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Inclusive Elements at Accessibility in Open Space and At-Taqwa Mosque Universitas Muhammadiyah Semarang

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Abstract. The park at Universitas Muhammadiyah Semarang still does not fully meet the needs of blind people, because it still lacks guiding blocks, as well as the lack of other supporting elements that can hinder their ability to move. Thus, it is necessary to recommend a design solution that can improve access for blind people, especially on the path to the At-Taqwa Mosque. Against this background, this research seeks to design a guiding path for the visually impaired and signage that suits their needs in the green open space leading to the At-Taqwa Mosque. The design will consider the use of guiding blocks and braille signage as direction and information guides. An inclusive design plan is implemented so that all users, including people with other disabilities and the general public, can benefit optimally. The solutions proposed in this research, such as the addition of guiding blocks for navigation and a Braille signage as inclusive information, are designated based on universal design principles in Unimus' green open space. The implementation of this solution not only supports the needs of the visually impaired but also creates an inclusive, comfortable, and accesible green open space for all campus users.

Keywords: inclusive elements; accessibility; open space; at-taqwa mosque; unimus

1. Introduction

Accessibility in Universitas Muhammadiyah Semarang (Unimus) is an important aspect that must be considered to create an inclusive environment for all academicians and the public, including people with disabilities. Universitas Muhammadiyah Semarang has green open spaces and public places that can be accessed by the entire public. Green open spaces such as Unimus Gazebo Park located at the front after the entrance gate of Unimus and the Healing Garden located at the right side of the one-way entrance road of Unimus. The At-Taqwa Mosque of PWM Central Java is the public place for worship at Universitas Muhammadiyah Semarang.

Figure 1. At-Taqwa Mosque PWM Central Java Unimus Area
(Source: Author, 2025)

These public places are commonly used by various community groups, including students, lecturers, campus employees, and the general public who visit to worship or simply enjoy green open spaces [1]. However, the existing facilities have not fully considered the needs of certain groups, especially blind people [2].

Figure 2. The Entrance of Gazebo Park Unimus
(Source: Author, 2025)

The park at Universitas Muhammadiyah Semarang still does not fully meet the needs of blind people, because it still lacks guiding blocks, as well as the lack of other supporting elements that can hinder their ability to move [3]. Thus, it is necessary to recommend a design solution that can improve access for blind people, especially on the path to the At-Taqwa Mosque.

Against this background, this research seeks to design a guiding path for the visually impaired and signage that suits their needs in the green open space leading to the At-Taqwa Mosque. The design will consider the use of guiding blocks and braille signage as direction and information guides [4]. An inclusive design plan is implemented so that all users, including people with other disabilities and the general public, can benefit optimally [5].

The universal design approach can be a solution in designing facilities that are not only friendly for the blind but also for all campus users [6]. Some of the principles applied in universal design include the use of guiding blocks that are not only beneficial for the blind but also provide orientation for all pedestrians, good lighting to increase visibility, and signage that includes text, and braille to facilitate information accessibility [7].

1.1. Guiding Block

Guiding Block is one of the accessibility tools in the form of textured tiles, specially designed to help people with disabilities, especially those with visual impairments or blindness. This tile serves as a guide for users to move more safely [8]. Guiding Blocks are often found in various locations and public facilities, such as city parks, stations, and other public places [4].

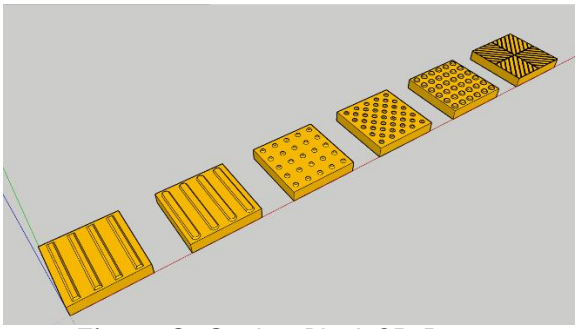


Figure 3. Guiding Block 3D Design
(Source: Sketchup)

In accordance with the Peraturan Menteri Pekerjaan Umum Number 30 Year 2006 on Technical Guidelines for Facilities and Accessibility in Buildings and the Environment. Technical and accessibility requirements:

