DESIGNING FOR THE BLIND: MULTISENSORY DESIGN APPROACH FOR CITY'S PARK

Nouvend Setiawan*, Fadhil Faried Putra*, Datin Intan Baktara*, Zuhrotul M. Ula*, Arina Hayati**, Kirami Bararatin**, Fardilla Rizqiyah**, Collinthia Erwindi**
*) Fresh Graduate Student, Department of Architecture, Institut Teknologi Sepuluh Nopember (ITS), Indonesia
**) Department of Architecture, Institut Teknologi Sepuluh Nopember (ITS), Indonesia
e-mail: arina_h@arch.its.ac.id

ABSTRACT

A city is said to be accessible if its implementation accommodates users' needs, including those with special needs, either disabled, elderly, children, etc. The environment is considered accessible if it ensures users' equality, equity, and living without a hitch. Surabaya, a city with great appreciation and recognition, known to be one of the best cities in the world, is still yet not to be entitled as an accessible city, despite all the greatness of the town, which improve the people living in it. Like most cities in Indonesia, Surabaya is built mainly normative oriented to buildings and urban infrastructures and facilities, not human-oriented approach. Some failures in urban design implementation are common, for instance: tree roots and their placement are still interfering pedestrians on the sidewalk; most signage is still not informative enough for people with special needs in streets and public facilities; guiding blocks for blind people are far from decent to be safely and comfortably used in a daily basis; parks pay no attention to their accessibility; etc. This paper offers an idea about how to live as a blind person in Indonesia and how the experience is considered the primary part of a design process. The idea is generated to propose the design criteria for redesigning a public park. The data is gathered through participant observation by referencing from a blind's point of view. Taman Bungkul is chosen as a field study as it is one of the best and the oldest parks in Surabaya and has been recognized and actively used by the residents. The proposed idea is formed by directly experiencing and observing what it feels like to be blind amidst public facilities designed for the non-disabled. The design criteria weigh how blinds gather information, percept spaces and distances, and use their senses such as aural, olfactory, tactile, and other senses. The result proposes design criteria for existing public facilities that are more accessible, visitable, comfortable, and inclusive for everyone, especially for the blind. The design is presented and graphically communicated.

Keywords: Sensory design, Blind, Public Facilities, User's Experience.

INTRODUCTION

In the architectural design process, the designer is obligated to create a built environment or building that accommodate people's needs and wants. Designing in architecture is a shared cognitive process where the user and designer communicate with each other, exchanging knowledge and experience (Hofmann, 2014). In this process, the user tells stories of their needs and wants to be later translated so that they can be applied to a formal design. A city park is a public facility serving as the heart of a city and as a society's outdoor activities area. This calls for accessibility given that public facility is open to a wide variety of users, namely children, the elderly, women, and the disabled; thus, they must be accessible and accommodate everyone equally**.** However, Indonesia's public facilities are not excellent for those with disabilities, given that there are plenty of inaccessible facilities in Indonesia. Inclusivity in a public facility is not seen as an urgency because disabled people are minorities by number. It is the needs of the majority that should be prioritized first. In some big cities, the government has already tried their best to provide some elements for disabled people, but unfortunately, these are mere standards. Some of those elements are confusing and even dangerous for disabled people. The minimum education of inclusive design needs leads to careless application.

This paper aims to explain a city park's design process proposal with a participatory based inclusive design approach, focusing on blind people. This process consists of three steps; the first step was conducting a little research with the participants (blind people) to reveal their needs and wants; the second step was abstracting the result from the participants, translating it into design criteria and manifesting it into formal design aspects; and the last step was proposing the final design as a response to participants' problems and hopes regarding how a city park should be.

THEORY / RESEARCH METHODS

Theory

The barrier is any obstacles that prevent people from fully participating in all aspects of society and their ability to move independently (Steinfeld & Maisel, 2012). These barriers are either visible or invisible. When experiencing places, people may find difficulties when encountering obstacles. Not only walls, but certain aspects may also affect people on how they experience sites, take age for example. Children see and remember the environment differently from adults (Creating a Sense of Adventure, 2009). Therefore, specific wayfinding, such as landmarks, is an effective navigational technique for children, which are also helpful for adults and the elderly. Thus, accessibility has different meanings depending on the context of the term.

