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PARTICIPATORY ACCESSIBILITY AUDITS AND DESIGN PROPOSAL FOR INCLUSIVE MOSQUES

Arina Hayati[1]*, Kirami Bararatin[1], Setyo Nugroho[1], Qonita Wahyu Deanti[1], Mirra Kamila Ismail[1], Zuhrotul Mawaddatil Ula[1], Hana Ardina Putri Pakiding[1]
[1]Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia
*arina_h@its.ac.id

Abstrak: Bangunan masjid merupakan bangunan ibadah yang dapat digunakan dan dimanfaatkan oleh jama'ah untuk melakukan ibadah tanpa terkecuali, termasuk lansia dan penyandang disabilitas. Sebagian besar bangunan masjid didesain dan dibangun secara megah, namun belum memenuhi standar peraturan aksesibilitas bangunan. Fasilitas penting masjid terutama tempat wudhu dan kamar mandi masih sulit diakses dan aman bagi jama'ah berkebutuhan khusus. Oleh karena itu, beberapa masjid berbenah dan menambahkan fasilitas agar masjid dan lingkungannya lebih ramah untuk jama'ah, salah satunya adalah Masjid Shalahuddin di Sidoarjo. Paper ini memberikan deskripsi bagaimana tim pengabdi dari Departemen Arsitektur ITS bekerjasama dengan komunitas penyandang disabilitas untuk melakukan pendampingan audit aksesibilitas lingkungan dan bangunan. Selain itu, kegiatan memberikan rekomendasi desain masjid agar memenuhi prinsip desain universal dan inklusif. Dengan pendekatan partisipatif, pengabdian melibatkan pengurus dan jama'ah berkebutuhan khusus saat melakukan eksplorasi dan evaluasi audit aksesibilitas majid. Hasil kegiatan berupa kegiatan simulasi sensitifitas kemudahan bangunan dan rekomendasi rancangan ruang wudhu dan kamar mandi yang aman, nyaman, dan mudah digunakan oleh semua jama'ah tanpa terkecuali.

Kata Kunci: aksesibilitas, disabilitas, lansia, masjid, desain partisipatif

Abstract: Mosque buildings should be accessible and usable by all users for worship without exception, including older people and people with disabilities. Despite the magnificent designs, many mosques often fail to meet building codes and standards for accessibility design. For example, crucial facilities such as ablution areas and bathrooms remain difficult for those with special needs to use safely. Therefore, several mosques have taken steps to enhance accessibility and accommodate users with special needs. One noteworthy example is the Shalahudin Mosque in Sidoarjo. To address these issues, a community service team of lecturers and students from the ITS Architecture Department collaborated with people with disability's community. The aims are to promote awareness of the sensitivity and understanding of universal and inclusive design principles. Furthermore, the team provided recommendations for designing accessible ablution rooms and accessible bathrooms in mosque buildings. The community service employs a participatory approach throughout the process, involving mosque officials and administrators along with users with special needs in exploring and evaluating the mosque's accessibility audit. The results include simulation exercises demonstrating the importance of building convenience sensitivity and recommendations for the design of ablution rooms and bathrooms that are safe, comfortable, and easy to use for all users without exception.

Keywords: accessibility, disability, older people, mosque, participation

Introduction

A place of worship should be accessible to all user, regardless of their background or abilities. Mosques are easily found in many locations, but locating mosque buildings that are accessible and accommodating to people with special needs, especially regarding ablution (wudu) facilities and toilets, is often difficult. Generally, mosques' designs often emphasize

grandeur and sanctity, reflecting the majesty of God through large-scale buildings and spaces with many steps or stairs. Consequently, many mosques often overlook the importance of ease of use, safety, and accessibility, particularly for users with special needs, including older people and people with disabilities.

Mosque designs should provide user-friendly and accessible facilities for all users without exception, such as the availability of guiding paths for the visually impaired, minimum width for pedestrian pathways, road surface inclines, wheelchair straps, and more (Chamadi, Fauzi, & Kuntarto, 2020; Rahayu, 2019). According to Ministerial Regulation No. 30/PRT/M/2006 on Technical Guidelines for Facilities and Accessibility in Buildings and the Environment (PUPR, 2006), mosque accessibility can be assessed through all building elements, including pedestrian pathways, parking areas, entrances, corridors, ramps, stairs, elevators, toilets, sinks, and ablution areas (Afudaniati & Himawanto, 2018). However, many empirical studies on mosque buildings reveal discrepancies in facilities compared to the standards or guidelines outlined in the Ministry of Public Works and Public Housing of the Republic of Indonesia Regulation No. 14/PRT/M/2017 concerning Building Ease Requirements (PUPR, 2017). Previous research has identified several accessibility issues in mosque buildings, including ramp slopes that exceed the standard angle, lack of floor markers, absence of dedicated wheelchair paths with non-slip flooring (as shown in Figure 1), and handrails along toilets (Rahayu, 2019; Stetieh, 2023).

