JOURNAL OF ISLAMIC ARCHITECTURE
P-ISSN: 2086-2636 E-ISSN: 2356-4644
Journal Home Page: http://ejournal.uin-malang.ac.id/index.php/JIA

ARE PERSONS WHO USE WHEELCHAIRS ABLE TO ACCESS EXISTING MOSQUES?

| Received November 18th, 2022 | Accepted March 25th, 2023 | Available online June 20th, 2023 |
| DOI http://dx.doi.org/10.18860/jia.v7i3.18132 |

Hibatullah Stetieh
Department of Architecture Engineering
School of Engineering
University of Jordan
Jordan

Corresponding Author:
h.stetieh@ju.edu.jo

ABSTRACT

One of the Persons with Disabilities (PWDs') rights is participation in religious ceremonies, and mosques are where most Muslim religious activities are conducted. The present descriptive qualitative research investigates the accessibility of Persons Who Use Wheelchairs (PHUWs) to The University of Jordan's (UJ) mosque and the attached Islamic cultural center in light of national codes. The study was carried out through observations, photographs, and measurements using the maps and blueprints of the UJ mosque. The study found that the UJ mosque and its attached facilities had some accessible entrances, but many spaces lacked accessibility for PHUWs. For example, some ramps did not comply with standards, and PHUWs couldn't use them independently. In addition, the blueprints had proposed converting an existing WC unit into an accessible one for PHUWs, but this was not achieved. Instead, a new expansion added a fresh barrier to PHUW. The study recommends ensuring accessibility in mosques, monitoring accessible entrances, and raising awareness of PWDs' rights. Adopting some of the other Islamic countries' standards to improve national accessibility codes is also recommended. The study findings can benefit from renovating mosques and Islamic cultural centers in Jordan and other countries.

KEYWORDS:
Accessibility; Built environment; Mosques; Persons with disabilities; Places of worship.

INTRODUCTION

The concern of Persons with Disabilities (PWDs) issues and their social inclusion is not new; in old Islamic times, PWDs were treated well, and some examples were recorded. More than ten times, Prophet Muhammad -peace be upon him- appointed Abdullah ibn Um-Maktum, who was blind, to care for Madinah's affairs when the Prophet was going outside Madinah. Abdullah ibn Um-Maktum was also made one of the muezzins (the criers for prayer). That happened in the Hijri years from 2-10 [1] (623-631 AD[2]). Also, during Umar bin Abd Al-Aziz's caliphate, in the Hijri years from 99- 101 (717-720 AD [2]), a mobility assistant was appointed for every person with blindness. A servant was assigned for every two persons with a mobility disability or a chronic disease [3]. So, the Islamic State never marginalized PWDs; instead, it encouraged them to perform their role in society [4].

Internationally, concern about PWDs started after World War II by building separate housing complexes suitable to PWDs. But later on, this practice was deemed as isolating them from society. So, the new trend was to make the environment accessible to PWDs and merge them with society [5]. The UN adopted the convention on PWDs rights in 2006, which ensures several rights to PWDs, including access to public buildings and participating in public events, etc. [6].

According to the Convention, PWDs were defined as persons with long-term impairment, varying between physical, intellectual, mental, and sensory impairment that may prevent those persons from participating in social activities [6].

Abbreviations:
BRCD, Building Requirements Code for the Disabled;
BRCPD, Building Requirements Code for Persons with Disabilities;
ICC, Islamic Cultural Center (at the University of Jordan);
PHUWs, Persons Who Use Wheelchairs;
PWDs, Persons with Disabilities;
UJ, The University of Jordan.

Accessibility -according to the convention- consists in securing PWDs' independent access to transportation, information, communication, any public service or facility, and the physical environment. The physical environment includes streets, sidewalks, buildings, and outdoor spaces [6].

Jordan ratified the PWDs' rights convention in 2008 [7]. Then it started licensing proposed public buildings and refurbishing existing ones according to the Jordanian National Building Codes- Building Requirements Code for the Disabled (BRCD) [8], issued previously in 1993 [5].

The recent Jordanian "Persons with Disabilities Rights Law" -issued in 2017- insured PWDs' rights to participate in society's activities and events, and accordingly, barriers –both physical and attitudinal- should be removed. According to Article 33 of the Law, all proposed buildings that serve the public -including places of worship and tourist locations- should ensure PWDs' accessibility. Blueprints should also be checked before constructing the building; if lacking accessibility, the licenses and work permits wouldn't be granted. The law assigned to the Ministry of Public Works and Housing, Greater Amman Municipality, and relevant governmental institutions the task of renovating all existing public buildings and facilities, places of worship, and tourist sites, to become accessible to PWDs within 10 years of the law's effective date [9]. Accordingly, a new national code was published: the Building Requirements Code for Persons with Disabilities (BRCPD) [10]. The law clarified that to obtain accessibility, public buildings and public spaces should follow BRCPD standards, and buildings should be adjusted under BRCPD [9].

