Accessible Built Environment for the Elderly and Disabled in Malaysia: Hotels as Case Studies

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Abstract: In Malaysia, it has become of increasing importance to study ways to improve the level of accessibility in buildings for the elderly and disabled people in the built environment, especially in hotels and resorts. The methods used in this study to identify areas to improve are access audits, table research and interviews. The data from these studies are analysed using a descriptive analysis based on access audits, observations, plan analysis, photographs and questionnaires. Access audits were carried out in two hotels and resorts in July and November 2007 in selected areas of East Malaysia. The selected hotels and resorts were constructed in the 1980s; one is located at the countryside and the other in the city centre. The findings will allow the building provider to upgrade existing facilities in order to accommodate accessible built environment for the elderly and disabled people. This will allow the elderly and disabled people to move freely, safely and being more easily integrated with the society in areas of public building and public spaces.

Keywords: Accessibility, Built environment, Access audit, Disabled, Hotel

INTRODUCTION

Justification of the study

In Malaysia, several studies related to the elderly population have been performed, but none of the studies are related to accessibility in the built environment.

The objective of this study is to focus on the issue of accessibility for the elderly and disabled people in accessing hotels and resorts in Malaysia for the following reasons:

a) Based on the interviews and observations that were performed during data collection process, the tourists are categorised as middle-elderly and older-elderly groups (40–60 years old). Because of this, it is important that the government, non-government organisations (NGOs) and those who are involved in providing the

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facilities, accommodations and other services related in tourism to conduct access audit.

b) Ageing is related to the term "Persons with Disabilities" (PWDs). In Malaysia, the star ranking for disabled persons in hotels and resorts has not been introduced as widely as it has been practiced in Australia. As a developing country, Malaysia should take the necessary measures to implement a similar system as practiced in developed countries.

c) In achieving accessibility in the existing hotels and resorts built environment, it is to ensure that the facilities meet the needs of the elderly and disabled tourists.

BACKGROUND

Malaysia achieved independence in 1957 and has committed itself to improve both economic growth and the human aspects of development. This is aligned with Malaysia's Vision 2020, which aims to attain the status of a fully developed nation with equal emphasis on enhancing the well being and social stability of the people and the establishment of a fully caring society. Malaysia's policies and programmes for the disabled citizens of the country are guided by the strategic goals of the National Welfare Policy, which emphasises on the attainment of self-reliance, equalisation of opportunities for the less fortunate and fostering of the spirit of mutual help and support towards enhancing a culture of caring (Ismail, 2003).

According to the statistics provided by the World Health Organisation (WHO), it is estimated that 5–10% (1.3–2.6 million) of the world's population are PWDs. As reported by the Department of Statistics Malaysia, the total population of Malaysia in 2006 was 26.64 million people. Of the total population, 1.3–2.6 million are PWDs. However, as of December 2007, only 220 to 250 PWDs were registered with the Social Welfare Department. This number is predicted to rise along with the increasing population, lifespan and the total number of road and industrial accidents. The total number of the elderly population in Malaysia is expected to increase from 1.73 million (6.6%) in 2005 to 3.8 million (11.3%) in 2020 (Social Welfare Department, 2007).

In the work of Kose (2001, p.17), 'The Impact of Aging on Japanese Accessibility Design Standards' states that Japan has the fastest growing ageing population. By 2015, more than 25% of the country will be over 65 years of age and the Japanese government has developed design guidelines to accommodate these changes'. Because Malaysia is also entering the ageing population category, the government must also enforce guidelines to prepare for the changes.

Consequently, the Malaysian government has signed the 'Proclamation for Full Participation and Equal Opportunities for the Disabled Persons in the Asia & Pacific Region' in 1994 and also agreed to implement the 'Biwako Millennium Framework For Action: Towards An Inclusive, Barrier-Free And Rights- Based Society For Persons With Disabilities In Asia And The Pacific' (2003–2012) (UN ESCAP, 2007) as guidelines for the development of the PWDs in Malaysia.