Figure 1. The design of the ablution area is still challenging for wheelchair users to use

Besides, previous research is more likely to evaluate mosque designs from practical and regulations perspectives without further consideration of the experience and perception of users with special needs (Aji et al., 2022; Siwi et al., 2021; Soegoto et al., 2020; Stetieh, 2023). For example, the study by Yumadhika and Sholihah (2019) provides information on the design of ablution facilities for users with special needs, however, the involvement process of participants with disabilities in determining the design outcomes is not thoroughly described and the design concepts primarily refer to the PUPR (2017). To effectively respond to the specific needs of users, it is essential to apply information-gathering and knowledge-building processes collaboratively with the users. According to Watchorn, et al. (2023), it is crucial to involve the participation of users with disabilities when aiming to implement universal and inclusive design.

The provision of an inclusive built environment cannot be achieved unilaterally but must involve the participation of all parties (Hayati et al., 2017; Hayati et al., 2024; Hayati et al., 2021). Moreover, participatory design, particularly involving vulnerable communities, can foster empathy in the architectural design thinking process. Therefore, this motivates the service team to explore the needs of mosque users, especially those with disabilities, to develop an understanding and mindset based on empathy rather than sympathy. This community service activity acts as a bridge between the service team (Department of Architecture, ITS) and the management of Shalahuddin Mosque in Sidoarjo to formulate an accessible mosque design concept involving the active participation of users with special needs including older people and people with disabilities (Setyawan, 2023).

This community service's activity is to implement the joint commitment stated in SDGS goal 10 on reducing inequality and goal 11 on creating sustainable cities and settlements, specifically by improving environmental quality and inclusive communities when using worship facilities, such as mosques. The contributions of this Community Service activity are: (1) building the mindset and shared perceptions about the importance of inclusive worship facilities; (2) assisting partners in implementing activities to improve and enhance the quality of inclusive mosques; (3) providing opportunities for mosque users with special needs to directly participate in the activities. This activity follows the same methodology as the previous community service activity, involving the active participation of partners, especially those with special needs – people with disabilities (Hayati et al., 2021).

Method

The strategy of this community service project is carried out collaboratively between the service team and participatory-based partners. The activity strategy employs a participatory process through User-Centered Design strategy which comprises 4 steps, as shown in Figure 2: analysis, design, evaluation, and implementation (Foundation-IxDF, 2016).

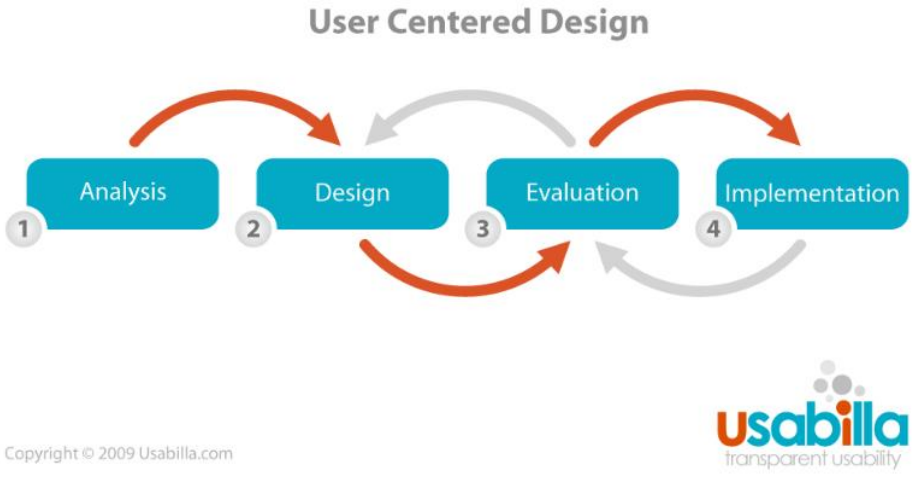


Figure 2. UCD process in developing design products (The Interaction Design Foundation, 2002) Copied from: https://www.interaction-design.org/literature/topics/user-centered-design, downloaded on 12 November 2023 at 16.30