According to BRCPD's section 10/9, PWDs should be able to access all religious buildings (mosques and churches) and use all public spaces inside [10].

Regarding mosques, the code ensures PWDs' accessibility to and the ability to use all mosques' facilities, such as prayer halls -including women's, the cultural center, and other spaces. Furthermore, the mosques should also be provided with WC units and ablution areas suitable for PHUWs. In addition to these accessibility requirements special to mosques, general requirements include securing special parking lots and using ramps and elevators if needed, etc. [10].

The Persons Who Use Wheelchairs' (PHUWs) need different treatment from those of other PWDs'. A study on public buildings in Malaysia found that PHUWs' main barriers were level differences, steep slopes, inappropriate door sizes, and structural barriers in front of ablution faucets. In fact, PHUWs need a sufficient maneuvering area inside their special WC unit and a special car parking [11].

Based on the preceding facts and observations, the present paper investigates PHUWs' accessibility to existing mosques in Jordan, i.e., those built before putting the first accessibility codes (BRCD) into action (before 2008). The evaluation will be made in light of the new code (BRCPD).

MOSQUES' ARCHITECTURAL SPACES IN JORDAN

In Jordan, the Ministry of Awqaf and Islamic Affairs and Holy Places set the Mosques' required divisions as follows: main prayer hall (for men), women's prayer hall, minaret, hall for teaching Quran, imam and muezzin residences, WCs, wudu (ablution) area, a shroud room to prepare the dead for burial, car parking lot for worshipers. Mosques area may also contain shops and a garden, and large principal mosques contain an Islamic cultural center [12].

The minimum required spaces of a mosque are the main prayer hall, the imam's residence, WCs, and ablution space [12].

PWDS' ACCESSIBILITY AT MOSQUES

Research regarding mosques' accessibility for PWDs has been recently conducted. In Turkey, for example, Tutal showed a successful example of renovating a historical mosque, where accessibility of PWDs –with different disability types- was insured; this endeavor could be regarded as a reference for renovating existing mosques [13].

In contrast, in KSA, PHUWs faced many physical barriers at the main mosques in Riyadh, preventing them from praying in mosques. The mosques either lacked ramps at entrances or provided ramps that did not comply with standards. PHUWs couldn't move independently in the mosques, and most of the studied mosques were unequipped with PWDs' private parking lots and WCs. This revealed that accessibility policies were not implemented or reinforced [14].

Accordingly, the Saudi researcher Nazem AL-MANSOOR developed an accessibility checklist to evaluate mosques' facilities. It consisted of many elements that would make prayer places accessible. They included an accessible parking lot, special WCs and ablution units, an accessible storage area for shoes and cellular phones, chairs to sit on to take shoes off at entrances, and providing wheelchairs inside the mosque, etc. [15].

Using checklists derived from the national accessibility codes was often the main method to evaluate mosques regarding accessibility. For example, Utaberta et al. used a checklist derived from the Malaysian accessibility standards to evaluate PWDs' accessibility in a principal mosque in Malaysia. They found that it was incompatible with the accessibility code; as it lacked proper signage, lifts, and special WCs for PHUWs [16]. In addition, Mohamed, Talib, and Haron's study, which included 3 Malaysian mosques, used a brief checklist to assess PWDs' accessibility; they found that the available accessibility means were incompatible with Malaysian standards [17].

In the same country, Shobri, Zakaria, and Salleh also used a checklist and found that lack of finances and awareness led to the non-provision of accessibility means in the studied mosque. Another important reason was the local authority's lack of law enforcement [18]. Abd Samad, Rahim, and Said used an access audit checklist derived from Malaysian

standards to evaluate accessibility in a different Malaysian mosque. They focused on five main access challenges to check while upgrading the mosque's built environment to meet PWD's needs. These were the entrances, the wayfinding and path of travel, the prayer hall, the ablution area, and the WCs. They found that some PWDs' accommodations -such as private WCs- were not provided, and while some were provided, they did not comply with standards - as was the case in a steep ramp- [19]. Finally, Mohamad Nazir et al. found that most Malaysian mosques' samples (4 out of 5) were unequipped with WC units suitable for PHUWs [20].

In a study in Indonesia, the investigated mosque was not accessible to children with disabilities due to many obstacles, such as a steep ramp and lack of special WCs and parking areas… etc. [21].