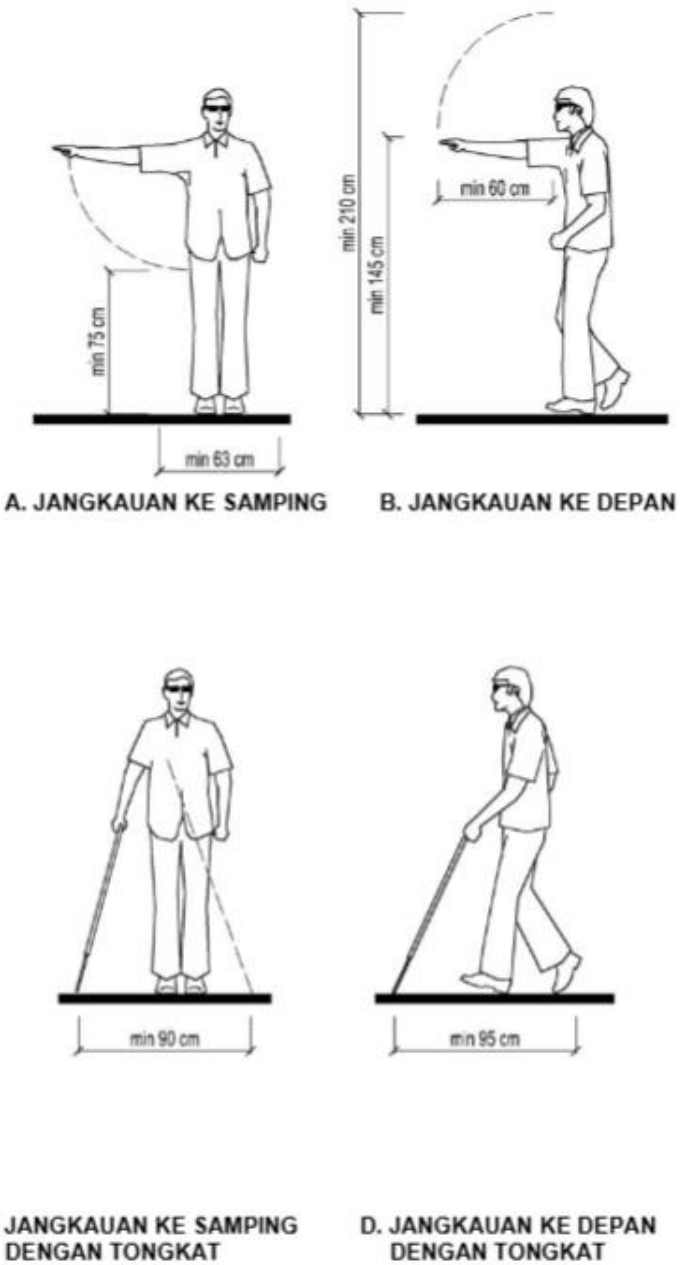


Figure 4. Behavior of the Visually Impaired
(Source: PerMen PU No 30 Year 2006)

1.2. Behavior of the Visually Impaired

The visually impaired often wiggle their bodies with the help of a stick that is swung left and right to avoid collisions with objects in front of them [9]. This behavior requires them to need more space compared to sighted people. In addition, the stick is also usually slightly bumped against the floor surface. Blind people will maximize the use of other senses besides

vision. They are able to feel the echo produced on the floor surface, and the difference in floor materials that can make it easier for blind people to mark a space [9].

a. Principles of guideway implementation
   1) Areas where guiding blocks texture tiles should be used:
      i. In front of vehicular traffic lanes;
      ii. In front of entrances/exits to and from staircases or crossing facilities with different floor heights;
      iii. At the entrance/exit of a public transportation terminal or passenger area;
      iv. On pedestrian walkways connecting roads and buildings;
      v. On directions from public facilities to the nearest public transportation station [8].