The "Convention on The Rights of Persons with Disabilities" was adopted on December 13, 2006, during the 61st session of the United Nations General Assembly. In the Convention on The Rights of Persons with Disabilities, Article 9, emphasises accessibility, i.e., to enable PWDs to live independently and participate fully in all aspects of life. Article 9 also reported that state parties shall take appropriate measures to ensure that persons with disabilities have access to, on an equal basis with others, the physical environment, transportation, information and communications, including information and communication technologies and systems and other facilities and services open or provided to the public, both in urban and in rural

A study by Wijk (2001, p.28.1) 'The Dutch Struggle for Accessibility Awareness', recounts the failed results in the Netherlands of separate accessibility requirements in influencing designers and builders. Subsequent efforts produced some improvements, but he questions requirements and labels that give designers the excuse to marginalise the needs of diverse users. He illustrates the continuing gap between what is built and what all people need and he proposes changes in the professional educational process as one approach to obtaining a level of design that is acceptable for everyone. Meanwhile, in his writings of Bringa (2001, p.29.1) 'Norway's Planning Approach to Implement Universal Design', he explains the new approach of the Ministry of the Environment to develop a high-level strategy that would introduce accessibility as a goal in planning to overcome fragmented, poorly coordinated technical approaches. At least one of these approaches should be realised to attain a barrier-free design.

DEFINITIONS OF TERMS

The following are definitions extracted from the Malaysian Standard MS 1184:2002, Code of Practice on Access for Disabled Persons to Public Buildings.

1. **Access for disabled persons** is defined by a continuous unobstructed path of travel to or within a building capable of being negotiated by a person using a wheelchair or otherwise with limited mobility.

2. **Disabled persons** refer to people with a physical, hearing or visual impairment or any combination thereof, which affects their mobility or their use of buildings and related amenities.

3. **Wheelchair users** are persons who depend on a wheelchair for mobility. These include attendant-propelled wheelchairs, powered wheelchairs and self-propelled wheelchairs.

DISABILITY AWARENESS

To create a fully accessible environment, it is important to understand the nature of the access requirements of diverse disability groups. For the purpose of built environment design, there are typically four major disability groups:

1. Orthopaedic: ambulant and non-ambulant (wheelchair users);

2. Sensory: visual, hearing;

3. Cognitive: mental, developmental and learning

4. Multiple: combination of any or all of the above

Orthopaedic

People with orthopaedic disabilities are generally those with loco-motor disabilities, which affect mobility. This can mean impairment of the trunk, lower limbs or both.

Sensory

People with sensory disabilities are those who, as a consequence of visual or hearing impairment, may be restricted or inconvenienced in their use of the built environment. They are divided into two subgroups, (1) visually impaired/blind and (2) hearing impaired.

Cognitive

People with cognitive disabilities are generally those with a mental illness, such as a developmental or learning disability. Creating a building plan that is easy to understand is important.

Multiple

People with multiple disabilities are generally those with combination of orthopaedic, sensory and/or cognitive disabilities. Therefore, structures and their surrounding built environment must incorporate a combination of visual,

tactile and olfactory cues to assist them in the use of their surroundings.

Recently, the author has performed studies related to accessibility in various types of building types in Klang Valley. Abdul Rahim (2001b) identified continuous access for an outdoor pedestrian walkway, along Jalan Raja Laut. Kuala Lumpur was identified, to some extent, to be difficult to be use for wheelchair users due to drops and inappropriate slopes on ramps. In another case, Abdul Rahim (2007a) indicated that accessibility inside hospital buildings was determined to be accessible, simple and easy to move about. People on wheelchairs were able to wheel to various destinations without any problems, such as the lobby area, registration counter, doctor's room, cafeteria and toilets, except that there were no specific parking areas for the disabled. Additionally, visually impaired and hearing impaired people reported of easy access.

