weaknesses and also advantages. The advantage is that the design of the building is already in a tropical architectural style with roofs, terraces, and building materials that are suitable for the tropical climate in Indonesia. The disadvantage is that the design of the building is not based on the needs of the visually impaired. This can be seen from the many architectural elements that are not friendly for the visually impaired to work in.

Therefore, a special design is needed for the blind disability rehabilitation building to provide comfort and safety for its users in their activities. This research is aimed at making design criteria for special buildings for the visually impaired at the Wyata Guna Center in Bandung. This research will use the theory of behaviour setting for the visually impaired to understand the behaviour and needs of the visually impaired and apply it to the concept of design criteria of the Wyata Guna Center. With the new Wyata Guna Center design concept and criteria, it is hoped that the quality of rehabilitation services will be improved and produce graduates who can be independent and play an active role

in community life. (Decree of the Minister of Social Affairs of the Republic of Indonesia No. 50/HUK/2004).

Research Methods

The method used in this study is qualitative with a descriptive approach method based on case studies. This approach begins by collecting theoretical foundations in the form of the needs of the visually impaired and the concept of special behavioural architecture for the visually impaired; which was followed by a precedent study. The next step is field observation to get design criteria and solutions. The data collection technique is taken from several sources, namely:

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Searching for the concept of the visually impaired and the concept of a special behavioural architecture for the visually impaired to obtain the needs and characteristics of the visually impaired.

Field Observation

Searching for field data by reviewing directly to the research area so that it can be continued to the analysis stage where the results are used as design criteria.

Formulate Design Criteria

The results of the analysis between literature studies, precedent studies, and field observations.

Results and Discussion

The Concept of Blind People

According to Kaufman and Hallahan (Damayanti, 2015), visually impaired people are people with visual acuity below 6/60 and use their sense of touch and hearing to carry out activities. According to KBBI Online, the word blind is unable to see or be blind.

Blindness can be caused by many factors and depends on the geographical location of a country, economic status, social status, and age. In developing countries such as Indonesia, blindness is caused by Trachoma disease (an eye infection caused by the bacterium Chlamydia Trachomatis). According to the World Health Organization (WHO), people with visual impairments have the following classifications:

1. Medium - people with visual acuity below 6/12 to 6/18
2. Moderate - away with visual acuity below 6/18 - 6/60
3. Weight - people with visual acuity below 6/60 - 3/60
4. Total Blindness - people with visual acuity below 3/60.

To move and move places, visually impaired people use orientation and mobility skills. Orientation and mobility are the ability to know a person's position in an environment and relate to other individuals. Orientation and Mobility require mental readiness and cognitive processes from people with visual impairments to be able to move independently and safely (Malik, Abd Manaf, Ahmad, & Ismail, 2018).

Concept of Behavior Setting

Behavioural settings are an advanced concept of behavioural and environmental architecture. The concept of behavioural and environmental architecture itself is the concept of interaction between humans and their environment which is based on the approach of human reason which has perceptions and decisions in every action (Yustiara & Nirwansjah, 2019). Behavioural settings according to Chaerulnik (Setiawan, 2024) are the interaction between activities and available places.

Behavioural settings are used when the architecture in which there is a group of people as subjects who have different behaviours, and decisions and depend on the values formed by the group. Each individual in the group has behaviours that can be seen from actions, interactions, and physical contact with fellow humans or the environment (Laurens, J. M., 2004)

There are five aspects of Architecture criteria (Setiawan, 2024) (that can affect the behaviour of its users or vice versa, namely:

1. Space - the physical design of the building's interior and exterior spaces
2. Shape and Size – the size of the space and the shape of the space according to its function and user
3. Furniture Management - the arrangement of furniture based on its functions and user needs
4. Color - the role of colour in the design of interior and exterior spaces
5. Sound, and Lighting - sound and lighting are required based on the function and user of the building

Character and Behavior of Blind People

The characters and behaviours of visually impaired people (Poedjioetami, Yunia Ferdani, & Junaidi Hidayat, 2021) are:

1. Experiencing movement impairment due to vision limitations
2. People with disabilities use linear circulation
3. The visually impaired uses a cane that is moved right and left
4. To find out the conditions of the surrounding environment, visually impaired people use non-visual senses
5. Blind people tend to be quiet and shy.