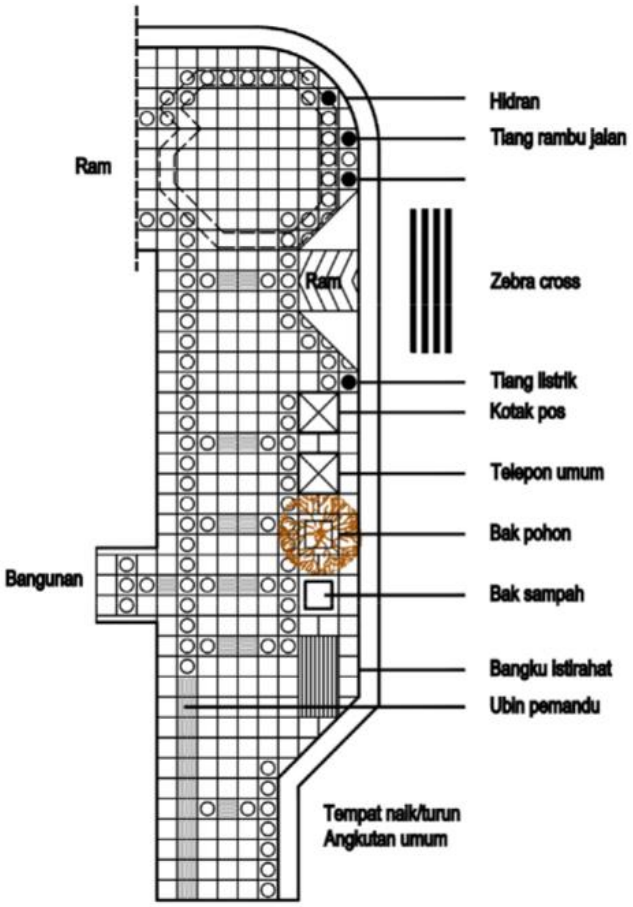


Figure 5. Implementation of standards
(Source: PerMen PU No 30 Year 2006)

   2) The installation of texture tiles for guiding paths on existing pedestrians needs to pay attention to the texture of the existing tiles, so that there is no confusion in distinguishing the texture of the guiding tiles and the texture of the warning tiles. 2) The installation of texture tiles for the guideway on the existing pedestrian path needs to take into account the texture of the existing tiles, so that there is no confusion in distinguishing the texture of the directional tiles and the texture of the warning tiles [10].
   3) To provide a color difference between the guide tiles and the other tiles, the guide tiles can be colored yellow or orange [4].

1.3. Braille Signage

Braille is a writing system consisting of six raised dots. Combinations of these dots can form letters, numbers, and punctuation marks. Braille reading is done from left to right, while writing is done from right to left. Thus, the braille structure has two aspects: positive for reading and negative for writing [10].

Thus, this research will contribute to creating a more disability-friendly Universitas Muhammadiyah Semarang that reflects the values of inclusivity in higher education.

2. Methods

This research uses a descriptive-qualitative approach with stages including literature study, field observation, and design simulation. Literature study was conducted to collect references on universal design and blind accessibility from academic journals. Observations were made at Unimus' green open space to identify existing conditions, such as the availability of guiding blocks, and braille signage for Park to Mosque connectivity. Based on the results of the literature study and observations, design simulations were conducted using software such as AutoCAD or SketchUp to produce inclusive solutions such as guiding blocks, and braille signage.

3. Results and Discussion

Based on observations, the campus park does not have adequate accessibility. In addition, the contours of the land in the park are also uneven, making navigation difficult for people with disabilities. Existing documentation of the open space around the campus park towards At-Taqwa Mosque shows that although this area has a fairly large green space. The existing path has not been equipped with guiding blocks, making it difficult for the visually impaired to determine the direction and location they want to go [11]. In addition, the available signage is only a visual information board without any braille elements, which makes it inaccessible to visually impaired people [12]. Some pedestrian paths also have uneven surfaces, suggesting that the current design still does not optimally accommodate the principles of inclusivity and accessibility.

Figure 6. Unimus Healing Garden Path
(Source: Author, 2025)

Figure 7. Open Space Connectivity to Unimus At-Taqwa Mosque
(Source: Author, 2025)

The connection between the park and the mosque is not equipped with accessibility facilities.