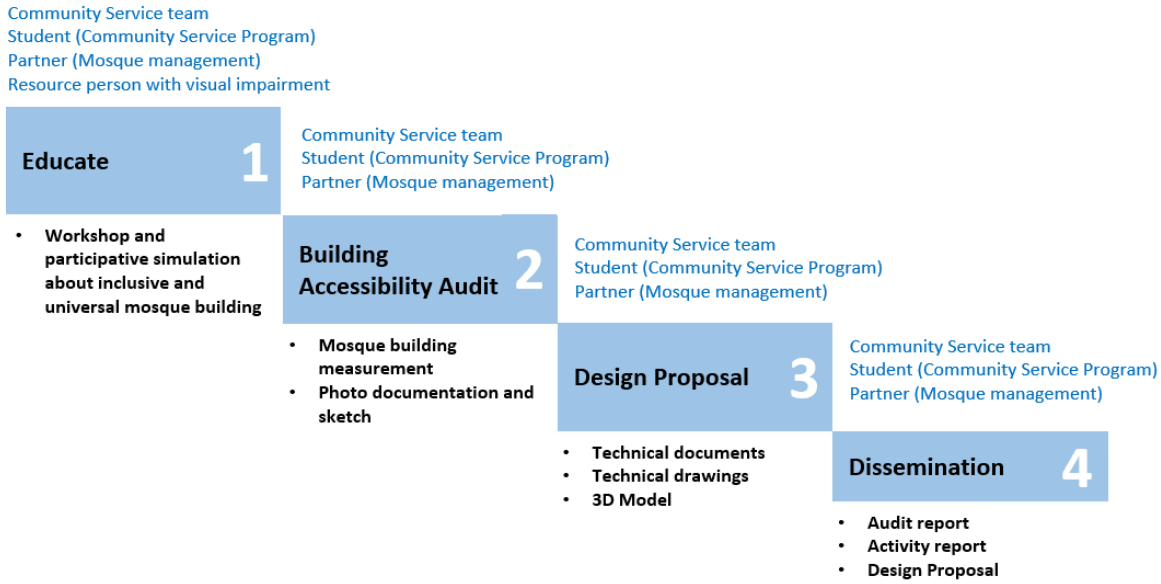


Figure 3. Community Service Project Flowchart

This community service is conducted at the Shalahuddin Mosque, which is located in one of the Sidoarjo City residential areas. This project aims to formulate the concept of mosque design that is accessible and user-friendly through a participatory design approach. This activity not only involves the board of Salahuddin Mosque but also engages one of the organizations of people with disabilities in Sidoarjo, namely the Information and Consultation Center for Women with Disabilities (PIK-PPD). Several stages of activities that are carried out by the service team (Figure 3), including:

1. Providing understanding or education about the importance of an inclusive environment in mosque buildings and fostering the mindset of foundation managers, administrators, and caretakers towards the sensitivity of accessibility issues and the necessity of buildings that are accessible to all users. This stage is carried out in a participatory manner through workshops and simulations regarding inclusive mosque buildings involving activists of women with disabilities (PIK-PPD).
2. To provide the same perspective, administrators and activists with various disabilities (visual impairments, hearing impairments, wheelchair users, and crutch users) collectively conducted a building accessibility audit. Activities include identification, measurement, and documentation of the facilities of the mosque. This audit activity was carried out by the service team, mosque management, and several older people users and people with disabilities together with a communal iftar event in Ramadan 2023 (Figure 4).
3. Providing proposed design improvements for the mosque to be more accessible and comfortable, especially for older people and individuals with disabilities. The proposed design is adaptive, making it easy to implement, low-cost with minimally invasive to the existing building conditions. The design is the result of a participatory design process incorporated with the feedback from individuals with disabilities obtained during workshops and simulations. The design is presented in architectural tools such as floor plans, views, sections,

technical drawings, and 3D models.

4. The dissemination of the inclusive and accessible design results through a participatory approach. Dissemination includes the presentation of mosque building audit reports and proposed mosque designs to the mosque administrators and representatives of users with disabilities.

Results and Discussion

The community service consists of three stages of implementation. The activity began with an invitation from the management of Shalahuddin Mosque in Sidoarjo to the community service team. The first meeting was held on April 5, 2023, where the team, along with the head of the Pusat Informasi dan Konsultasi Perempuan Penyandang Disabilitas (PIK-PPD), an organization concerned with women with disabilities, attended the mosque management's invitation to share information and engage in discussion (Figure 4).

