

DEVELOPING CRITERIA FOR EVALUATIONS OF WATER CLOSET FACILITIES IN MALAYSIAN MOSQUES AND IT'S COMPLIANCE WITH STANDARDS, GUIDELINES AND LEGISLATION

***(MEMBANGUNKAN KRITERIA UNTUK PENILAIAN KEMUDAHAN BILIK
AIR DI MASJID MALAYSIA DAN PEMATUHAN PENILAIAN TERHADAP
PIAWAIAN, GARIS PANDUAN DAN UNDANG-UNDANG)***

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Abstract

Water closets generally provide general facilities, such as wash-hand basins, ablution areas, shower areas and water cubicles (including those for the disabled). This study seeks to developed a list of criteria for evaluation of the design of these ancillary components as defined in various Malaysian standards and guidelines relevant to water closet design, namely, Malaysian Standard MS 2577: 2014 (Architecture and Asset Management of Masjid – Code of Practice), Malaysian Standard MS 2015: Part 1: 2006 (Public Toilet – Part 1: Minimum Design Criteria), Malaysian Standard MS 1184: 2014 (Universal Design and Accessibility in the Built Environment – Code of Practice, Second Revision), JKR 1999 (Guidelines on Buildings Requirements for Disabled Persons) and UBBL: 1984 (Unit Building By-Laws – Part III: Space, Light and Ventilation). A five-point rating scale was developed for the access audit (1=not provided; 2=provided but below the recommendation; 3=provided and exactly as the recommendation; 4=provided but above the recommendation; 5=provided but not in the recommendation). The scores of every criterion were computed to determine the compliance percentage. The study was conducted in five mosques to assess the on-site and as-built compliance of their water closets.

Keywords: Access audit; accessibility; children; elderly; rating scale

Abstrak

Bilik air secara umumnya menyediakan kemudahan awam seperti sinki, kawasan wuduk, kawasan mandi dan bilik air bertutup (termasuk untuk orang kurang upaya). Kajian ini bertujuan untuk membangunkan satu senarai kriteria untuk penilaian reka bentuk komponen sampingan seperti yang ditakrifkan dalam beberapa standard dan garis panduan di Malaysia. Antara piawaian dan garis panduan yang berkaitan dengan reka bentuk bilik air ialah Malaysian Standard MS 2577: 2014 (Architecture and Asset Management of Masjid – Code of Practice), Malaysian Standard MS 2015: Part 1: 2006 (Public Toilet – Part 1: Minimum Design Criteria), Malaysian Standard MS 1184: 2014 (Universal Design and Accessibility in the Built Environment – Code of Practice,

Second Revision), JKR 1999 (Guidelines on Buildings Requirements for Disabled Persons) dan UBBL: 1984 (Unit Building By-Laws – Part III: Space, Light and Ventilation). Lima skala penilaian telah digunakan untuk audit capaian (1 = tidak disediakan; 2 = disediakan tetapi tidak melebihi cadangan; 3 = disediakan seperti cadangan; 4 = disediakan tetapi melebihi cadangan; 5 = disediakan tetapi tiada dalam cadangan). Peraturan pematuhan diperolehi berdasarkan skor yang dikumpul bagi setiap kriteria. Kajian ini telah dijalankan di lima buah masjid untuk menilai pematuhan tandas yang sedia ada dan yang telah dibina di masjid.

Kata Kunci: *Audit capaian; kebolehcapaian; kanak-kanak; orang tua; skala penilaian*

INTRODUCTION

Mosque design should sustainably demonstrate soundness in terms of design concepts, design requirements, design guidelines, scale and function (Abdul Rahim and Abdul Samad, 2014; Baharudin and Ismail, 2014). It should provide convenient spaces to all attendees, including the disabled, elderly and children. In addition to the main prayer hall, communal ancillary spaces, such as water closets that provide general facilities (e.g. wash-hand basin, ablution area, shower areas and water closet cubicles, including those for persons with disabilities), should be considered. Numerous studies focused only on water closet facilities for the disabled (Mamee and Sahachaisaeree, 2010; Dawal et al., 2016; Rahim, 2005; Ramli, 2017). Dawal et al. (2016) investigated the performance of *wudu'* (ablution area) for the disabled, especially those on wheel chairs, and suggested correct positions within the limitations of the disabled.