Needs of Blind People

Visually impaired people have difficulties in mobility, orientation, and mobility. Therefore, an architectural design is needed based on the needs of the visually impaired so that the visually impaired get enough information for activities, orientation, and mobility. According to Setiawan (Wijayanti, Iswati, & Nirawati, 2019), five variables of architectural design are influenced and influenced by human behaviour, which are as follows:

1. Space - the existence of material variations (aroma, sound, texture) in the interior and exterior spaces of the building. It can be used as a space function differentiator, a sign of the position of the visually impaired, and a directional indicator for the visually impaired

2. Shape and Size - uses rectangular geometric shapes, both building shapes and architectural element shapes with blunt angles on each side. Avoid circular and triangular shapes for the mass shape of buildings and spaces.

The circulation width of the special room for the visually impaired based on PERMEN PUPR No. 14/PRT/M/2017 is a minimum of 1200 cm for the two-way circulation of the visually impaired and 1800 cm for the two-way circulation of other persons with disabilities.

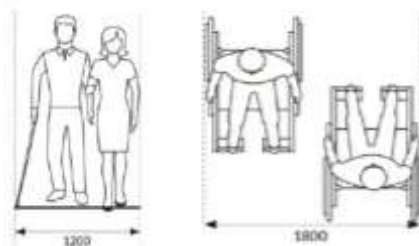
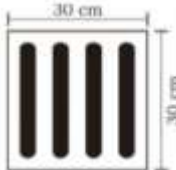
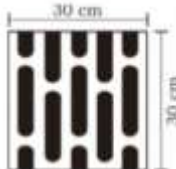
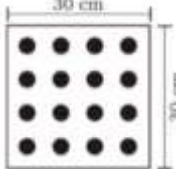
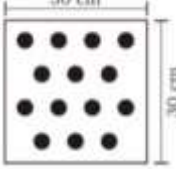


Figure 1. Circulation Width Dimension

In the inner and outer spaces, there is a guide strip with a tile measurement of 30 cm x 30 cm.

Table 1
Guide Strip

	Line motif tiles to indicate the direction
	
	Circle motif tiles to provide warning signs of danger or change in situation
	
Source: PERMEN PUPR No. 14/PRT/M/2017	

For stairs, the height of the steps is not more than 18 cm and not less than 15 cm. The width of the steps is at least 30 cm with a non-slip material. The stairs are given handrails equipped with braille letters at the top.

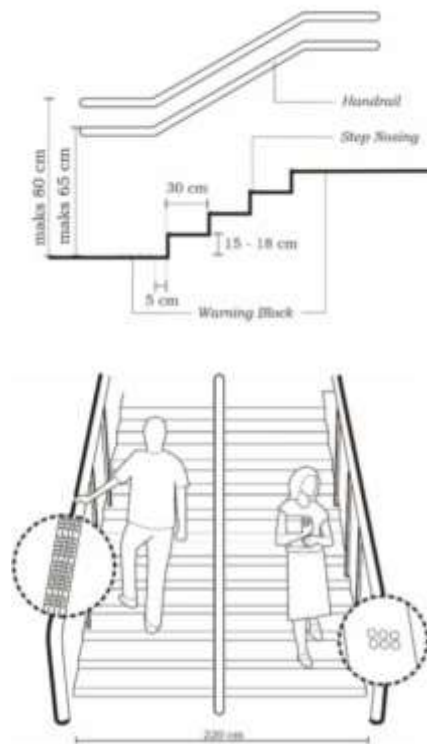


Figure 2. Standard Size of Stairs

Source: PERMEN PUPR No. 14/PRT/M/2017

- Furniture Management – the placement of furniture is based on its ergonomics and function of the space. Furniture must use materials that are safe and easily recognizable by the visually impaired.
- Color-Partially blind people are very sensitive to colour, so a combination of warm colours and common colours (yellow, green, blue, red) is used as a code for orientation and mobility
- Sound and Lighting - Every room for the visually impaired must be able to reflect sound and there is a variation in the acoustics of the space through the use of materials and the height of the space. As for indoor lighting, it must have an intensity between 50 - 150 lux.