Figure 4. Initial visit to Shalahuddin Mosque to collect information and documentation.

The primary goal of this community service project is to fulfill the request and objectives of the management of Shalahuddin Mosque to improve and renovate several mosque facilities, particularly the ablution area and bathrooms. The new design aims to be more accessible and user-friendly for older people and people with disabilities. The community service was conducted on a participatory basis to gather more in-depth and comprehensive information. By involving users with disabilities, the project aims to foster a mindset and perception of the importance of inclusive worship buildings.

The outcome of this community service project includes data on the existing building and an accessibility audit. This audit involved identifying, measuring, and documenting the mosque's facilities with the participation of the service team and students from the Department of Architecture at ITS. The community service also involved five members of PIK-DPP with various disabilities, such as visual impairment, hearing impairment, and physical disabilities, along with the management of Shalahuddin Mosque. This activity coincided with a Ramadan iftar event that invited orphans, older people, and people with disabilities. The audit results reveal that

several elements and facilities of the mosque need improvement to meet building accessibility standards according to PUPR (PUPR, 2017), particularly in the entrance and corridor areas, bathrooms, and ablution areas.

The mosque's main entrance and corridor have several steps, which pose a challenge for special needs users, such as older people and people with disabilities. Therefore, a ramp is needed—an element with a specific slope to connect two areas of different heights. Although the mosque already has a ramp, its steep slope (more than 15%) makes it difficult for wheelchair users to use without assistance (Figure 5-e). Additionally, the floor between the main entrance and the corridor leading to the ablution area is not directly connected, and the stairs in this area are challenging for people with disabilities to navigate (Figures 5a, 5b, and 5c). The floor material is relatively slippery, and there are no guide tiles or railings to assist visually impaired individuals in reaching the ablution area directly from the main entrance (Figure 5d).

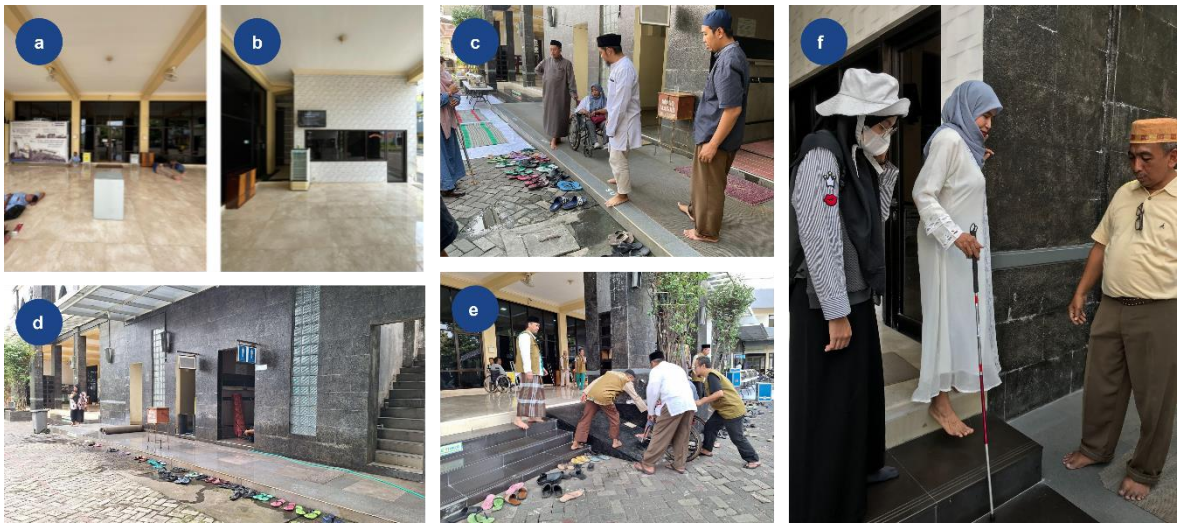


Figure 5. Mosque's main entrance and corridor with inaccessible steps for the disabled.

The proposed improvement includes leveling the floor height of the entrance corridor with that of the ablution area corridor (Figures 5d and 5e). To accommodate wheelchair users, one of the main entrance stairs near the ablution area corridor are replaced with a continuous ramp extending from the ablution area corridor to the main entrance courtyard (Figure 6). The ramp is equipped with continuous railings that extend to the ablution area to assist visually impaired users.