Conversely, facilities for the elderly and children have not been given ample attention. Ramli (2017) enumerated the physical features that are important in a mosque water closet for disabled are ramps, water closet facilities for the disabled and hand rails. In a public setting, the appropriate design for water closet bowls and wash-hand basins in public lavatories for disabled in Bangkok were studied by Mamee and Sahachaisaeree (2010) to determine the effectiveness of these facilities in terms of accessibility and usability. The authors found that the circulation areas and height of wash-hand basins are the factors that determine the appropriate design of public toilets.

However, not much information were reported for study that has been conducted on the comfort, safety and accessibility of different users of the general facilities in water closets in mosques, namely wash-hand basins, shower areas and cubicles. This non-residential water closet where, most designers neglect ancillary areas, such as water closet facilities, because they prioritise the aesthetic aspect of building design (Aman et al., 2017). Generally, a few guidelines have been set in Malaysian standards, related acts and by-laws for water closet design. Kadir and Jamaludin (2012) have conducted a study on the applicability of Malaysian standards and universal design to water closet facilities in public buildings. Abdul Rahim and Abdul Samad (2014), depicted that developed countries, such as Korea and Japan, have already achieved considerable progress in providing proper facilities, including the upgrading of water closets for the benefit of sanitary and users. Afacan and Gurel (2015) explored the demands, needs and expectations for water closets in Turkey and found that a sustainable design for public toilets must be based on familiarity, legibility, distinctiveness, accessibility, comfort and safety.

This study aims to assess the compliance of water closets in selected mosques by observing the on-site and as-built by design of all the facilities in mosque water closets, including facilities for the disabled, elderly and children against the prescribed guidelines. The results of this study could help designers and mosques managers to ensure that the facilities in mosques' water closets are aligned with the prescribed guidelines.

METHODOLOGY

Standard and Guidelines for Water Closet Facilities and Design

This work developed the assessment audit criteria of the ‘as built’ water closets condition at all Mosques based on the compliance levels to related Malaysia’s standards, guidelines and legislation. Although, there are available general methods that could be modified to suits the investigation scenario i.e. Gunawardana and Galadegara, (2013) for determining sanitation index, this study keeps the focus to local requirements in Malaysia.

Table 1 show the list of elements identified from standards, guidelines and legislation for the design of water closet facilities and includes the criteria that should be considered to provide friendly, comfortable and safe water closet facilities to users. Six criteria were selected for assessing water closet facilities and design according to standards, guidelines and legislation (Malaysian Standard MS 2577: 2014 (Architecture and Asset Management of Masjid – Code of Practice), Malaysian Standard MS 2015: Part 1: 2006 (Public Toilet – Part 1: Minimum Design Criteria), Malaysian Standard MS 1184: 2014 (Universal Design and Accessibility in the Built Environment – Code of Practice; Second Revision), JKR 1999 (Guidelines on Buildings Requirements for Disabled Persons) and UBBL: 1984 (Unit Building By-Laws – Part III: Space, Light and Ventilation)). These criteria were general facilities, wash-hand basin, ablution area, shower, water closet cubicles and water closet for the disabled. Forty elements of water closet facilities were considered to determine their compliance with the standards, guidelines and legislation for water closet facilities and design in mosques.

Table 1. Criteria and elements based on standards, guidelines and legislation

No	Criteria	Elements
1	General facilities	Water closet separation Water closet entrance/area, signage, water closet unit, floor condition, common facilities, ventilation and parental section Light level
2	Wash hand basin	Wash-hand basin unit, height of lower basin, wash-hand basin for children, width of basin, core end skirting, distance between basin, wash-hand basin traps and waste plug Height of top basin
3	Ablution area	Distance between water tap, height of water tap and water drainage channel
4	Shower	Shower units and robe hooks Shower area, gradient of floor, foldable seat, grab rails, shower head and soap dispenser
5	Water closet cubical	Water closet cubical area, door, floor condition, robe hooks, water closet bowl, water tap, tissue roll holder, trap floor, flush tank and sanitary disposal unit Window for ventilation Water closet disable separation Water tap
6	Water closet for disable	Water closet dimension, water closet bowl, tissue paper dispenser, soap dispenser, towel and dryer, mirror, wash hand basin, floor surface, door, grab rail, control devices and light level above wash hand basin Signage for disable