A further study by Abdul Rahim (2008) regarding an access audit for an existing high rise office building constructed in the 1980s revealed some difficulties in the access to toilet facilities for wheelchair users. However, management then took a proactive approach by renovating and converting some levels/storeys in the office building to contain accessible toilets. That study proposed having available a receptionist who was able to use sign language. Another contribution of Abdul Rahim's (2006) was to access audit school buildings for both secondary and primary to make them inclusive that was done in 2006 in Putrajaya for children in wheelchairs by proposing to renovate the schools to improve and upgrade existing facilities

METHODOLOGY

Access Audit

Access audit, as a structured approach to accessibility, results in information that can lead to improvements (which would not have occurred by using an ad-hoc approach) and opportunities that reduce overall cost improvements (which causes them to be more affordable).

As mentioned by Holmes-Siedle (1996, p.9), access audit gives a 'snapshot' of an existing building at a given point in time. The snapshots are a useful starting point in assessing the current state of accessibility and usability of existing buildings. An access audit examines an existing building against predetermined criteria designed to measure the 'usability' of the building for disabled people. Usability ranges from getting in and around to exiting the building. Depending on the measurement criteria, the

assessment examines the percentage of the facilities that can be used independently by disabled people.

A study by Holmes-Siedle, (1996) indicated that audits should be performed by experienced auditors who have been involved with and working with disabled persons. To produce an adaptive survey, the surveying and reporting team should be experienced in the design of buildings for disabled people and the process required for their implementation. Therefore, it is likely that these types of groups will include disabled people and architects experienced in adaptive work.

Access audit falls into two different categories: (1) audits that access the presence of facilities for disabled persons and (2) audits that are designed to assess how well the facilities in the building will work for disabled people.

Procedure to Conduct Access Audit with Disabled Persons

This research applied access audit conducted by experts along with the involvement of disabled persons representing each disability, including those with vision impairments, hearing impairments, wheelchair users and people using crutches. It is important to have participation from each of the four categories of disabled persons to obtain accurate data in identifying and recording the problem while assessing and using the facilities provided.

1. Determine the zoning of areas to conduct the access audit.

The background of the site was identified before conducting the access audit on site. The layout plan of the entire site or the building plans were obtained to distinguish the zoning and the route was visited during the access audit. It is recommended to conduct a pre-visit to the site to become familiar with the area selected for the access audit exercise.

2. Appointment and arrangement with the disabled persons and other relevant bodies and authorities.

Arrangement with the disabled was done before the access audit was conducted. The social welfare department from each state was contacted to assist in allowing the disabled users to be involved during the access audit.

3. What to audit?

The audit considered both physical features and issues of management and use. For this research, an existing access audit checklist was adapted, edited and adopted to suit local context and demands covering inside and outside

building aspects that involved the following topics (see Table 1).

Table 1. Criteria to be audited

External environment	Parking
	Taxi stand
	Pathways
	Kerb Cuts
	Pedestrian Crossing
	General Obstruction
Internal Environment	Main entrance
	Doors
	Corridors
	Elevator/ Lifts
	Steps/ stairs
	Ramps
	Handrails
	Toilets
	Eating Outlets
	Public Telephones
	Resting Facilities
	Reception and Information Counters

Source: Research.

Equipment Used for the Access Audit

1.   Measuring tape

Measuring tape was used to determine the existing size of the facilities. The data obtained from a measuring tape shall be used for a comparison between the required measurement and the provided measurement to determine whether or not it complies with the standard.

2.   Wheelchairs

There are two main categories of wheelchairs: conventional and motorised. Both types of wheelchairs were being used during the simulation.

3.   Gradient modelling and levelling

To ensure that each ramp exhibited a slope in accordance with the standards, levelling was performed along with gradient modelling to determine the slope level of the ramp. The gradient modelling that was used during the access audit was provided in four ratios, 1:8, 1:10, 1:12 and 1:14. Ramps that are constructed with slopes of 1:10, 1:8 or steeper are not safe for wheelchair users.

Figure 1. Using gradient model and levelling to measure the slope
of the ramps
Source: Research.

4.   Sketchbook

Sketchbooks were used to record data manually by drawing the conceptual diagram of movement as well as recording measurements and problems that were identified via observation.

