The universal design approach on sport center in Jakarta to create livable public facilities

N Nurdiani¹, W Katarina¹, I Grestio¹

¹ Architecture Department, Faculty of Engineering, Bina Nusantara University, Jakarta, Indonesia 11480

Corresponding author’s e-mail: nnurdiani@binus.edu

Abstract. The DKI Jakarta Government is actively implementing a sports center rehabilitation program for sports and arts activities for the community. One problem that has not been considered in the design of sports centers in Jakarta is the provision of facilities for persons with disabilities, in order that they have the same opportunities as other normal people in using sports centers. From the results of a study using descriptive methods through observation of existing sports centers, the results are obtained that to realize a livable public facilities requires the design of a sports center that applies the principles of Universal Design, namely Equitable Use, Flexibility in Use, Perceptible Information, Simple & Intuitive, Tolerance for Error, Low Physical Effort, Size and Space for Approach Use.

Keywords: disabilities, sport center, universal design

1. Introduction

The issue of sustainable development is also discussed in the UN Habitat Chapter IV agenda where in the discussion there is the topic of social development. Social development talks about improving the welfare of every individual in the community so they can reach their full potential [1]. Social development also means that all citizens can reach their dreams independently with high confidence [2].

Sports center as one of the public facilities is a building that is expected to support the community in realizing their dreams in the field of sports, or facilities used by the community to exercise in order to maintain and improve their fitness, so that they are always healthy. Public facilities that are suitable for use by all people, including those with disabilities, become demands for the provision of current and future buildings that support sustainable architectural design.

The Government of Indonesia has issued Law No. 8 of 2016 which regulates the fulfillment of disability rights in terms of economic, political, social and cultural access. But access to public facilities that are friendly for the disabled is still inadequate and optimal. The limited facilities, infrastructure, and human resources for the needs of disabled increase the disability gap to be able to interact and participate in society and meet their needs.

Currently, the supply and condition of sports center buildings in Jakarta have not all met universal design standards. So that the sports center buildings need to be rehabilitated by applying universal design principles in their designs. The sports center building becomes a space that also functions socially. Social interaction between building users is expected to create social integration in which people can respect each other's racial and physical, cultural and behavioral differences in their daily
lives, filling each other's needs. Thus, social engagement and unity among community members can be maintained well [3, 4, 5].

Sports and youth facilities owned by the DKI Jakarta Provincial Government are generally old. That's because most of the sports facilities were built in the 1970s. Therefore, the Jakarta Governor rehabilitated a total of 44 district youth centers throughout the Jakarta area. It is planned that the total rehabilitation will be carried out in stages. The use of youth centers at the sub-district level will focus on arts, culture, sports and scientific exhibitions, which can also be used by people with disabilities. This youth arena is used for the activities of youth and youth, as well as residents at the sub-district level to channel their talents through positive activities. In 2018 there will be a number of youth centers that will be rehabilitated. This study will study the conditions of the youth arena in the Jakarta area which will then be chosen as the first priority to be built into a sports center that applies universal design principles in the design of the building.

2. Methodology

The study of the universal design approach on sport center in Jakarta to create livable public facilities was conducted using descriptive method.

Collecting data was done through literature studies on universal design concept; sport center design standards including precedents from similar projects, and field observations after choose the sport center to be built. The analysis is carried out by observing the user aspects, the environmental aspects, and the building aspect.

3. Result and Discussion

The results of a comparison of several youth centers in Jakarta through an analysis of the advantages and disadvantages of building conditions in terms of several aspects, and can be seen in table 1.

Table 1. Analysis of building conditions related to sports center rehabilitation.

| No. | Sport Center       | Availability of disabled facilities | Easy to Public Transportation | Visual Potential | Emergency Access Availability |
|-----|--------------------|-------------------------------------|--------------------------------|-----------------|-------------------------------|
| 1.  | Sport Center Tebet | -                                   | +                              | +               | +                             |
| 2.  | Sport Center Duren Sawit | -                               | +                              | -               | +                             |
| 3.  | Sport Center Cilincing | -                                | +                              | -               | +                             |

The results of the analysis above indicate that there is a sports center building chosen to be prioritized for rehabilitation as a sports center in Tebet sub-district. The selection was decided with consideration of the advantages in terms of ease of public transportation because it is on an environmental highway and close to the Tebet station, there is potential from the visual aspect, as well as the availability of access for emergencies. However, the Tebet sports center has not yet adopted the concept of universal design, so it is necessary to apply the concept, in order to provide convenience, usability, safety for users of existing facilities in the environment and buildings.

The application of the Universal Design approach to sports centers is carried out with due regard to the principles of Universal Design which is divided into 7 aspects, namely:

1. Fair and wise use (Equitable Use)

Designs that can be used and marketed to everyone, including those with physical / disability limitations.
2. Flexible in use (Flexibility in Use)
Design can accommodate a variety of individual preferences and abilities.

3. Easy and fast perceived sensory (Perceptible Information)
It can effectively convey information that is needed by the user, regardless of the situation, the level of conditions and the user's sensory abilities.