An accessible building used within Inclusive Design (ID) refers to having the right and freedom to use and enjoy the facilities, employment, and communication like any other user (Nussbaumer, 2012). ID is always accessible, and Accessible Design (AD) is accessible but not always inclusive. I provide situational awareness and express circulatory functions to create spatial awareness for all users. It is more effective than inclusive built forms are not determined using historic ornamentation and aesthetic appeal. The approach should be similar to 'form follows function' since inclusive building serves a purpose to accommodate diverse needs (Wong, 2014).

According to Smith and Hancock (1995) in Steinfeld & Maisel (2012), people's cognitive minds do not search for knowledge. Instead, they use perception and understanding of their environment using previous experiences of the said environment. According to Roth (1993), there are four types of functions in architecture: pragmatic, circulatory, symbolic, and psychological. Inclusive buildings should convey psychological function and circulatory function, which covers how an environment could provide appropriate spaces to accommodate direct movement from one area to the next.

Wayfinding is another form of communication system integrated within an inclusively designed building for people to find their destination. People with diverse abilities tend to avoid unpredictable environments, making wayfinding effective to accommodate diverse needs. According to Salma (2007) in Nussbaumer (2012), wayfinding is described as various methods people use to navigate to become familiar with their surroundings. Some people read, some listen to sounds; some use light or colour for orientation, some touch, and others may prefer to combine a few of these wayfinding techniques. Wayfinding can be done easier when there is signage since signage acts as a medium between architecture (the sender of information) and users (the receiver) (Schittich, 2013). It uses both visual and non-visual communication in space, benefiting a diverse group of people. According to Lefton and Brannos (2002) in Steinfeld & Maisel (2012), 70% of our sensory information comes from vision. However, when sight is not available for vision loss or low vision, people depend on other senses for additional information through sound, touch, smell, and taste. The density of nerves in the human body is found at the fingertips and lips in the medical field. Thus environmental information for the blind is mainly obtained through this sense of touch (Kopec, 2018). A discussion on this other sensory outside from sight is essential when designing inclusively so that people with diverse abilities can orient themselves quickly.

Methodology

The method used for the observation method is Atmospheres Method Modules and User's Everyday Life Method Modules, developed by Hofmann (2014). This method was applied by going to City Park (in this case, *Taman Bungkul*) for about half-day, bringing tutors, students, and participants with special needs such as the disabled, blind, deaf, elderly, and children together. Participants were observed to raise the designer's awareness and reach a common understanding by recording and following the participant's detailed daily life. The design method used was to align the physical/non-physical aspects of the blind participant's wants and needs as fitting as

possible to be responded to in a city park design proposal. However, in this discussion, only the perception and response from the blind were used as the base of designing a city park.

Figure 1. Trip route map, from A to F (personal illustration)
Source: Safikhani,2013

The authors observed one participant get a deep understanding from the participant's perspective during the trip. The subject watched intensely was Widi

(anonymized name), a senior blind woman. Broad lost her eyesight in her teens and has been living with it despite her struggles. Widi's eyesight deteriorated over time, affecting her lifestyle and well-being. When she first lost her eyesight completely, she had to be assisted in nearly everything she did. She also dealt with an unstable mental state until she realized that she had to change her lifestyle to ultimately cope with her new condition. Over time, she gained composure and strived to learn to do things alone. Mistakes were made, but Widi learnt her lessons. Widi is now good at handling the environment around her, although sometimes things do not go her way, and she can still bump into stuff. Given that Widi was not blind at birth, she still has some memories of things in this world to help her better perceive the environment around her. She relies on her existing memories, combining them with new information gained from her strengthened sensory abilities (hearing, smelling, and other cognitive functions) to prevail in her daily life.