5.   Camera / video camera / digital camera

6.   Expert groups

The expert groups participated in the access audit from the disabled groups such as the wheelchair users, hearing impaired, visually impaired and the physically disabled/elderly people.

7.   Checklist

The checklist was completed by individual researchers.

Unstructured Interview

An unstructured interview was conducted on disabled groups who participated in the access audit.

Preparing the Report

After the audit was conducted, the researchers proceeded to write the audit report. As discussed by Sawyer and Bright (2004), in preparing the audit report, it is essential to consider the purpose of the audit and for whom it is designed. It is critical that the information is presented in a way that will allow the reader to make the best use of it. The report shall describe the building or environment and the current access situation, recommended access improvements, prioritise actions, give costs and indicate where improvements can be made through a maintenance programme or by management action.

ANALYSIS

Two case studies were performed in two five-star hotels in East Malaysia; both were constructed in the 1980s. Case Study A was an international resort hotel partly located in a hilly area in the country and another facing the open sea (waterfront development) and Case Study B was a five-star hotel located in an urban area. It was built in 1985 with 315 rooms of three different layouts.

Case Study A

An access audit was performed in June 2007 for existing building and facilities. This resort began operations in 1984 and has performed major additional work and added units as well as upgraded some of the facilities to accommodate tourists and guests who are disabled and elderly. The interview held with the management level indicated that two-thirds of the guests were group guests and most of them were foreigners, including pensioners from Europe and developed countries. Only one-fourth were local tourists. The disabled and elderly tourists typically come with their family members. The foreigners tended to be between 40 and 60 years old.

Local visitors typically arrive during school holidays and during weekdays for meetings and seminars/conferences. Foreigners typically come in groups or with family members. The hotel is mostly occupied by foreigners during the weekends. During the construction of the building, facilities for the PWDs were not considered in the earlier design because there was no enforcement by the authorities; additionally, the Malaysian standards for disabled persons were not yet introduced.

Summary

From the above findings, Case Study A was quite accessible for the PWDs. The flow of the accessible area was controlled; accessibility in this controlled area provides continuous mobility to important areas of the resorts both inside and outside of the building. However, more facilities will be provided for this group of tourists in the future, including flashing lights in the bathroom and bedroom for the hearing impaired and tactile warning surfaces and Braille for visually impaired people. Some recommendations for improving the facilities for the disabled at the resort include providing accessible parking spaces of an appropriate size, widening the restroom door from 760 mm to 900 mm and having at least two units of the chalet provided with proper ramps for wheelchair users. The existing ramp provided at the chalet is too steep and

dangerous for a wheelchair. Overall, the building is accessible with recommended minor upgrades.

Case Study B

For Case Study B, the hotel has 13 floors and 29 rooms per floor. Every level contains three different room designs. Total of 23 standard rooms (two double-beds, one twin-bed), deluxe rooms (two units) and a suite room (four units). The swimming pool is located on the 2nd floor. The 12th floor is designated as an eating area. According to the interviewee, the facilities for the disabled were not fully provided. However, due to the demand of users, especially wheelchair users and the ease of transporting of luggage, a ramp at the main entrance is provided at an appropriate gradient.

However, due to the demand of users, especially wheelchair users and the ease of transporting of luggage, a ramp at the main entrance is provided at appropriate gradient. The findings indicated that Case Study B did not provide any accessible rooms for the disabled. All of the bathrooms in the different bedroom layouts are inaccessible by wheelchair users due to the width of the bathroom doors, which was 750 mm and the wheelchair users found it difficult to manoeuvre.

It is recommended to the management to renovate at least two units of rooms for disabled guests. The facilities must consider the needs of the wheelchair users, visually impaired persons and hearing-impaired persons. This can be achieved by providing sizeable toilets to accommodate wheelchair users and flashing lights in the bathrooms and bedrooms for the hearing impaired. Tactile warning surfaces and Braille should be provided in the bathroom for the visually impaired. All of the door knobs should be the lever type.