Several difficulties were identified for users with disabilities in the ablution area and bathrooms, including those who use wheelchairs, crutches, and those with visual impairments. The ablution area has an elevation difference at the entrance, and the bathrooms have door sizes and spaces that are inaccessible for wheelchair users. The ablution area lacks boundary cushions (stoppers) or covers for the water drainage channels, and the seating area is not equipped with handrails to assist older people or crutch users (Figure 7).

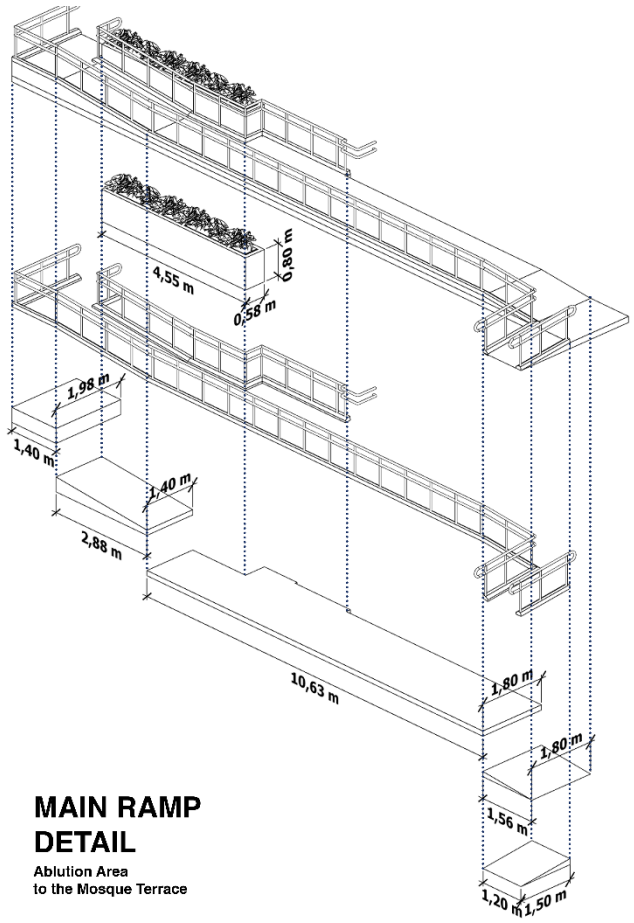


Figure 6. Proposed ramp and corridor design which connect the main entrance with ablution area.

Figure 7. Observation of accessibility challenges in the female ablution area

Based on the observations, the existing conditions of the ablution area and mosque bathrooms show potential for improvement. The number of bathrooms provided is ideal, and there are sufficient chairs in the ablution area, which is also equipped with wall-mounted shelves and mirrors. Additionally, the condition of the bathrooms is adequate. However, some constraints need to be addressed in the proposed design. For example, there are too many elevation and height differences between the entrance and the exit. The mosque also lacks an accessible bathroom for people with disabilities. Furthermore, the partition wall is overly long, making it difficult for wheelchair maneuvering. The drainage in the ablution area is also not equipped with a cover, making it potentially dangerous.

From the analysis of the observation results, two proposed design improvements for the ablution and bathroom areas have been identified. The first proposal for the ablution area suggests adding handrails and railings around the faucets and seats. To ensure the safety of wheelchair users, the water channel along the ablution area should be covered or fitted with a stopper, preventing wheelchairs from slipping. The placement standards, size, and height of the ablution seats will be designed to comply not only with PUPR regulations (PUPR, 2017) but also with the suggestions provided by users with disabilities during building amenity audits (Figure 8 and Figure 9).