Wyatt Guna Center

According to the Regulation of the Minister of Social Affairs No. 3 of 2022, the centre is a technical service unit (UPT) under the auspices of the Ministry of Social Affairs of the Republic of Indonesia and is responsible to the Director General of Social Rehabilitation which is the implementation unit in the field of social rehabilitation. In the

The Concept of Behavior Settings as a Criterion for the Design of Rehabilitation Centers for the Blind in the City of Bandung

city of Bandung, there is the Wyata Guna Center the largest and widest social rehabilitation place for the visually impaired in Indonesia.

The Wyata Guna Center is located on Jalan Pajajaran No. 52, RT 03/RW 06, Cicendo District, Bandung, West Java 40172. Rehabilitation activities at the Wyata Guna Center are as follows:

- a. Physical Guidance (sports)
- b. Mental Guidance (places of worship, consultation rooms)
- c. Social Guidance
- d. Skills Guidance (road training, school, massage training, arts, religion, broadcast training)



Figure 3. Wyatt Guna Center

Sumber: Elva, 2017

Meanwhile, the functions of the buildings in the Wyata Guna Center are as follows:

- a. Office
- b. Auditorium
- c. Library
- d. R. Asesmen
- e. Polyclinic
- f. R. Feeding
- g. Public Kitchen
- h. Mosque
- i. Church
- j. Exceptional School
- k. Fields
- l. R. Data
- m. R. Printing
- n. Shared Trash
- o. Boys and Girls Dormitories



Figure 4. Wyatt Guna Center Research Building

Source: Personal Analysis, 2023

The research will be carried out on three centre buildings, namely:

- a. Boarding house
- b. Printing
- c. Massage Training

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Figure 5

Center for The Blind and Visually Impaired

The precedent taken is the Center for The Blind and Visually Impaired in Mexico. This building was created to provide services in the Iztapalapa region, which is the region with the largest blind population in the State of Mexico.

This building complex consists of building masses. The first mass with linear circulation houses the functions of offices, classrooms, cafeterias, and utility rooms. The second mass is divided into two parts by a linear circulation that functions as a square, containing the functions of shops, galleries, and art classrooms. The third mass contains the functions of the classes. In the western part of the complex, there is a fourth mass that contains the functions of a library, an auditorium, a swimming pool, and a sports field.



Figure 6
Denah Center for The Blind and Visually Impaired

The entire building mass at this rehabilitation centre is in the form of a rectangular prism with concrete structure material. To provide information to the visually impaired, the building uses a variety of sizes and types of materials (concrete, brick, steel, and glass). This building uses natural elements as directions in addition to the guide path, namely the flow of water on the circulation path, and bricks arranged vertically on the walls of the building so that they can be touched by the visually impaired.

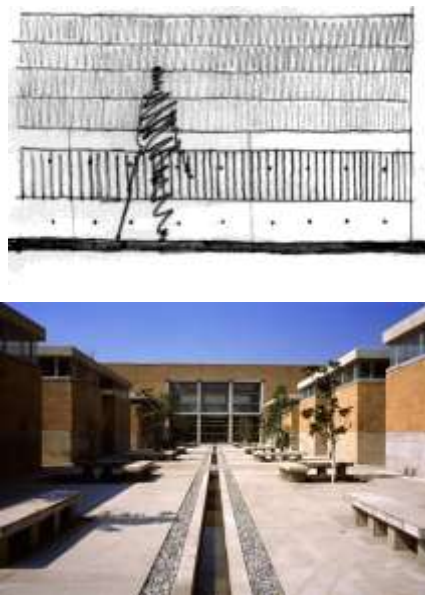


Figure 7
Eksterior Bangunan The Blind and Visually Impaired

Analysis of the Five Criteria of Behavioral Architecture

1. Space Analysis

The dormitory building, massage training place, and printing place at the Wyata Guna Center use 40cm x 40cm ceramics as the floor covering, and 20cm x 40cm ceramics as the wall covering material. This material similarity is not to the needs of the visually impaired to be oriented and mobility. Similar materials will produce similar sounds and textures, which will make it difficult for visually impaired people to get information about

their surroundings and their position. So that a combination of materials is needed on the floor and walls of the building.



**Figure 8. Dormitory Building Materials
Wyata Guna Center (B)**

Furthermore, the central dormitory (B) building has a problem, namely, the repetition of the building column structure in the interior and exterior of the building. This repetition inhibits and endangers blind people in orientation and mobility.