Table 2. Access Audit Elements in Hotel - Case Study A

ELEMENT	DESCRIPTION OF EXISTING FEATURES	PROPOSAL / RECOMMENDATION
PARKING Figure 2. Accessible parking provided for the disabled with mobile signage.	**Wheelchair User** - Mobile signage for parking. - It is visible, but because it can be moved, the parking might be taken by other people.	- Fixed standing signage to indicate accessible parking is recommended. Figure 3. Example of small signboard to indicate accessibility for disabled parking.
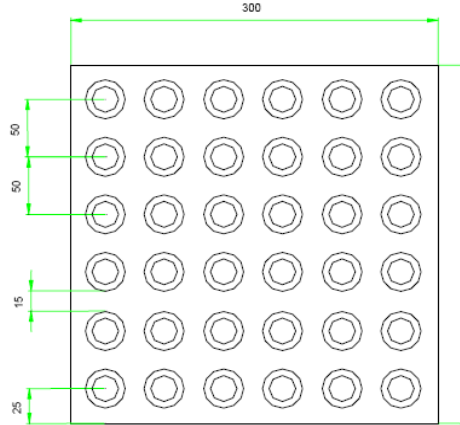
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Table 2. *(continued)*

ELEMENT	DESCRIPTION OF EXISTING FEATURES	PROPOSAL / RECOMMENDATION
ENTRANCE **(FROM MAIN LOBBY TO SWIMMING POOL AREA)** Figure 4: The steep ramp is not easy to use for wheelchair users.	**Wheelchair User** - Swimming pool area is difficult to be reach due to a steep ramp with a 1:7 gradient ratio. The wheelchair users require assistance to reach the swimming pool areas. **Vision Impaired** - Tactile warning surface is not provided at the edge of the steps.	- Existing steep ramp should be adjusted to 1:12 gradient with railing on both sides and provided with a 100 mm kerb at the edging. - To provide a tactile warning surface at the edge of the steps and at the beginning of the ramp for visually impaired people.
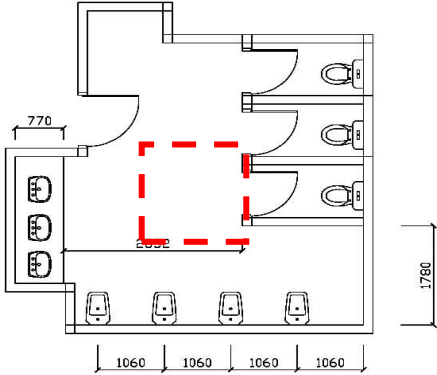
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Table 2. *(continued)*

ELEMENT	DESCRIPTION OF EXISTING FEATURES	PROPOSAL / RECOMMENDATION
MAIN ENTRANCE Figure 5. The ramp is too steep and disabled or elderly people often require assistance from others.	**Wheelchair User** - Ramp at the entrance is not provided at an earlier stage of the design, the current ramp has a 1:10 gradient and is primarily used to bring luggage in and out of the hotel. A wheelchair user cannot wheel his/her wheelchair by himself/herself. Assistance is required in this area. **Vision Impaired** The steps at the main entrance are not equipped with tactile warning surfaces at the edges or nosing with different coloured tiles to indicate edges for visually impaired people.	- The ramp should be redesigned and reconstructed to achieve a gradient ratio of 1:12. Figure 6. Proposed tactile warning surface. Source: Research. Provision of tactile warning surfaces at the edge of steps is recommended.

Source: Research.

Table 3. Access Audit Elements in Hotel - Case Study B

ELEMENT	DESCRIPTION OF EXISTING FEATURES	PROPOSAL / RECOMMENDATION
PUBLIC TOILET Figure 7. Signage for the disabled toilet is not included.	**Wheelchair users** - Located at the lobby area. No signage for the disabled. a) Male toilet - Male toilet is accessible. Space is large enough to manoeuvre. The size is acceptable. There is railing installed and accessible to the urinal. An appropriate washbasin height with a 600 mm door clearance is provided.	- One unit for PWDs in the male toilet and female toilet, each near the restaurant, is proposed. - Install tactile warning surfaces at the entrance of the wheelchair and attach signage for the disabled. Figure 8: The proposed area for accessible toilets to be located within the existing male toilet at the ground floor.