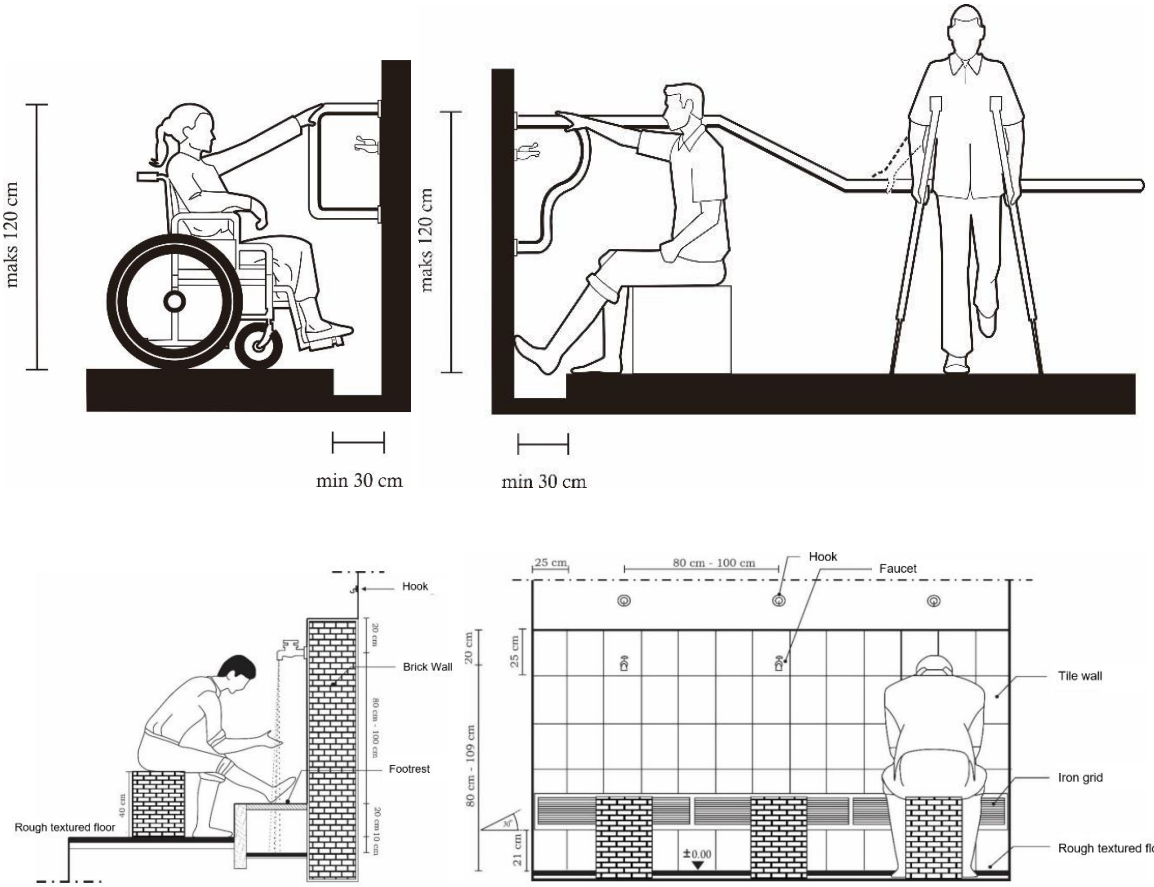
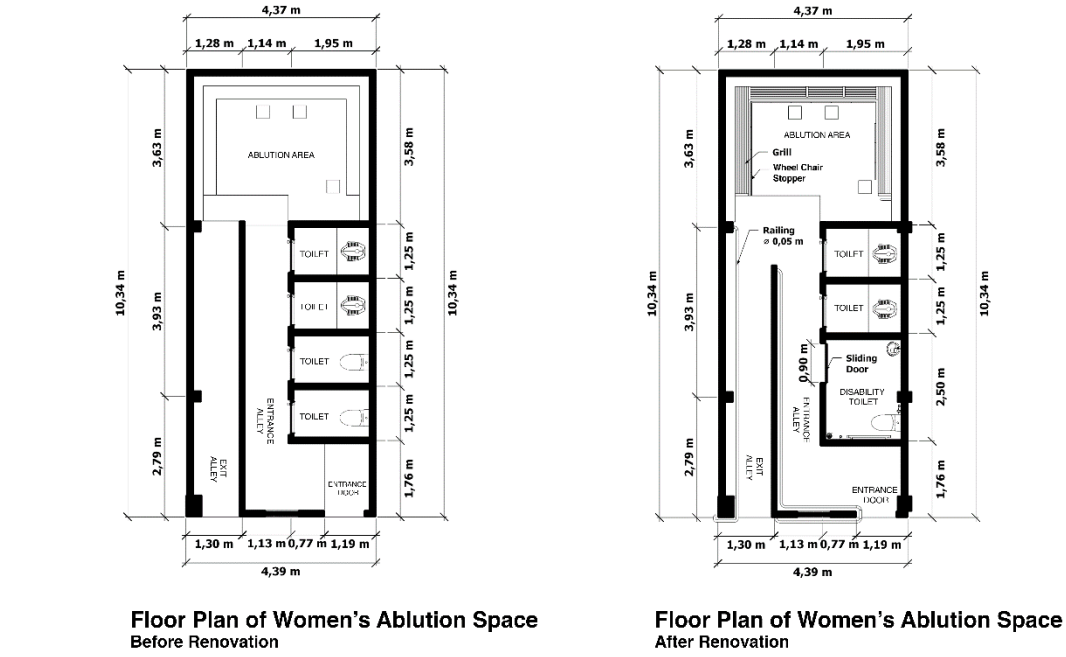
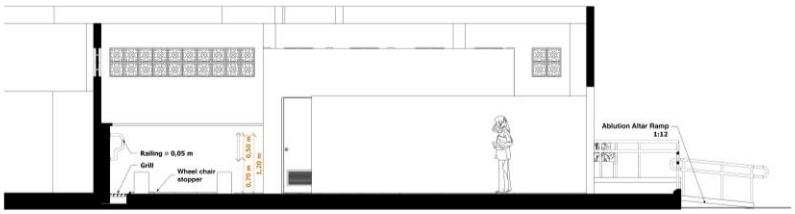