Figure 2. Widi when experiencing the environment around her. Objects highlighted with red are barriers, and objects highlighted with green are signage (personal documentation)
Source: Safikhani,2013

The trip started in the morning. All participants gathered to have breakfast before advancing to the first stop. The road to the first stop (bus stop) was taken by foot to find out how accessible the city is for people with special needs, especially blind people. During breakfast, Widi showed the authors how she usually eats her foods. She first identifies the foods she is having by asking people; then, she memorizes them and their positions by touch (using cutlery). She also managed to tell people's positions based on the volume of their voice in the restaurant. After breakfast, the trip proceeded to the first stop. On the way, Widi told the authors her opinions of the environment around her. A lot of things happened during the time of which the trip proceeded until it finally arrived at the last stop, *Taman Bungkul,* such as Widi constantly telling the authors how a city should be, how scarce were signage along the way, and how she is accustomed in taking public transportation by herself. The authors also observed how society reacted when Widi took public transit. People are still unaware that priority seats should be given to those in need.

After arriving at the city park, the authors accompanied Widi to walk around the park and ask Widi how she thinks of the park regarding accessibility for the blind.

Figure 3. Wide at the start of the trip during breakfast (left) and Widi exploring Taman Bungkul (right) (personal documentation)
Source: Safikhani,2013

RESULTS AND DISCUSSION

Experiencing Environment with the Blind: An Ordinary Journey to City's Park

Widi found it challenging to find entrances from where she got off the public transportation during arrival at the city park. Widi took a shortcut by 'jumping' off a sewer to the nearest pedestrian. If Widi were alone, she would be troubled to find the entrance by herself. Inside the park, there was no tactile paving. Therefore Widi had to rely on the authors to walk comfortably. The vast, open area of the park also made Widi quite troubled in locating her surroundings. Widi also told the authors how she felt that the park was "less of a park" because it lacks greeneries such as bushes or aromatic plants.

Not only did the authors observe Widi, but one of the authors also posed to be blind. One of the authors, Intan, tried to experience the trip as if she was blind, using a blindfold and white cane. After the trip, the authors asked both Widi and Intan various questions, and the result differs, entirely as expected since Intan is not blind at the beginning. For Widi, a park is identical to flowers' scents, while Intan described the park as somewhere more tranquil than a city. When asked about space and form of a city/park's elements, Intan answered that the city/park's components formed according to 'memories' that existed in the said place. Wide approached the question differently, saying that the city/park lacked accessible elements for visually impaired people. The difference of coming to the question is visible because Intan was posing to be blind, compared to Widi, who are living the very life of the blind. When asked about how time affects their perceiving the environment, Widi stated that as soon as the sun sets, she should go home because there will be less light intensity, and she couldn't navigate as well as when the sun is still up. Intan stated that the change of temperature was her primary time navigation tool. When asked about comfort and privacy, Widi answered that a familiar environment is the most

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comfortable. She also added that a two-meter radius is a comfortable distance between her and the people around her.

On the other hand, Intan stated that as soon as her eyesight was temporarily taken away, her sense of privacy and comfort depleted. She then explained that the importance of privacy and comfort could be regained when she started to learn and know about the environment she was in. But even with the differences, they still come to a common ground of understanding that a supportive environment for the blind is helping them to do their activities and lift their mood.

Figure 4. Difference between how Widi and Intan experience the surroundings.
Source: Safikhani,2013

The most significant difference in how Widi and Intan experience their environment is how Intan needed assistance much more than Widi. One of the examples is shown in the figure above, where Widi's assistant (a guy in blue) is only observing Widi while Intan's assistant is assisting her most of the time. This happens throughout the trip. Widi is very familiar with how she has to find her way, thus making her assistant do a minor job while Intan, given that she never had an experience of blindness, has to be assisted most of the time.

As a blind person, Widi is has a strong memory and is very organized. Because of this systematic nature, Widi will find it hard if her surroundings are changed without prior notice. When this happens, Widi's cognitive process will face an interruption that causes blanking in her mind. This has happened before, interfering with the navigation process even in a familiar environment.