Regarding the ablution area - a unique space found in mosques and near prayer halls, used for doing wudu before praying- Dawal *et al.* investigated and provided ablution area standards for Malaysian PHUWs' use [22]. In Indonesia, the standards for accessible ablution areas- issued in 2017- consisted of many requirements, such as a footrest for the PHUWs and also for persons with mobility disabilities, a place to store wheelchairs, and the ability to replace them with dry and clean ones to use inside the prayer hall, handrails and a place (a shelf) to place personal things during wudu. Yumadhika and Sholihah modified the Indonesian standards and proposed an ablution area model [23]. Yet, there was a problem regarding proposing tactile paving inside ramps, which would obstruct PHUWs; the tactile paving should be directed to the stairs, not to ramps [24][25].

This research is a descriptive qualitative one, and the case study is a well-known principal mosque in Jordan, The University of Jordan's (UJ) Mosque, and the attached Islamic Cultural Center (ICC) in Amman City.

The main building of the UJ mosque and the ICC were erected in 1982 [26], i.e., before issuing BRCD. The other buildings were built much later, in 2005 (as shown on the blueprints), i.e., before putting BRCD requirements into action. The mosque and ICC are located on the campus's northwest corner so that they can also be reached by the local community (Figure 1). The activities held in them are addressed to UJ's staff, students, and local community members. They include Friday sermons, lessons, Quran recitation courses, and a summer school for children. ICC also organizes scientific and Umrah trips for UJ students of Islamic affiliation and other activities [26].

To reiterate, the study aims to investigate PHUW's accessibility to UJ mosque in light of BRCPD and to recommend solutions to decision-makers to make UJ mosque's buildings and outdoor areas accessible to the faithful and various visitors who use wheelchairs. It also aims to suggest certain methods that can be implemented by architects and urban designers in countries that still seek to make their environments accessible for PWDs.

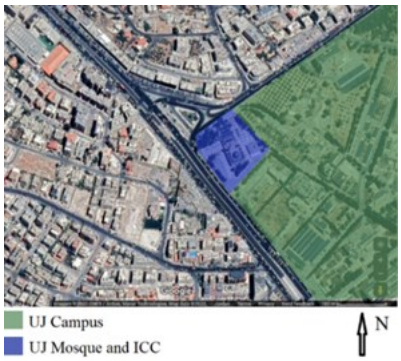


Figure 1. UJ Mosque's location on the UJ campus; adjacency to the surrounding community. Original map source: [27]

METHODS

This study applied some procedures to achieve its objectives. They included Google Maps [27] and the blueprints of UJ mosque's buildings to help recognize the buildings' spaces and determine the renovation efforts regarding accessibility, as well as pictures taken on observation tours to check current accessibility regarding means and barriers. By using the blueprints, the current situation was compared with the original one to determine any changes in accessibility after the new expansions. A brief checklist (Table 1), extracted from BRCPD, was also prepared to evaluate PHUWs' accessibility. The procedures finally included interviewing the administrator of UJ mosque and ICC to collect data about ICC's events and activities, as well as a UJ facilities committee member to identify the renovations at the mosque.

Table 1. A brief checklist for evaluating PHUWs'

Item	complied with standards?	Notes
Outdoor requirements		
Special parking lot		
Outdoor pathways		
Outdoor ramps		
Handrails		
Building entrance		
Indoor requirements		
Flooring		
Doors		
Entrance lobbies		
Reception		
Corridors		
Ramps		
Waiting areas		
Lecture halls		
Special WC units		
Special Ablution area		
Lifts		

The BRCPD's -Jordanian code's– standards for mosques were applied to the buildings of UJ mosque and its outdoors. This has been seconded by taking photographs during observation tours and using the mosque's buildings' blueprints.

Study time: Observations started in 7/2019 and continued until 9/2022, during the two months of the summer semesters.

FINDINGS AND DISCUSSION

UJ has recently renovated the physical environment at its mosque to become accessible to PWDs; blueprints show the proposed ramps and a special accessible WC unit within men's restrooms (Anonymous. Interview with UJ facilities committee member by author, September 1, 2022). Some accessibility features were added to the buildings, such as ramps (Anonymous. Interview with ICC's director by author, July 24, 2019).

UJ mosque consists of three buildings (Figure 2). First, building 'A' or the main building: is the Juma mosque (masjid jāmi) which consists of two floors: the ground floor accommodating the main prayer hall (for men) and a women's prayer hall, and the basement floor having the ICC's lecture halls, a multipurpose hall, and offices. Second, building 'B' is a two-storey building accommodating ICC's administration offices, lecture halls, and a multipurpose hall. Third, building 'C' is a one-storey building with the WCs and the ablution (wudu') area. The multipurpose hall in building 'B' has been used for university thesis discussion. (Anonymous. Interview with ICC director by author, July 24, 2019).

The results of applying the brief checklist to UJ mosque are shown in Table 2.