Figure 8. Design Standard for Standing and Sitting Ablution Area for People with Disabilities
Source: PUPR (2017)





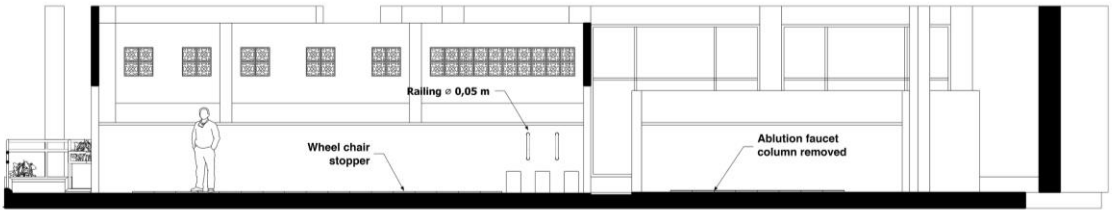


Figure 9. Floor Plan and Section of Ablution and Bathroom Area (Before and After Renovation)

The existing bathroom area is inaccessible to wheelchairs due to the narrow space and entrance door dimensions of less than 75 cm. Therefore, the proposal for an accessible bathroom involves demolishing two out of the four existing bathrooms to create three bathrooms, one of which dimensions meets the requirements for wheelchair maneuver. The bathroom with a squat toilet will be replaced with a sitting toilet and equipped with handrails positioned according to building accessibility regulations (Figure 10).