Psychologically, sometimes people think that people with disabilities should always be assisted, which sometimes actually makes persons with disabilities feel uncomfortable. As stated by Boys (2014), disabled people are often subject to taken-for-granted assumptions that think they are: in need of the help of others, passive consumers of services, constitute a minority of individuals in society who (unfortunately) must bear the brunt of their medical problems.

Presenting assistive elements for the blind does not require excessive installation where more than one pointing element is installed. For example, if the path is already equipped with a handrail, the guiding block is no longer needed. Knowing the functional relationship between elements will avoid useless overdevelopment.

Design Criteria

Designing for the blind should consider the following points:

a. Those with impaired vision will rely on their memories in a challenging place. To resolve that, rooms should not be made into a "labyrinth". Rooms also should be made perpendicular and not into a circle because it will disorient the user. Walls also help the vision-impaired user navigate; it is not always tactile paving that allows them.
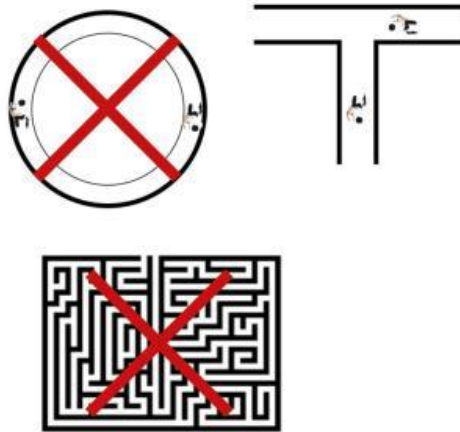
Figure 5. Illustration of design criteria (personal representative)
Source: Safikhani,2013

b. Floor materials should give acoustic "feedback" when the white cane touches the floor. To achieve this, knowledge of materials (besides relying on the texture) are needed.

Figure 6. Illustration of design criteria (personal representative)
Source: Safikhani,2013

c. Signage should be clear, as in a contrast tactile representation, a contrast colour (for those with low vision).

Figure 7. Illustration of design criteria (personal representative)
Source: Safikhani,2013

d. Avoid the existence of flexible space or furniture made to be moved around.

Figure 8. Illustration of design criteria (personal representative)
Source: Safikhani,2013

e. The placement of certain things that gives off a specific aroma can be used as information for a direction guide or a place marker.

Figure 9. Illustration of design criteria (personal representative)
Source: Safikhani,2013

Design Concept

Following the criteria mentioned above, a design solution is proposed. The solution proposed is not a total redesign of the whole park. Instead, it is focused on the theatre and its surroundings. It does not take a luxurious and 'big' chance to create an inclusive public park. The solution is based on the participatory design process result, meaning it's an immediate solution from the blind's perspective.
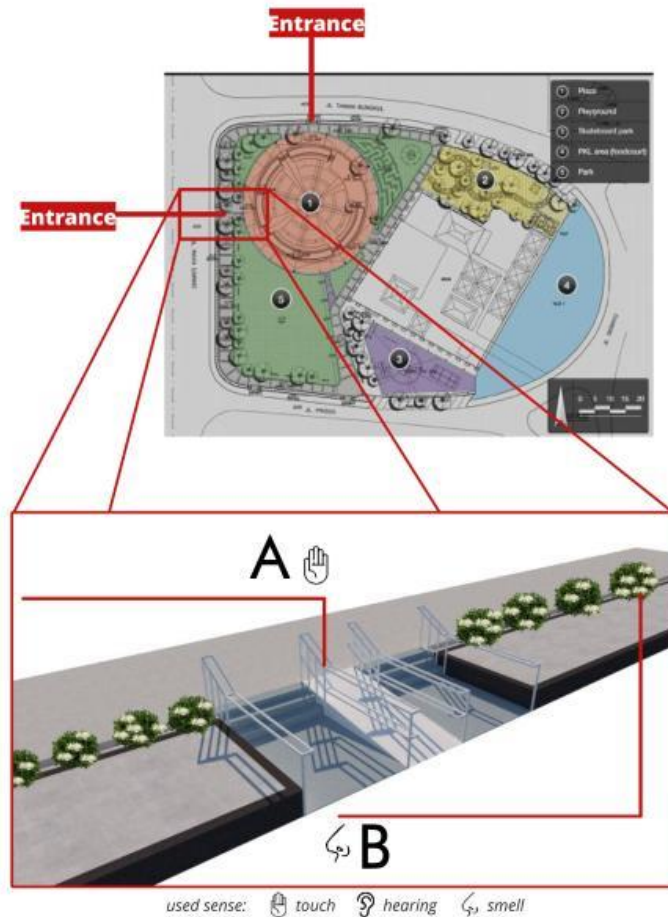
Figure 10. Design solution (personal illustration)
Source: Safikhani,2013