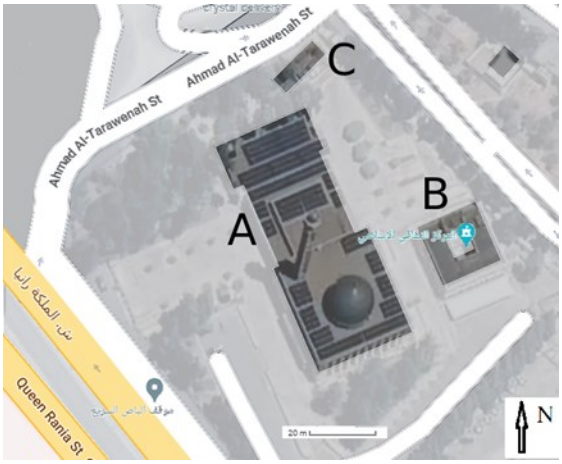


Figure 2. UJ mosque buildings: A: mosque proper; B: ICC's administration; C: WCs and ablution area (Author)

Table 2. Results of applying the brief checklist to UJ mosque

Item	complied with standards?	Notes
Outdoor requirements		
Special parking lot	Not available	
Outdoor pathways	Yes	
Outdoor ramps	3 of 6	1 ramp had a step 2 ramps had steep slopes
Handrails	No	Ramps' rails were lower than the standards
Building entrance	2 of 11	2 entrances were accessible; The other 9 were not
Indoor requirements		
Flooring	Yes	
Doors	Yes	
Entrance lobbies	No	Not provided horizontal rails
Reception	Not available	
Corridors	Yes	
Ramps	Not available	Men's WC had an indoor step without a ramp
Waiting areas	Yes	
Lecture halls	Yes	Some halls had neither windows nor mechanical ventilation
Special WC units	Not available	
Special Ablution area	Not available	
Lifts	Not available	

ACCESSIBILITY ANALYSIS OF UJ MOSQUE'S GATES AND ENTRANCES

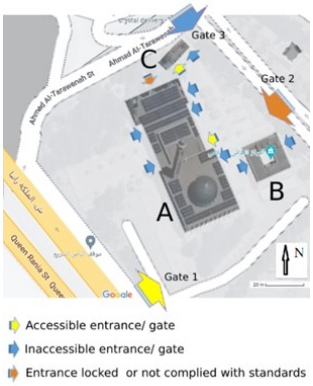
The UJ mosque has 3 gates (Figure 3 a). Gate 1 serves the community and is easy to use by PHUWs. Gate 2 connects the mosque with the UJ campus. It has stairs and a ramp with a steep slope exceeding 75 cm (figure 3 b), which is incompatible with BRCPD, which requires the maximum height of a ramp to be 75 cm and the maximum slope ratio to be 1:12 [10]. Gate 3 also serves the community but has stairs with no ramps, making it inaccessible to PHUWs.

The UJ Mosque buildings were also analyzed regarding accessible entrances –that enable PHUWs to enter the space independently- in Table 3 and Figure 3 (a). There were only 2 accessible entrances, one at the men's prayer hall (building A) and the other at women's WCs (building C), while all other entrances were inaccessible to PHUWs.

Even though the men's prayer hall had a ramp at building' A', that accessible entrance was too far from the community's gate (Gate 1), while the entrances close to the community's gate had no ramps.

Table 3. Analysis of entrances' accessibility at UJ mosque buildings

Building	Floor/ Part	Accessible entrance?	Barriers
Building 'A'	Ground floor Men's prayer hall	Yes	Only one accessible entrance; the others were not
	Ground floor Women's prayer hall	X	No ramp+ Accessible doors were locked
	Basement floor ICC's lecture halls	X	The ramp ended with two steps
Building 'B'	Ground floor	X	No ramp
	First floor	X	No lift car+, No ramp
Building 'C'	Men's WC area	X	Ramp removed+ Low barriers+ a step inside
	Women's WC area	Yes	



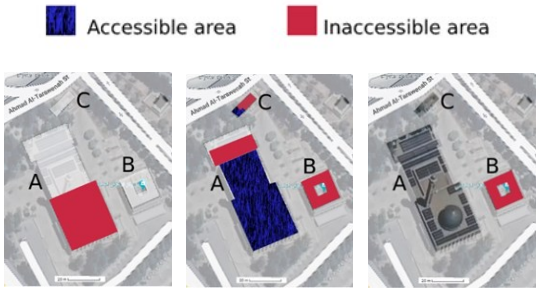
(a)

(b)

Figure 3. (a) Accessibility analysis of UJ Mosque's gates and entrances. The accessible entrance of building A is too far from the accessible community gate (Gate 1), Gate 2 has a steep ramp, and Gate 3 has stairs with no ramp (Author). (b) The ramp at Gate 2 does not follow standards, its height exceeding 75 cm (Author)

ACCESSIBLE SPACES

The accessible areas of each floor are shown in Figure 4. Most of the spaces were inaccessible.