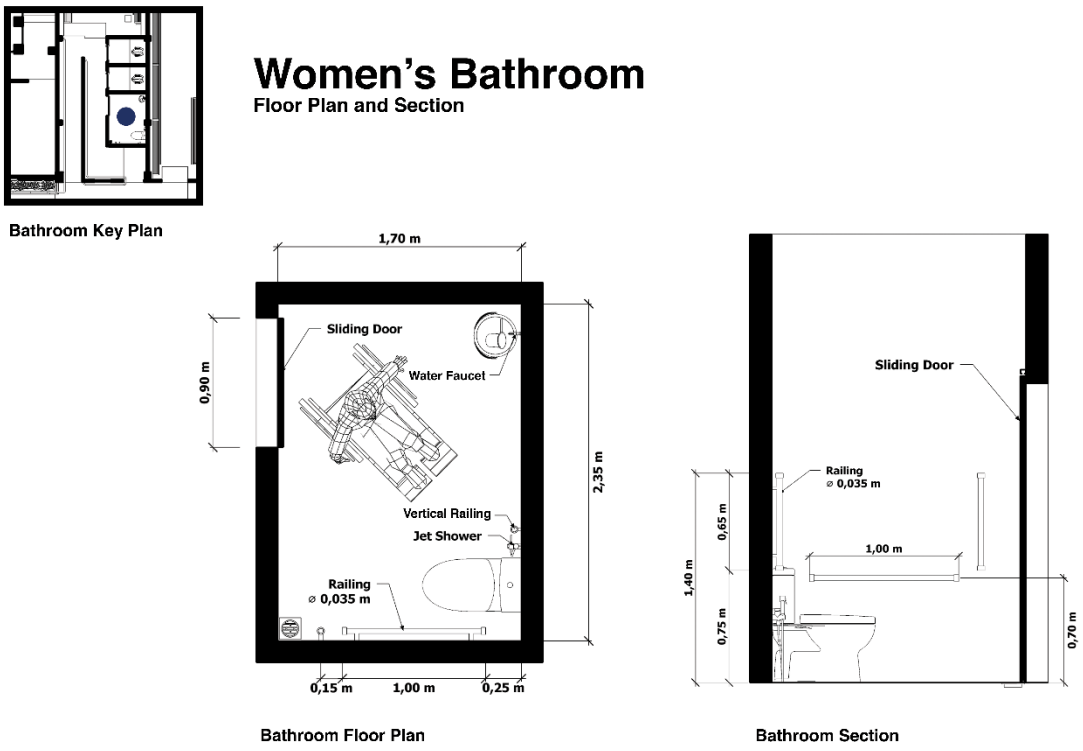


Figure 10. Floor Plan and Detail of Bathroom for Wheelchair Maneuver

The proposed renovation design for the mosque facilities can be implemented and used as an example of 'good design practice' for inclusive mosques. The proposed design is adaptive and easy to implement as it does not significantly alter the original building conditions. The design is presented in floor plans, elevations, sections, technical drawings, and 3D models. The final result can be seen in Figure 11 as a visual representation of the proposed changes from the existing conditions. 1) Propose improving the design of the main ramp connecting the ablution area with the mosque altar and the ramp at the entrance of the ablution area. 2) Propose a ramp area from the outer courtyard to the bathroom floor area. 3) Proposa bathroom renovation, including expanding the bathrooms for women and men and adding handrails. 4) Propose to add stoppers and gills to the drainage system, add handrails to the ablution seats, demolish a 1-meter section of the partition wall in the women's ablution area to facilitate wheelchair manoeuvre, and add handrails in the women's ablution area surrounding the wall from the entrance to the main ramp. 5) Propose to remove the faucet column in the rear ablution area to open an alternative route for wheelchairs accessible by male congregants. The improvement/renovation proposals were not only provided by the service providers but also received input from the disabled participants who took part in the audit activities at Shalahuddin Mosque.

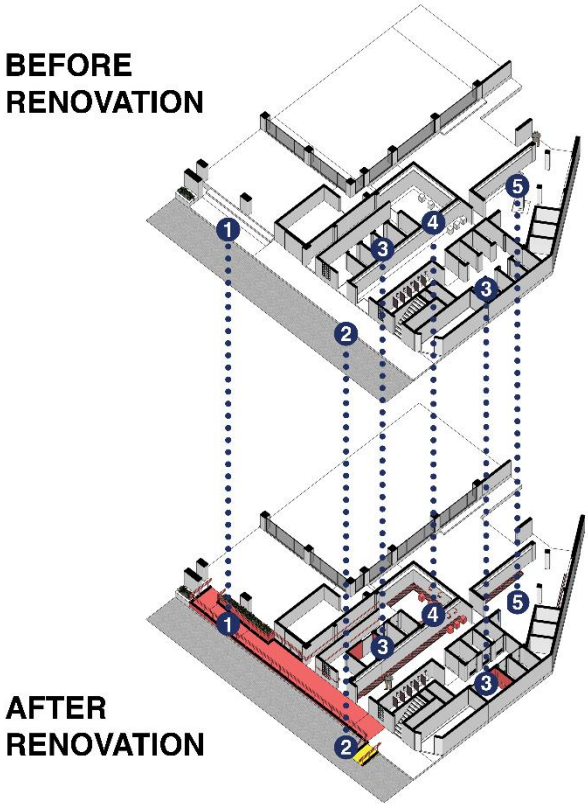


Figure 11. The final results before and after the proposed renovations for all facilities (ablution area, toilets, and mosque corridors/hallways)

Conclusion

This Community Service activity successfully formulated four design concepts for a mosque that is accessible and friendly to all users, using a participatory design approach. First, the proposal includes a design for the main area connecting to the ablution space with continuous ramps and railings. Second, the design for the ablution space incorporates additional handrails and stoppers. Third, the proposal suggests modifying two existing bathrooms to become one accessible by changing 2 existing restrooms/toilets into 1 restroom/toilet that are friendly for people with disability and older people. This strategy is expected to inspire mosque designs that are accessible and welcoming, while also raising awareness among all stakeholders (users, owners, and designers) about the importance of providing ease of access for older people and persons with disabilities in public buildings, particularly mosques.

Acknowledgment

This Community Service activity is part of the Community Service Scheme funded by the Department of Architecture, Institut Teknologi Sepuluh Nopember (ITS) for the 2023 academic year. The activity was also supported by the partners at the Center for Information & Consultation for Women with Disabilities (PIK) Sidoarjo and Shalahuddin Mosque Sidoarjo.

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