Point A in the figure shows a more visible entrance with a combination of ramps and stairs to help accommodate all users. The presence of railings also helps in achieving that goal. Point B shows how aromatic greeneries is used as signage of the entrance.

Point C shows that after users enter the park, they will be faced with the segmentation of the theatre's floor material. This would help the blind circulate the park more efficiently by creating a path towards the centre of the arena from the different materials. The materials used also consider other users such as wheelchair users (thus the smooth pathway around the hall instead of complete segmentation of different rough materials)
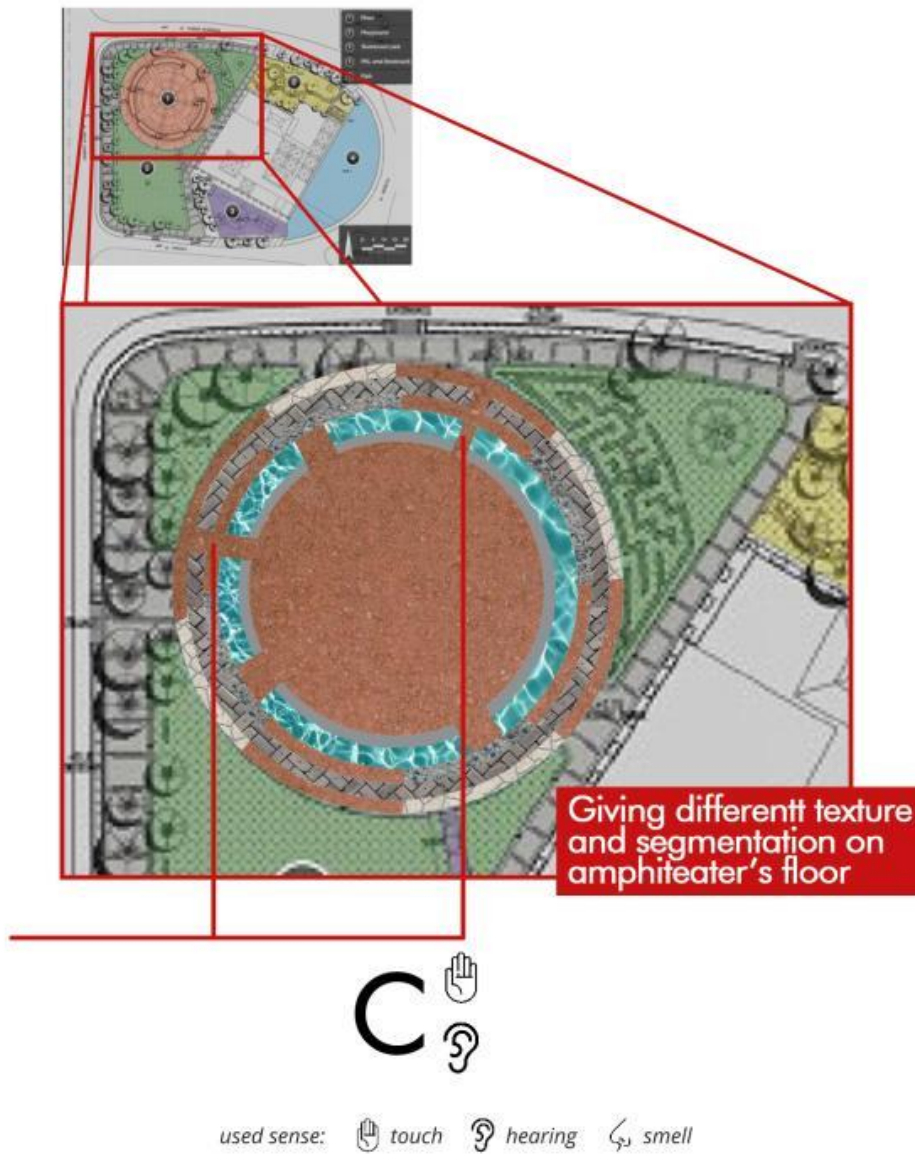
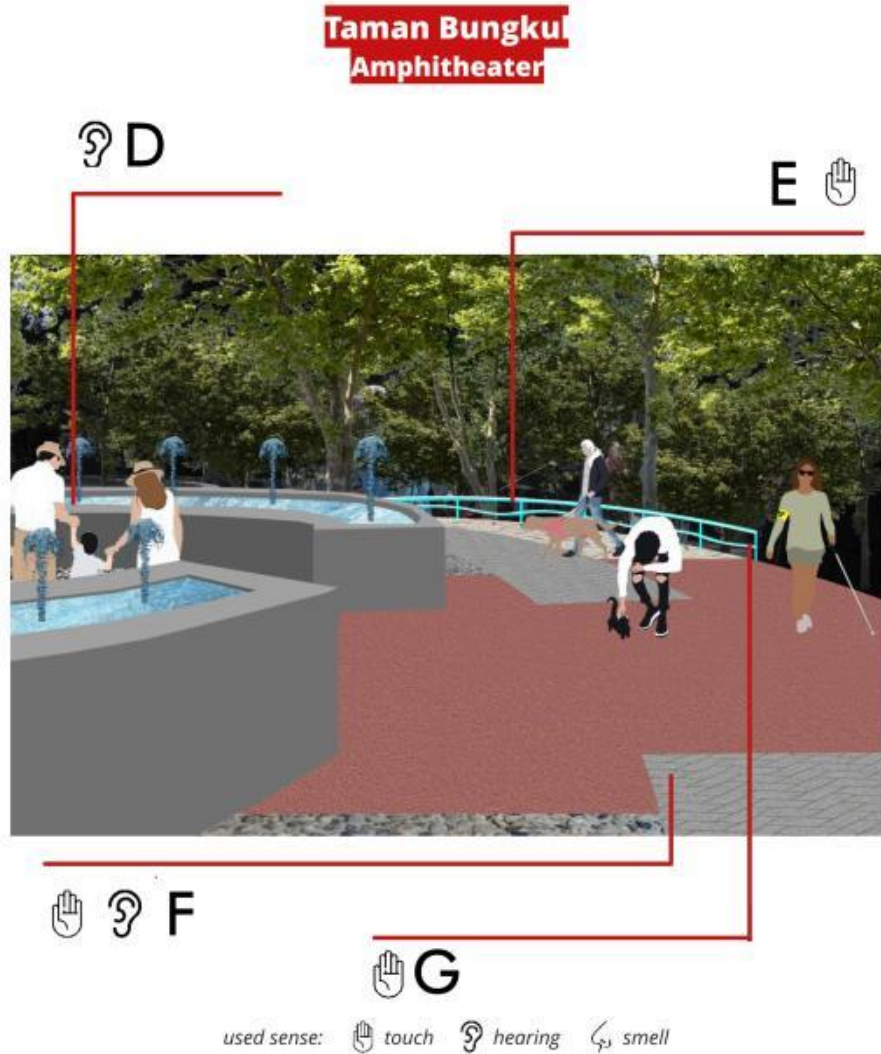**Figure 11.** Design solution (personal illustration)
Source: Safikhani,2013

Figure 12. The design solution, perspective view of the arena (personal illustration)
Source: Safikhani,2013