Access Audit of Water Closet Compliance

This study conducted access audits by evaluating ‘as built’ water closet according to required design and facilities. The access audit covered important criteria in determining the total percentage of

compliance of water closet design and facilities. According to Abdul Rahim and Abdul Samad (2014), access audit is performed by assessing existing buildings at a given point against the criteria set in Malaysian standards, guidelines and legislation. Access audits for disabled, can be divided into two categories: audits that assess the presence of facilities for the disabled and audits that assess the accessibility of the building for the disabled (Abdul Rahim and Abdul Samad, 2010). The observation and rating procedures were carried out using a checklist that was developed for assessing every element, accordingly. After observation, each element with a specific value was measured using measuring instruments, such as a measuring tape (Marksmen MS), Magnetic Protractor/Angle Locator (Johnson 700) and Laser Distance Locator (Bosch GLM30). The values were recorded and transformed into a specific score in a five-point rating scale, and the percentages of total score were computed to determine the level of compliance.

Rating Scale for Water Closet Compliance

The rating scale was used as the scoring method. Drawing from the study of Wright and Masters (1982), the rating scale method was adopted after outlining the requirements and establishing the rating scores that will represent the qualities of the measured criteria. Table 2 shows the rating scale used in scoring the elements in the water closets. A five-point rating scale was employed to assess the condition of the water closet facilities and the design (1=not provided; 2=provided but below the recommendation; 3=provided and exactly as the recommendation; 4=provided but above the recommendation; 5=provided but not in the recommendation).

Table 2. Details of rating score scale

Scale	Description
1	Not provided
2	Provided but below the recommendation
3	Provided and exactly as the recommendation
4	Provided but above the recommendation
5	Provided but not in the recommendation

Percentage of Water Closet Compliance

The compliance of each selected water closet was assessed by visualisation and communication with committee members of each mosque. This method allowed for the determination of the quality of the water closet facilities and the transformation of the data collected to obtain the total percentage of water closet compliance. In addition, the percentage of water closet compliance was obtained by scoring (rating scale) the condition of every element of the mosque, including the water closet. The scores of all the elements were computed to obtain the final percentage. Eq. (1) was used to compute the percentage of compliance on the basis of the assessment score (AS) and total score (TS) of each criterion.

$$\text{Percentage Compliance (\%)} = \frac{AS}{TS} \times 100(1)$$

The assessment score was calculated using the sum of the scores of all the elements of a criterion. The total score was the accumulated score of the water closet on the basis of the requirements obtained from the five national standards, guidelines and legislation.

RESULT AND DISCUSSION

General Observation on Water Closet Facilities

The general facilities in this study were investigated to determine if they provide all facilities, without exception, to all users, including those with disabilities, the elderly and children. Seymour and Hughes (2014) indicated that the implementation of improved sanitation is not indicative of overall higher user satisfaction levels. Generally, well-provided facilities were difficult to satisfy

overall users because the disparity of the level of awareness among community members or the users. Ramli (2017) interviewed a few water closet users in mosques, and the answers showed a lack of consensus. In essence, general facilities should include water closet separation, water closet area, signage, water closet unit, floor condition, common facilities, light level, ventilation and parental section. A parental section should be provided to help users ensure the cleanliness of their child before entering the main prayer hall. However, none of the mosques provided it. By contrast, ventilation was present in all the selected mosques. As shown in Figure 1, windows and block openings on walls provided sufficient ventilation.



Figure 1. Well-built ventilation

With regard to wash-hand basins, all mosques had moderate-condition wash-hand basins, and none of the elements was ignored. Two types of wash-hand basins were used in all of the selected mosque i.e. isolated or connected by bench. Figure 2 shows the different types of wash-hand basins. The wash-hand basins did not fully comply with the following requirements stipulated in national standards, guidelines and legislation: the number of basins should be equal to the number of water closets provided, the height of the top basin must be 700–800 mm, the height of the lower basin should be 550 mm, the width of the basin must be 600 mm, the minimum height of the core end skirting must be 100 mm, the distance from the centres of adjacent basins should be 850 mm, a wash-hand basin for children should be provided, and the basins should have chromed brass P traps without a waste plug.



Figure 2. Types of wash-hand basins and a wash-hand basin for children

As mentioned previously, the ablution area is an important component of any mosque and should be placed at a point that can be easily seen and reached. In this study, the ablution area in the water closets was only considered as a part of the water closet. However, the condition of the ablution area might be different from the criteria recommended by MS 2577: 2014 because numerous elements did not meet the requirement especially the tap height and water drainage channel. Figure 3 shows the current condition of the ablution areas. Apparently, the ablution areas in certain mosques presented a barrier for the disabled and elderly because the height of the water tap is less than 1 m from the floor. Water drainage channel was another frequently ignored element.