1. Needs of the Visually Impaired in Unimus' Green Open Space Environment
   Based on literature studies, blind people need several main elements to be able to navigate in open spaces safely and independently [2]. These elements include guiding blocks that serve as navigation guides, and Braille signage to provide directional or location information in an accessible format [13].

2. Guide path texture type requirements according to Peraturan Menteri Pekerjaan Umum No. 30 Year 2006:

   a. Striped patterned directional tile texture shows the direction of travel.

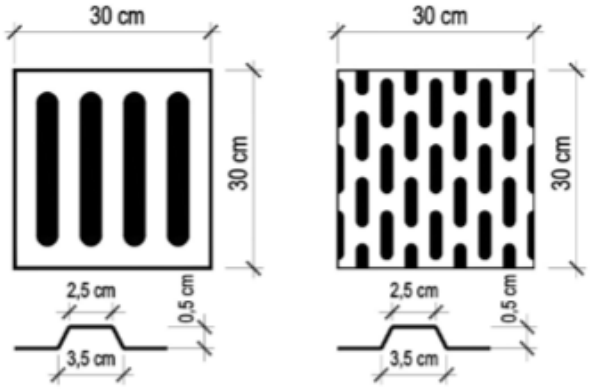


Figure 8. Guiding Block Stripe Motif
(Source: PerMen PU No 30 Year 2006)

b. The texture of warning tiles (rounded) alerts to changes in the surrounding situation/warning.

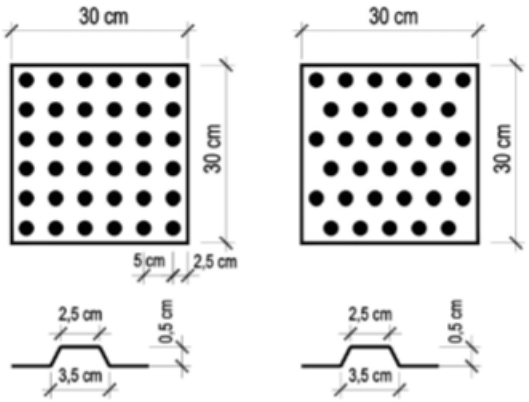


Figure 9. Guiding Block Round Motif
(Source: PerMen PU No 30 Year 2006)

c. Arrangement of guide tiles at the turn.

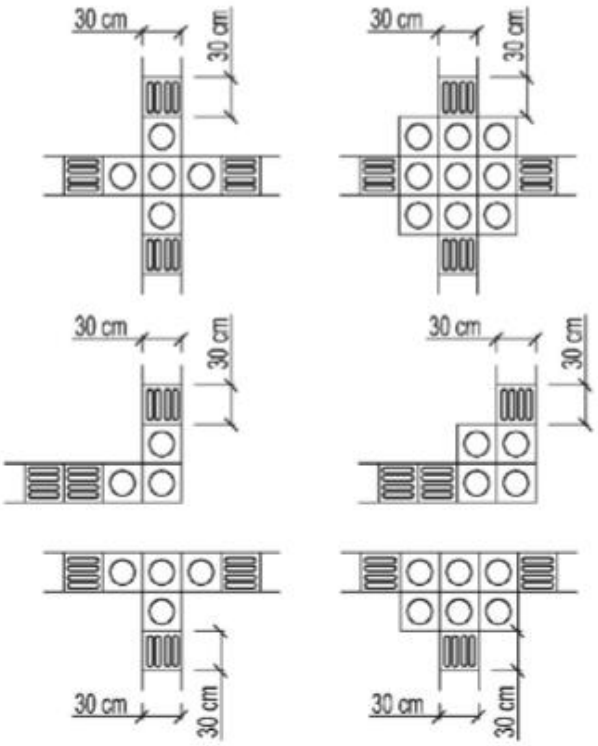


Figure 10. Tile Arrangement at the Turn
(Source: PerMen PU No 30 Year 2006)