4. Simple and intuitive (Simple & Intuitive)
Easy to understand, regardless of differences in background, experience, knowledge, language, skills and concentration levels of users.

5. Tolerance for errors (Tolerance for Error)
Able to reduce the risk of danger and loss due to accidents or unwanted events.

6. Low physical effort (Low Physical Effort)
Can be used efficiently, comfortably and with a low level of fatigue.

7. Size and space for user convenience (Size and Space for Approach & Use)
Use of size and space that is reasonable and appropriate as an approach, achievement and use, regardless of the size of the body's posture or mobility of its users.

The application of the design related to the aspects of fair and wise use (Equitable Use) is done by:
(a) the wheelchair user and his companion will be in the same audience stands, (b) there are no columns that obstruct the view, (c) colored lines contrast is added to the building entrance glass (see figure 1).

![Figure 1. Application of the principle of equitable use and flexibility in use.](image)

The application of design related to the flexible aspects of use (Flexibility in Use) is done by: (d) there are no obstacles to the receiving area, directly given a path from the drop-off area outside the building, and the barrier-free path to the entrance is made in contrast and linear to makes it easy for users (see figure 1).

The application to design related aspects Perceptible Information is easily and quickly carried out by: (e) important information such as building entrances will be given visual emphasis such as canopies or contrasts in color including the color of the audience seats and circulation paths, (f) parking symbols for disabled people are colored off and markers on the pavement near the entrance to each parking stall, (g) facilities and services for the disabled can be identified with the appropriate symbols, (h) signage including large braille symbols, having tactile contrast, (i) signage is located outside the entrance, (j) all alarm systems must include auditory and visual signals (see figure 2).
The application of the design related to simple and intuitive aspects (Simple & Intuitive) is done by: circulation in the building will be made linear so that it is easy for all users to go to the facility, and not use many doors including the washroom area.

![Image](image1.png)

Figure 2. Application of the principle of Perceptible Information and Tolerance for Error.

The application to design related to the aspect of tolerance for errors (Tolerance for Error) carried out by means of: hazard warning will be made of sufficient contrast and magnitude so that it is easily visible, (k) contrasting colors and tactile surfaces on all ramp bases and different textures on top of the ramp to warn of changes in height (see figure 2), all furniture must be placed out of the main road and detected by people using sticks.

The application to design related aspects of Low Physical Effort is carried out by: accommodation of specific facilities and also every furniture must be in accordance with standards, disabled parking areas are placed close to the lobby, Barrier - free path that is not blocked (minimum 1200mm ) from the parking area to the entrance of the building (no trash, signage and other obstacles; the path is given a contrasting color), using the type of push door without using a handle to facilitate its operation.

The application of the design related to aspects of size and space for user comfort (Size and Space for Approach & Use) is done by: Making a comfortable reach for all components that can be used by each user, either sitting in a place or standing. Provide sufficient space for the use of assistive devices or personal assistance. The distance of the door is 800 mm and when the door is opened it must be 90 degrees. The main entrance must be accessible (automatic entrance is optimal). If the entrance continues, leave enough room (1200 mm along with the width of the door) for the wheelchair user to occupy the front room when opening the second door. The level of the entrance threshold (maximum is 13 mm). Steps for stairs have a height of 125 mm and 180 mm and width is 280 mm. The maximum ramp slope is 1:16, and the minimum ramp width is 1500 mm for 2 wheelchairs. The handrail must have a contrasting color from the wall, and provide 2 heights without obstruction (865 mm and no more than 965 mm). Handrail is added horizontally at the end of the ramp.

4. Conclusion
Public facilities that are suitable for use by all people, including those with disabilities, become demands for the provision of current and future buildings that support sustainable architectural design. The design of a Sports Center Rehabilitation that applies universal design principles will make public facilities suitable for all people including those with disabilities. The Universal Design Principles used
or applied to architectural designs are Equitable Use, Flexibility in Use, Perceptible Information, Simple & Intuitive, and Tolerance for Error, Low Physical Effort, and Size and Space for Approach & Use.

All forms of design that can cause danger must be removed, information on each side of the building must be contrasted so that it is easily identified by all users of the facility, and some facilities must follow the size rules such as ramp, stairs, and also handrails. Sports center rehabilitation which adopts the principle of universal design is expected to add the value of positive social integration and provide equal facilities among the people with various physical conditions (disabled and non-disabled).

References
[1] United Nations Habitat Retrieved from http://www.un-documents.net/ha-4c.htm#C-11
[2] Economic and Social Inclusion Corporation 2008 What is social development Retrieved https://www2.gnb.ca/content/gnb/en/departments/esic/overview/content/what_is_social-development.html
[3] Banton M Makalah Integrasi Sosial : Pengertian, Bentuk, Tahapan, Contoh Dan Faktor Retrieved from https://www.gurupendidikan.co.id/integrasi-sosial/
[4] Gilin Integrasi Sosial Retrieved from https://www.gurupendidikan.co.id/integrasi-sosial/
[5] Nimkoff F D Syarat berhasilnya suatu integrasi sosial Retrieved from https://www.gurupendidikan.co.id/integrasi-sosial/