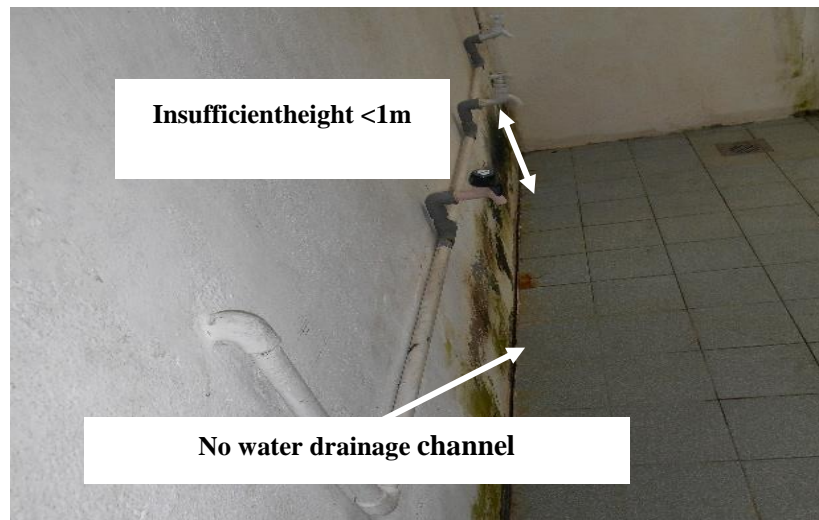


Figure 3. Ablution area condition in certain mosques

The shower area is another important criterion of water closet facilities. According to MS2015: Part1: 2006, a shower should be provided to meet the expected demand. However, two out of five did not have such a provision. Furthermore, a shower area should have sufficient facilities, such as robe hooks, foldable seat; grab rails, shower head and soap dispenser. None of the selected mosques provided grab rails and foldable seats. Figure 4 shows the shower conditions in half of the selected mosques that did not have foldable seats, grab rails and soap dispensers.



Figure 4. Shower conditions in one of the selected mosque.

The water closet cubicle and water closet for the disabled are classified as self-containing fully enclosed spaces for defaecation and urination. According to MS 2015: Part 1: 2006, the water closet cubicle and water closet for the disabled should contain sufficient sanitary fixtures and elements because these facilities are important in maintaining a hygienic environment. Difficulties in accessing and using these facilities are a major issue, especially for the disabled, elderly and children. Water closet cubicles should have sufficient elements, including water closet cubicle area, door, floor condition, robe hooks, water closet bowl, water tap, tissue roll holder, trap floor, flush tank and sanitary disposal unit, each of which should comply with national standards, guidelines and legislation. However, the water closet cubicles in the selected mosques were of moderate condition, and none of the mosques provided a sanitary disposal unit either in the water closets for males or females. Figure 5 shows the condition of the water closet cubicles in the mosques.



Figure 5. Different type of Water closet cubical

The water closet for the disabled was considered insufficient in this study because four of the selected mosques did not provide facilities. This finding is consistent with the assertion of Aman et al. (2017) that most designers neglect ancillary components, such as water closet and ablution area, and these components are inaccessible to unable-bodied users, such as the disabled, elderly and children. Only one out of five mosques selected met this criterion (Figure 6). The elements were sufficient, even though signage and tissue paper dispenser were not provided.



Figure 6. Condition of the water closet for the disabled

These results also agree with the statement of Ramli (2017), who asserted that the right of person with disabilities are being ignored because mosque management lack awareness on this issue. Measures should be implemented to ensure that persons with disabilities are given equal access to the physical environment, transportation, information, communication, technologies, facilities and services either in urban or rural areas (United Nations, 2006).

CONCLUSION

Access audit was conducted in this study to investigate the compliance of mosque water closets with five national standards, guidelines and legislation. In this study, the six criterion of the water closet, which are ancillary areas, were selected for assessment. General observations results indicate that the provisions of water closet facilities in the studied mosques did not fulfill the national standards, guidelines and legislation. This may be due to the lack of awareness on the requirements for water closet facilities and less attention has been given to it. Perhaps focus were given more on the aesthetic feature of the most visible and attractive parts of mosques design and built-up.

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