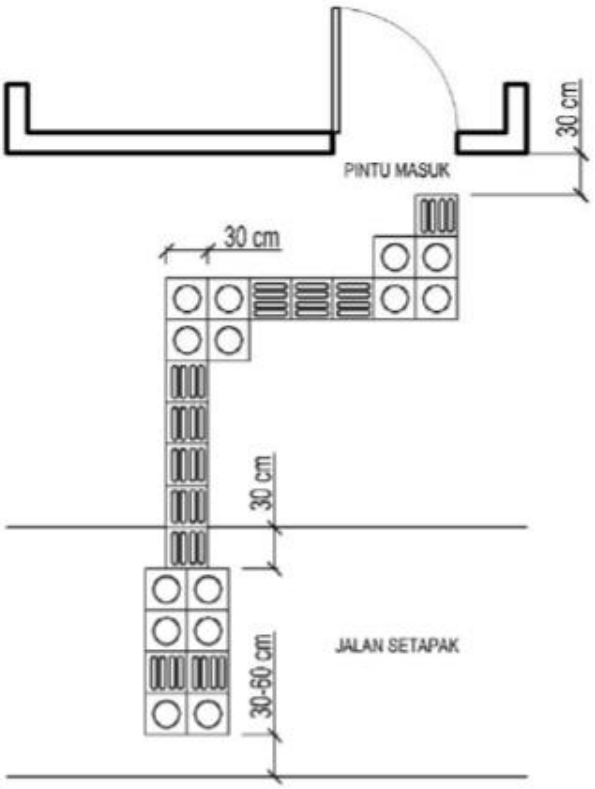


Figure 11. Tile Arrangement at Entrance/Exit
(Source: PerMen PU No 30 Year 2006)

d. Design Recommendations for the Addition of Guiding Blocks and Signage

The area of RTH Unimus is 6,381 m². On the south side is the Unimus Gazebo Park area which only contains ornamental plants, shady trees, and several gazebos. On the north side is the Healing Garden Unimus which contains more elements of ornamental plants, fountains, and paths of split stone, but no shady trees [14].

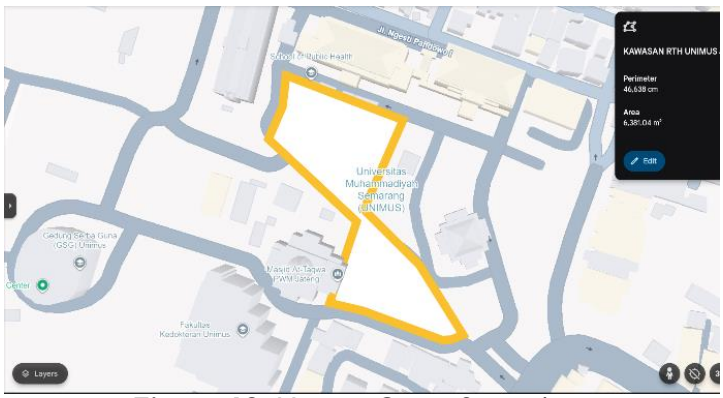
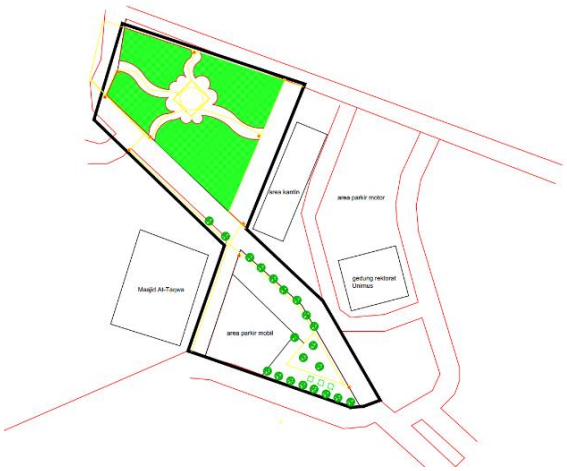


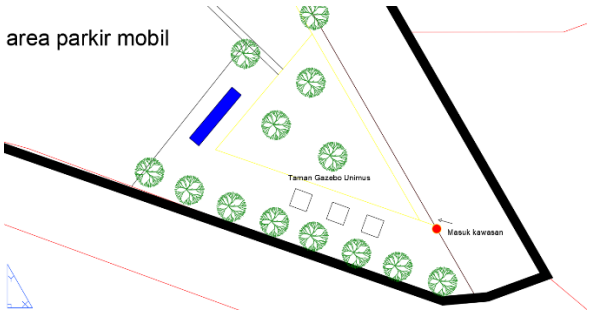
Figure 12. Unimus Green Space Area



Description Figure 13	
Yellow Line	: Guiding Block
Red Line	: Main Road
Black Line	: Area
Red Circle	: Braille Signage
Green	: Vegetation