(a) (b) (c)

Figure 4. (a) Accessibility of the basement floor of UJ mosque's buildings. Only building 'A' has a basement; (b) Accessibility of the ground floor; (c) Accessibility of the first floor. Only building 'B' has a first floor (Author)

THE OUTDOOR YARD'S ACCESSIBILITY AND BARRIERS

The outdoor yards of UJ mosque are provided -at level differences- with ramps. However, one of these ramps starts with a high step (Figure 5 a), lacking appropriate railing and having sidewalls of varied heights. That might have resulted from design or execution errors, making it unusable independently by PHUWs. The ramp also suffers from an uneven surface due to deflection (Figure 5 b), which would be unsafe and disable PHUW's use.

There are no parking lots for PWDs, while BRCPD requires dedicating one lot -for every 20 parking lots- for PWDs.

(a) (b)

Figure 5. (a) One of the ramps leading to the masjid building has a step at the beginning (Author); (b) The ramp suffers from deflection (Author)

BUILDING 'A': ACCESSIBILITY AND BARRIERS

In the main building, only one entrance to the men's prayer hall –serving the faithful coming from the UJ campus- has a ramp (Figure 6 a). The other entrances -including the outside community's main entrance - have no ramps (Figure 6 b). So, most PHUWs could not enter the prayer hall without aid.

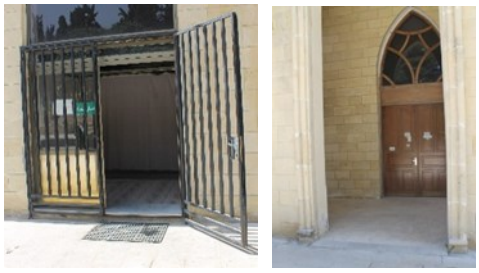
Regarding this issue, ICC's director maintained that people generally offer help to PWDs. (Anonymous. Interview with ICC's director by author, July 24, 2019). Even though offering help is a good gesture, yet steps require additional effort from the helping person. It is better to add ramps to facilitate

offering that help if needed, to enable PHUWs to reach the prayer hall independently and comply with BRCPD.

(a) (b)

Figure 6. Building 'A' (the Mosque) entrances: (a) An entrance at the men's section was accessible, and a ramp was added (Author); (b) The main entrance serving the local community has no ramp (Author)

The entrance of the women's prayer hall has a step with no ramp, making PHUWs unable to enter the prayer area independently; other accessible doors exist but are permanently locked (Figure 7). The issue of locked accessible entrances is mentioned as a major obstacle in another study about PWDs' accessibility to higher education buildings in Jordan [28].



(a) (b)

Figure 7. Building 'A' (the Mosque) entrances: (a) The entrance of the women's section has a step, no ramp added (Author); (b) An accessible entrance to the women's section, but it is permanently locked (Author)

ICC's lecture halls occupy the basement floor of building 'A'; they have a ramp leading to the entrance. However, it is useless because it ends with two inside steps (Figure 8), preventing PHUWs from participating in ICC's activities. That is incompatible with BRCPD, which requires ensuring PHUWs' entrance to and use of all mosque spaces and facilities [10].

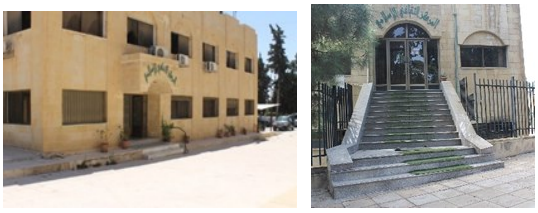
Some lecture halls on the basement floor lack windows and proper ventilation, making them unhealthy.

(a) (b)

Figure 8. (a) The ramp leading to the basement of building 'A' (Author); (b) The basement entrance with two steps (Author)

BUILDING 'B': ACCESSIBILITY AND BARRIERS

Building 'B' is a two-story one hosting ICC's administrative offices and a multipurpose hall. Its entrances have stairs but no ramps (Figure 9). A lift shaft exists, but no lift cabin was installed. Subsequently, there are no accessible WC units. This building is not accessible for PHUWs, which is incompatible with BRCPD requirements for religious buildings [10].



(a) (b)

Figure 9. The administration building (Building 'B') entrances are not accessible: (a) the ground floor's entrance with two steps (Author); (b) The entrance of the first floor with many steps (Author)

BUILDING 'C': ACCESSIBILITY AND BARRIERS

Building 'C' (the WC and ablution building) -as its blueprints showed- was redesigned to become partially accessible; it had ramps at entrances and had a special WC unit for PHUWs in the men's section.