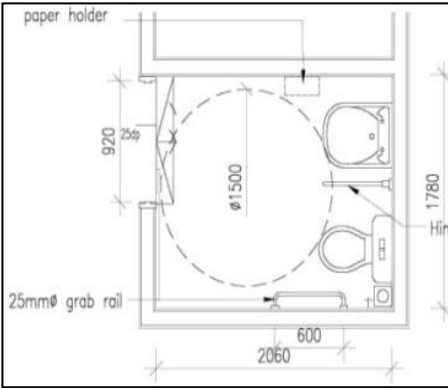*(Continued on next page)*

Table 3. *(continued)*

ELEMENT	DESCRIPTION OF EXISTING FEATURES	PROPOSAL / RECOMMENDATION
Figure 9. Wash basin at the proper height with adequate knee space under the countertop.	b) Female toilet - The female toilet is accessible, but railing is not provided inside of the toilet area. The sink counter is acceptable and is accessible to the water tap. The hair dryer is accessible except that the tissue paper discharger to wipe the hands is not accessible. **Vision Impaired** - The label for gender is not embossed. This creates difficulties for visually impaired people to identify the toilet.	Figure 10. Proposal of accessible toilet to be inserted in the male toilet. - The signage should be able to be identified by the visually impaired people whether it is deeply embossed or engraved, or the signage should include Braille for easy identification.

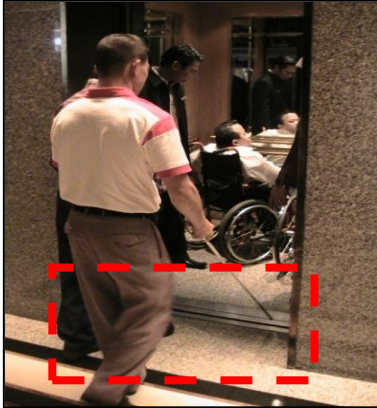*(Continued on next page)*

Table 3. *(continued)*

ELEMENT	DESCRIPTION OF EXISTING FEATURES	PROPOSAL / RECOMMENDATION
ELEVATORS / LIFTS Figure 11. Call button is within reach for wheelchair users.	**Wheelchair User** - The buttons are accessible by wheelchair users. The call button is 1200 mm from the floor level. - Handrails mounted on three sides of the lift at a height of 800 mm from the floor level with a 40-mm diameter. **Vision Impaired** - Four talking lifts are provided. - Braille for the blind is not provided but it is embossed. - No tactile warning surface installed in front of the lifts. - Control panel is not installed with Braille (Height = 800 mm)	- A tactile warning surface and Braille should be provided in front of the lift and Braille for visually impaired people. Figure 12. Proposed location for the installation of tactile warning surfaces.

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Table 3. *(continued)*

ELEMENT	DESCRIPTION OF EXISTING FEATURES	PROPOSAL / RECOMMENDATION
HOTEL ROOM Figure 13. Wheelchair users entering the room.	**Wheelchair Users** - The room is accessible. Unfortunately, the door width at the toilet is too narrow for wheelchair users. There is a threshold of 1 inch before entering the toilet. Circulation area is acceptable. However, it is difficult to obtain access for wheelchairs and is impossible to enter the shower. The bath tub is also inaccessible. - Toilet door is too narrow (750 mm)	- Increase the door width at the toilet from 760 mm to 1000 mm. - Remove the threshold at the main entrance door for wheelchairs. - Remove the glass door, provide a curtain and remove the threshold at the shower area. - Shower door opening should be 1000 mm wide.
Room 521 (Standard Double Bed) Figure 14. The occurrence of 1-inch threshold towards the shower areas.	**Wheelchair Users** - The room is accessible, but the toilets are inaccessible by the wheelchair users. - 1-inch threshold obstructs wheelchair users upon entering the toilet.	- The standard room is not recommended for the wheelchair users. - To create drop that is lay to fall at threshold area.