Figure 13. Plan for the Addition of Guiding Blocks and Braille Signage

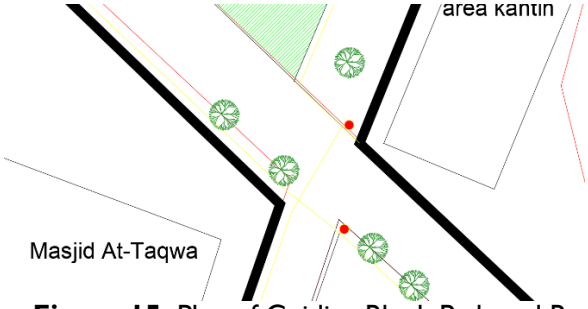
Based on the findings and analysis, these design recommendations aim to create a more welcoming and inclusive environment for all users, especially the visually impaired. These design recommendations are made by considering the mobility and navigation needs of the visually impaired so that they can move independently safely and comfortably.



Description Figure 14	
Yellow Line	: Guiding Block
Red Line	: Main Road
Black Line	: Area
Red Circle	: Braille Signage
Green	: Vegetation
Blue	: Water

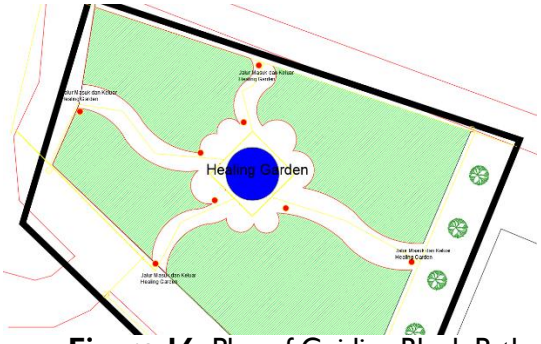
Figure 14. Plan of Guiding Block Pathway and Braille Signage of Unimus Gazebo Park

Entering the green open space area of Unimus Gazebo Park, visitors will find two main paths that can be traveled. The path that leads to the south will bring visitors to the gazebo area, which serves as a place to relax and gather. Meanwhile, the path that leads to the north allows visitors to go directly to the mosque or Healing Garden, an area designed to provide comfort and tranquility for visitors.



Description Figure 15	
Yellow Line	: Guiding Block
Red Line	: Main Road
Black Line	: Area
Red Circle	: Braille Signage
Green	: Vegetation

Figure 15. Plan of Guiding Block Path and Braille Signage of Open Space Connection to Majid At-Taqwa Unimus



Description Figure 16	
Yellow Line	: Guiding Block
Red Line	: Main Road
Black Line	: Area
Red Circle	: Braille Signage
Green	: Vegetation
Blue	: Water

Figure 16. Plan of Guiding Block Path and Braille Signage Healing Garden Unimus

For the Unimus Healing Garden area, there are 4 (four) paths through a curved path, but the guiding block path only follows the slope. It is not made bumpy so that visually impaired visitors do not have difficulties.

4. Conclusion

This research shows that the current campus park has not met the accessibility needs of people with disabilities, especially the visually impaired. The absence of guiding blocks, Braille signage, and ramps in the park and the connection to the mosque are the main obstacles for them to navigate independently. However, the presence of a ramp inside the mosque provides potential for further accessibility development.

The solutions proposed in this research, such as the addition of guiding blocks for navigation and Braille signage as inclusive information, are designed based on universal design principles in Unimus' green open space [15]. The implementation of this solution not only supports the needs of the visually impaired but also creates an inclusive, comfortable, and accessible green open space for all campus users.

With the integration of these facilities, the campus park is expected to become a friendly space for people with disabilities, while improving the quality of public spaces as part of an inclusive education environment.

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