However, in July 2019, it was observed that the existing ramp leading to the men's section was closed with a wall (Figure 10 a) built as a new expansion, while there was no attempt to add a new ramp. Recently, in 2022, the ramp was totally removed, and the entrance was surrounded by low barriers (Figure 10 b).

The new modification (removing the ramp) is blocking PWD's access. In addition, the low barriers are not only preventing PHUWs' access but also obstructing persons with visual disabilities. Those added barriers were probably a result of the lack of awareness about PWDs' rights.

For their part, female PHUWs are able to enter the WCs area using the ramp (Figure 10 c), but a special WC unit for PWDs was not provided, contrary to BRCPD [10].

(a)

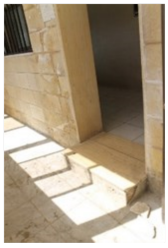
(b)

(c)

Figure 10. The WC building (building 'C') entrances: (a) The men's WC units were accessible with a ramp, then the ramp was blocked by a wall; the picture was taken in 2019 (Author); (b) In 2022, the ramp was removed, and low barriers were added to the entrance (Author); (c) The ramp leading to women's WC unit (Author)

Observation tours have revealed that the men's WC units have another stair inside, without a ramp (Figure 11 a), and that the proposed special WC unit in the men's section (in the blueprints) was not actually constructed and was found only in the blueprints.

The men's ablution area was not designed inclusively, i.e., it was not designed to include PWDs with other people without disabilities, so it was not suitable for PHUWs' use (Figure 11 b). The women's section has no ablution area. So, PHUWs of both genders could not use the ablution areas. According to BRCPD, the ablution area should contain a space suitable for PHUWs' use, but BRCPD gave no architectural details regarding the inclusive ablution area [10].



(a)

(b)

Figure 11. (a) A stair inside men's WCs (Author); (b) men's ablution area: There was no space suitable for PHUW's use (Author)

A summary of the physical barriers found in UJ mosque and the attached ICC and proposals to remove them are listed in Table 4.

Table 4. Physical environmental barriers at UJ Mosque and ICC and proposals to remove them

Location	Barrier	Proposed solutions
The outdoor yards	Steps at some ramps' beginnings and ends	Modifying ramps to meet standards
	Ramps with steep slopes	
	No special parking lot	Adding a special parking lot
The main building (Masjid) 'A'	The main entrance of the men's prayer hall has a step	Adding a ramp
	Women prayer hall's entrance has a step; other accessible entrances are locked	Adding a ramp and/ or re-opening the accessible entrances
	The basement floor entrance has two steps	Adding an indoor ramp with a landing
Administration's building 'B.'	Steps at entrances	Adding ramps
	No lift cabin	Installing a lift cabin
W.C.s' building 'C.'	A ramp was removed, and low barriers were added	Adding a new ramp to the entrance and removing the low barriers Awareness-raising
	No special WCs	Adding a special WC in both men's and women's sections
	No inclusive ablution area	Adding PWD's special ablution area

The steep ramp at Gate 2 needs to be rebuilt according to BRCPD standards. Gate 3 also needs additional ramps to become accessible.

Regarding the outdoor yards, the ramps that end with thresholds need to be modified by extending the ramp beyond the thresholds.

In parking areas, dedicating special parking lots to PWDs is recommended.

At buildings A', 'B', and 'C', providing every entrance with a ramp is recommended. On the basement floor of building 'A', there is a need to change the entrance design by adding an indoor ramp with a landing.

The administration building (building 'B') needs a lift cabin and special WC units for PHUWs. It is easy to add a ramp to the ground floor but hard to add an external ramp to the first floor because the level difference is very big.

Adding special units for PWDs in both genders' WCs is recommended in building' C'. Adding an inclusive ablution area in both sections is also desired.

CONCLUSION

The UJ mosque is regarded as one of the principal mosques in Jordan because it contains an Islamic cultural center. Its activities vary between Juma prayers, lessons, lectures and training, summer camps for children, religious celebrations, cultural meetings, and MA and Ph.D. thesis discussions. So, it commonly hosts many activities that may attract large audiences, including many PWDs who would like to attend them if accessibility is made possible.

Comparing the original blueprints of the UJ mosque with the current situation, the study has concluded that PHUWs' accessibility has received good attention. This is mainly represented by the existence of the previously accessible entrances at the women's section of the prayer hall, by adding ramps to level differences throughout the yards, at Gate 2, and buildings 'A' and 'C' entrances, and by designing an accessible WC unit in UJ mosque's blueprints.

However, this attention was insufficient because the concern is further complicated by the following barriers: steep slope ramps, ramps ending with thresholds or having deflection, permanently locked entrances, and new expansions that removed the existing ramps and added new barriers. In addition, the designed accessible WC unit was not built. Other facilities are not accessible at all (building 'B' and part of building 'A'); it seems that there was no attempt to refurbish building 'B' to become accessible.