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Table 3: *(continued)*

ELEMENT	DESCRIPTION OF EXISTING FEATURES	PROPOSAL / RECOMMENDATION
Room 527 (Suite) Figure 15. The toilet door is too narrow.	- The suite is accessible with a spacious toilet, but the entrance is too narrow and obstructed by a 1-inch kerb at the door entrance.	- To provide at least two accessible units for the disabled (10%) - two units for deluxe and four units for the suite. - Modify the toilet accordingly.

Source: Research.

CONCLUSION

The data were analysed by using a descriptive analysis based on access audit, observation, plan analysis and photographs. From the analysis and findings, similar problems were identified for all of the selected case studies. The following are the problems that consistently appeared in the case studies:

1. For wheelchair users

Their mobility to certain spaces is limited due to barriers such as steps or a threshold occurred normally at the entrance. For certain cases such as entrances and loading areas, where a ramp is provided, they could not use the facilities because of a steep ramp or inappropriate gradient. All of the ramps discussed in the case studies are not in accordance with MS 1184, which recommends that all ramps should be constructed with 1:12 ratio. The ramps measured in the case studies are typically a 1:8 ratio or 1:10, which are primarily used to bring luggage in and out of the hotel.

2. For visually impaired persons

The mobility of visually impaired people is not secure enough due to the lack of tactile warning surfaces provided by the building management. Dangerous areas, such as the edges of steps, are not equipped with tactile warning surfaces. A warning block should be provided at the front of steps and landing for visually impaired people.

Visually impaired people may not be aware of the change of level at the staircases and they may fall because no indicators are provided for them. Glass doors or glass walls should be marked with a colour band with a contrasting colour at eye level to keep visually impaired people from hitting the glass walls. There are some cases in which visually impaired people were injured because they were not aware of the existence of the glass door and they accidentally hit the glass wall and lacerated their foreheads. Tactile warning surfaces should be installed in major routes for visually impaired people. Guiding blocks are not as crucial as warning blocks because they might require somebody to assist visually impaired people. Hence, it is sufficient to have warning blocks rather than having both guiding and warning blocks in the buildings.

3. For Hearing-Impaired Persons

To assist hearing impaired persons, flashing lights should be installed in their bathroom and bedroom to indicate an emergency situation because hearing impaired persons cannot hear an emergency signal or if anyone is knocking on their door. Flashing lights could help notify hearing impaired people of visitors.

The trend of accessibility of the case studies varies from one case study to another, depending on a number of factors such as the date of construction, the awareness of the building providers and the professionals involved, the purpose of the buildings and the expected needs of the users of the buildings. Therefore, access audit is an important technique to identify problem areas with access for the disabled on existing buildings so that the owner or building providers can perform upgrades and renovation to accommodate accessibility. Future developments should consider continuous accessibility from the inside to the outside of buildings and accessibility should be provided in all of the building types such as resorts, recreational areas, schools, shopping complexes, office buildings, transportation, airports, ports, religious buildings and others.

In the case that it is not possible to provide access in an area for disabled persons in wheelchairs due to site constraint or the costs of upgrading, it is advisable to have staff available to assist disabled people. For example, in the reception area, there should be a notice displaying a message such as, "If you require assistance please ring the bell, or there is a disabled logo area at the counter in the reception area." The receptionist should be multi-functional and able to communicate by using sign language.

It is expected that the findings in this study will assist the building provider in upgrading existing facilities to accommodate the accessible built environment. This will allow elderly people and people with disabilities to move freely and safely and should allow elderly and disabled persons to be more easily integrated into society.

According to the research conducted in this study, the primary finding that can be addressed is the deficiency in facilities provided for disabled persons, especially for wheelchair users and visually impaired persons either inside or outside buildings. Access audit is a tool to assist the building management in identifying if there are problems with respect to size, specifications and facilities that are not appropriate for disabled and elderly areas of tourism and are planned to be included during upgrading stages at those identified accessible areas in the future.

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