Point D shows the usage of water fountains as signage that utilizes sound to indicate the centre of the arena. Point E offers guiding blocks and railings for the blind. Point F shows the segmentation of floor materials to ease the blind's measuring distance within the arena. As mentioned before, this segmentation does not fully loop following the theatre's geometry to consider other users, for example, disabled users (rough floor texture will serve as a barrier for the disabled). Point G shows the height variation of railings to entertain kids.
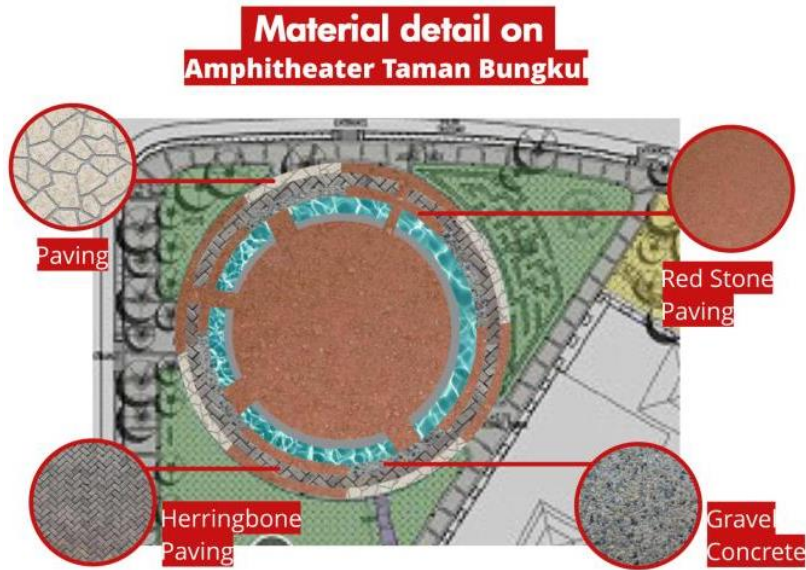
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Figure 13. Material detail (personal illustration)
Source: Safikhani,2013

The material changes gradually depending on how close it is to the centre of the arena, starting from smooth material up until the rough one. Red stone paving is used as a neutral pathway for other users.
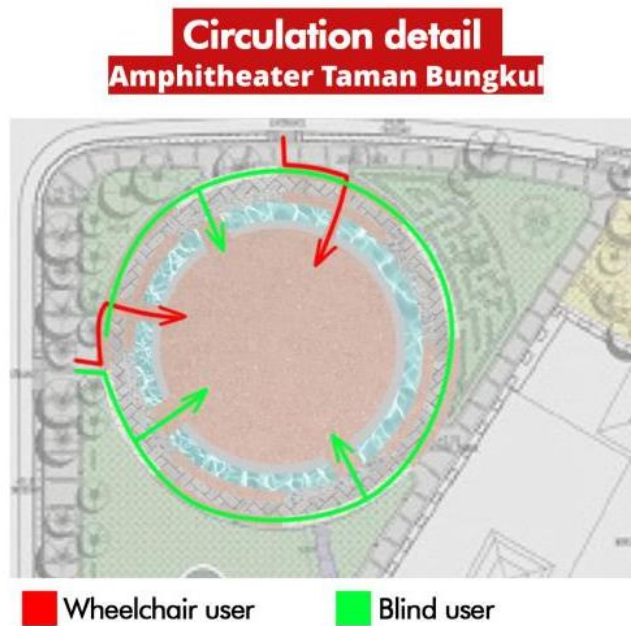

Figure 14. Circulation path on amphitheatre (personal illustration)
Source: Safikhani,2013

CONCLUSION

In designing a city park for people with special needs, the designer needs to take part in communicating with the user. The designer should share as in they should experience the environment-related of whatever they are designing with the user. Participatory based experiences will change the designer's mindset and point of view. Designers should put the user first to have their thoughts collected, their stories about the world from their glasses, and their concerns about things the designer is designing. Thus, by participating the user in experiencing the environment, designers can better point out design criteria to prioritize the user's concern.

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