The observed barriers in UJ Mosque buildings and outdoors are obstructing PHUWs. These barriers can be overcome by achieving some modifications in line with BRCPD requirements.

The locked entrances prevent PWDs' from benefitting from easy access. In building 'A', re-opening the locked accessible doors is recommended.

The proposed modifications to UJ Mosque and ICC buildings aim to serve the local community, including probable users with disabilities, and to enable ICC to employ staff with disabilities.

Supervision of building construction is highly recommended to prevent non-compliance with proposed modifications, such as not constructing the proposed special WC units, to ensure renovating buildings become accessible.

Also, ensuring PWDs' access before initiating any new expansion is recommended. In the case of the WC building (building 'C'), adding an alternative ramp before closing the existing one would have been better.

Mosque administrators were not conscious of PWDs' needs and rights. So, awareness-raising programs for these administrators are recommended to avoid blocking PWDs paths, especially when planning future expansions. Additionally, periodic monitoring of PWDs' paths is highly recommended to avoid future blocking.

Regarding the basement floor, which contained unventilated spaces, merging the un-windowed rooms with windowed ones and adding a mechanical ventilation system are recommended.

These modifications do not merely serve PHUWs but are also useful for any person who may be injured by an accident and any other person who may fall ill. They are also useful for any person pushing a baby in a stroller.

GENERAL RECOMMENDATION

Islamic countries should show more interest in PWDs' accessibility and affairs, using modern means; this complements interest in and cares about PWDs in the old heritage.

The Jordanian code BRCPD requires applying accessibility standards to religious buildings, including mosques. Existing mosques -built before issuing the code- may be inaccessible.

The ablution area's accessibility details are not included in BRCPD. BRCPD can be improved by benefiting from the laws and standards of other Islamic countries.

Viewing Dawal *et al.*'s standards of inclusive ablution areas [22] is highly desirable. It is recommended to find out the suitable dimensions of an ablution unit that insure comfort for Jordanian PHUWs. It should be added to BRCPD's next edition and applied to existing and proposed mosques. It is also recommended to consider the Indonesian standards mentioned in Yumadhika and Sholihah's study, which proposes a model for accessible ablution area [23] while keeping in mind that the tactile paving should be directed to the stairs, not to ramps [25].

The methodology and procedures followed in this study can be used to check the status of various mosques and Islamic Cultural Centers worldwide before upgrading and renovating them to become accessible to PHUWs.

REFERENCES

[1] A. R. Albasha, *Pictures from the life of the companions*, 1st ed. Beirut: Dar Al-nafaes, 1992.

[2] "Hijri Gregorian Converter." *IslamiCity*. https://www.islamicity.org/hijri-gregorian-converter/ (accessed August 12, 2022).

[3] A. Al-Sallabi, *Umar bin Abd Al-Aziz*, 1st ed. Cairo: Islamic publishing and distribution house, 2006.

[4] E. Sumarna, M. Parhan, M. Abdurrahman, J. Jenuri, G. E. Subakti, and Z. Zubir, "PEOPLE WITH SPECIAL NEEDS IN RELIGIOUS LITERACY," *Revista Iberoamericana de Psicología del Ejercicio y el Deporte*, vol. 17, no. 1, pp. 13-17, 2022.

[5] *The Building Requirements Code for the Disabled*, Amman, 1993.

[6] *Convention on the Rights of Persons with Disabilities*, UN, 2006.

[7] "United Nations Treaty Collection." United Nations. https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=IV-15&chapter=4 (accessed June 23, 2020).

[8] N. Al-Maani, "Greater Amman Municipality proceeds with the application of building requirements code for the disabled," in *Addustour,* vol. 15074, July 3, local section, p. 28, Amman: Jordan Press & Publishing Co., 2008.

[9] The Hashemite Kingdom of Jordan, *Law on the Rights of Persons with Disabilities,* Law No. 20, 2017.

[10] *Building Requirements Code for Persons with Disabilities*, Amman, 2008.

[11] S. A. Kadir and M. Jamaludin, "Users' Satisfaction and Perception on Accessibility of Public Buildings in Putrajaya: Access Audit Study," *Procedia - Social and Behavioral Sciences,* vol. 94, pp. 429-441, 2012, doi: https://doi.org/10.1016/j.sbspro.2012.08.047.

[12] *Regulation of mosques,* 95, 2004.

[13] O. Tutal, "Universal Access in Historic Environment and Accessibility of The Haci Hasan Mosque in Eskisehir," (in English), *Iconarp International Journal of Architecture and Planning,* vol. 6, no. 1, pp. 126-141, 2018, doi: 10.15320/iconarp.2018.41.