**Figure 9. Building Column Repetition
Wyatt Guna Center**

2. Size and Shape Analysis

The shape of the dormitory building, massage training place, and printing place of the Wyata Guna Center is to the needs of the Visually Impaired, in the shape of a rectangle. Meanwhile, the form of circulation in the area and space in the dormitory of the Wyata Guna Center has also met the needs of the visually impaired because it is linear and the letter "H" so that there is no circulation that crosses and twists.

The Concept of Behavior Settings as a Criterion for the Design of Rehabilitation Centers for the Blind in the City of Bandung



Figure 10. Circulation Place

The size of circulation in the Wyata Guna Center dormitory has followed the provisions made by the Minister of PUPR with a minimum circulation width of 1200cm.

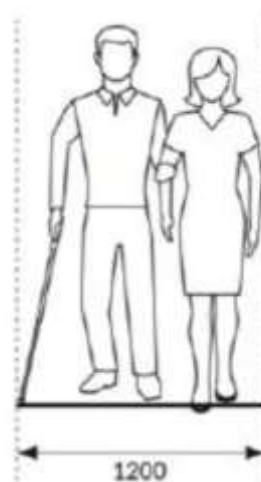




Figure 11
Circulation Width of the Dormitory Room (B)

The problem is in the structural elements of the columns that are angular and protrude from the exterior of the building. This can hurt the visually impaired when orienting and mobility. So it is necessary to have a tubular column structure and not protrude out on the exterior of the building.





**Figure 12. Column Structure
Wyata Guna Center Dormitory (B)**

Architectural elements of doors and windows with openings in dormitories, massage parlours, and central offices can be dangerous for the visually impaired when they are oriented and have mobility. To overcome these problems, the architectural elements of doors and windows have side openings or use sliding doors and windows.



**Figure 13
Central Dormitory Window Opening (B)**

Furniture Analysis

The dormitory, massage place, and office of the Wyata Guna Center are equipped with guide paths in the outer space of the building and some in the indoor space of the building. This guided path serves as a direction for the visually impaired to orient and mobility.



Figure 14. Guide Strip

In addition, the placement of furniture in the space in the building has been placed based on the width of the space needs of the visually impaired so that it does not obstruct or hinder the movement of the visually impaired.



Figure 15
Furniture Installation at the Massage Training Place (C)

Colour Analysis

In the dormitory, massage training place, and Wyata Guna recording place, there is no colour combination in each mass and there is no colour combination between the interior and exterior spaces of the building. The use of the same material in the form of ceramics makes the colour of the building monochrome and does not contrast. This makes

The Concept of Behavior Settings as a Criterion for the Design of Rehabilitation Centers for the Blind in the City of Bandung

it difficult for people with partial blindness to distinguish the function of space and their location in the Wyata Guna Center area.

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Figure 16
Interior and Exterior Colors of the Wyata Guna Center Dormitory (B)

Therefore, a contrasting colour combination is needed in the interior and exterior spaces of the central building. The use of materials that have different colours can also produce contrasting colour combinations.

Sound and Lighting Analysis

The Voting Criteria in the Wyata Guna Center area are good. This can be seen from the many trees in the centre area as a natural sound buffer so that no noise pollution disturbs users when in the Wyata Guna Center area.



Figure 17
Trees as a Natural Buffer in the Central Area

The lighting criteria at the Wyata Guna Center are also good, because each centre building is equipped with an opening in the form of a window to minimize the use of artificial light sources, and the many green open spaces make sunlight easily enter the building space without obstruction.





Figure 18
Openings and Green Open Spaces in the Central Area

Conclusion

The design of the Wyata Guna Center building needs to reconsider the comfort and safety aspects of the Center's visually impaired users. Things that need to be fixed are as follows:

1. Using a combination of different materials in terms of colour, size, and texture for indoor and outdoor spaces
2. The repetition of structural columns in the inner and outer spaces is eliminated
3. Rectangular columns are replaced with circular columns
4. Columns protruding out are removed or levelled against the walls of the building
5. The use of architectural elements of doors and windows that need to be reoriented instead of sliding doors and windows.

Based on the research conducted, the Dormitory, Office building uses a modern local architectural style that is private so that it is specifically for the visually impaired. As for the massage parlour building, it uses a modern local architectural style that is semi-public so that it is not specifically for the visually impaired.

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