[14] H. Abu Tariah, N. Ghasham, M. Alolayan, B. Alahmadi, and A. Alqarni, "Wheelchair accessibility of mosques in Riyadh," *Work,* vol. 60, pp. 385-391, 2018, doi: 10.3233/WOR-182758.

[15] N. Al-Mansoor, "Universal Mosque/Masjid Design," in *Studies in Health Technology and Informatics*, *vol. 256*, *Transforming our World Through Design, Diversity and Education*, G. C. e. al., Ed.: IOS Press, 2018, pp. 293 - 298

[16] N. Utaberta, M. Dabbagh Niya, and A. Bin Sabil, "UNIVERSAL DESIGN AND ACCESSIBILITY FOR PEOPLE WITH DISABILITIES IN MASJID NEGARA, MALAYSIA," *Journal of Islamic Architecture,* vol. 4, no. 4, pp. 134-138, 2017, doi: 10.18860/jia.v4i4.4499.

[17] A. H. Mohamed, Y. A. Talib, and S. N. Haron, "Accessibility Assessment in the 'Masjid' for Persons with Disabilities (PwDs) using a Universal Design," in *International Conference on Architecture 2017 (ICRP-AVAN)*, Banda Aceh, Indonesia, October 18-19, pp. 160-167, 2017

[18] N. Mohd Shobri, I. Zakaria, and N. Salleh, "ACCESSIBILITY OF DISABLED FACILITIES AT FI-SABILILLAH MOSQUE, CYBERJAYA," *Malaysian Journal of Sustainable Environment,* vol. 4, p. 137, 2018, doi: 10.24191/myse.v4i1.5611.

[19] N. A. Abd Samad, A. A. Rahim, and I. Said, "Five Accessibility Challenges in Access Auditing Mosque Designs," (in English), *Environment-Behaviour Proceedings Journal,* Proceedings Paper vol. 4, no. 12, pp. 183-189, Dec 2019, doi: 10.21834/e-bpj.v4i12.1937.

[20] A. U. Mohamad Nazir, N. A. Ramli, M. R. Ismail, N. B. I. Rasli, S. Shith, and N. S. Zainordin, "Compliance of Water Closet Facilities in Mosques with Malaysian Standards, Guideline and Legislation," (in English), *International Journal of Integrated Engineering,* vol. 11, no. 2, pp. 1-11, 2019, doi: 10.30880/ijie.2019.11.01.001.

[21] G. Solihat and D. A. Himawanto, "The Accessibility of Places of Worship for Children with Special Needs: Study at the Campus Mosque in Surakarta," *International Journal of Recent Engineering Science (IJRES),* vol. 4, no. 6, pp. 17-20, 2017.

[22] S. Z. Dawal *et al.*, "Wudu' Workstation Design for Elderly and Disabled People in Malaysia's Mosques," (in English), *Iranian Journal of Public Health,* vol. 45, pp. 114-124, 2016.

[23] R. Yumadhika and A. Sholihah, "DESIGN OF MOSQUE ABLUTION AREAS FOR DISABLED: EVALUATION OF MINISTERIAL REGULATION OF PUBLIC WORKS AND PUBLIC HOUSING NO. 14/2017," *Journal of Architectural Research and Design Studies,* vol. 3, no. 1, pp. 10-23, 2019, doi: 10.20885/jars.vol3.iss1.art2.

[24] K. Tokuda, T. Mizuno, A. Nishidate, K. Arai, and M. Aoyagi, *Guidebook for the Proper Installation of Tactile Ground Surface Indicators (Braille Blocks): Common Installation Errors*. International Association of Traffic and Safety Sciences, 2008.

[25] T. Mizuno, A. Nishidate, K. Tokuda, and K. Arai, "Installation errors and corrections in tactile aground surface indicators in EUROPE, AMERICA, OCEANIA AND ASIA," *IATSS Research,* vol. 32, pp. 68-80, 2008, doi: 10.1016/S0386-1112(14)60210-7.

[26] "Islamic Cultural Center- Overview." http://centers.ju.edu.jo/ar/icc/Pages/Overview.aspx (accessed July 22, 2022).

[27] "Google Maps." https://www.google.com/maps/place/Mosque+of+the+University+of+Jordan/@32.0176411,35.8609064,16z/data=!4m5!3m4!1s0x151c9f76af472559:0x62d25ac6a316d8cf!8m2!3d32.0177355!4d35.8666531?hl=en (accessed August 4, 2022).

[28] H. Stetieh, "An evaluation of the School of Engineering buildings at the University of Jordan with regard to accessibility," *Sustainable Cities and Society,* vol. 42, pp. 240-251, 2018, doi: 10.1016/j.scs.2018.04.025.