Application of Universal Design in the Built Environment

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PREFACE

The objective of this book is to disseminate information related to what is access audit, why carry out an access audit, access survey and the process of implementing it in built environment specifically to our existing buildings. It also to inform the public especially professional in the building industries such architects, engineers, planners, landscape architects, contractor, technical people from the local authorities, administrators and politician the importance of providing access in our built environment continuously in a seamless journey inside and outside buildings. This book will further disseminate information regarding access audit to built environment, explain on the procedures in accessing a building and to do the checklist on how to analyze an access audit.

This book will discuss on available code of practice for the people with disabilities and design guidelines. Persons with disabilities shall have the right to access to use facilities, amenities, services and public building which was open or provided to equality with people on the basis of disability, but subject to the existence or emergence of any situation that may endanger the safety of persons with disabilities.

This book focusing on various available regulations, guidelines, Acts and Malaysian Standards that have been used in most local authorities in Malaysia in order to provide facilities for the people with disabilities in Malaysia

ACKNOWLEDGEMENTS

In the name of Allah, Most Gracious, Most Merciful

In 2008, KAED Universal Design (KUDU) was given a grant by Ministry of Women, Family and Community Development of Malaysia to do a research on the access audit for disabilities to public building in Malaysia. The studies were carried out in sixteen different sites throughout Malaysia. The chapters that to be discussed fulfilling building typology such as waterfront development, communal area, transportation and jetty, and parking area

Special thanks goes to researchers as well as contributors for this book. Appreciation and gratitude addressed to the former Rector of IIUM, Prof. Dato' Sri Dr. Syed Arabi Syed Abdullah Idid and the Dean from Kulliyyah of Architecture and Environmental Design (KAED), Prof. Sr. Dr. Khairuddin Abdul Rashid for their support and assistance. Special thanks go to directors of KAED, Universal Design Unit (KUDU), IIUM, for their initial financial and moral support.

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CHAPTER 1:
UNIVERSAL DESIGN AND ACCESS AUDIT

Asiah Abdul Rahim and Nur Amirah Abd Samad

UNIVERSAL DESIGN

Universal Design is defined as the design of products and environments to be usable by all people, to the greatest extent possible, without adaptation or specialized design. Universal design however is concerned with more than just removal barriers. It seeks to eliminate discrimination by design and support full social participation for all members of society.

According to Follete (2002), Universal Design is intended to be inclusive not exclusive. Universal design is the idea that everyone should have access to everything all of the time and the impact it has had on the design of the home, workplace, transportation, communications, computers, furniture, products and services to meet the needs of as large audience as possible.

Universal Design is trans-generational design – design for grandfather as well as for grandchild. It is not designing within the vacuum of self. According to Steinfield (2002), universal design is defined as the design of products and environments to be usable by all people, to the greatest extent possible without adaptation or specialized design. The universal design is accompanied by and linked to a set of seven principles. The intention is that the seven principles may be applied to evaluate existing designs, guide the design process and educate both designers and consumers about the characteristics of more usable products and environments.

PRINCIPLE OF UNIVERSAL DESIGN

The seven principles are as follows:

i) **Equitable Use:** The design is useful and marketable to people with diverse abilities.

ii) **Flexibility in Use:** The design accommodates a wide range of individual preferences and abilities.

iii) **Simple and Intuitive Use:** Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills or current concentration level.

iv) **Perceptible Information:** The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

v) **Tolerance for Error:** The design minimizes hazards and the adverse consequences of accidental or unintended actions.

vi) **Low Physical Effort:** The design can be used efficiently and comfortably and with minimum of fatigue.

vii) **Size and Space for Approach and Use:** Appropriate size and space is provided for approach, reach, manipulation and use regardless of user's body size, posture or mobility.

In summary, universal design is defined as 'the design of product and environment to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design' (The Center for Universal Design, 1997).

Many researchers reported that there are six essential requirements of good design which include safety, accessibility, usability, affordability, sustainability, and aesthetics. In order to achieve universal design, the following concepts have been applied such as adaptation, assistive technology and manpower resources should be considered.

Universal Design can be obtained only by working from the bottom up, by looking to make normal provisions suitable for everyone. It aims to be socially inclusive and is compromised "accessibility" is defined in terms of provision for people with disabilities. In United Kingdom, United States and developed countries around the world, statutory controls

for making public buildings accessible to people with disabilities have been beneficial; whatever their short-comings, they have been instrumental in massively extending the accommodation parameters of the generality of public buildings. The downside is that the universal design ideal remains elusive. Figure 2 below shows the category of users which comprise of 1 to 8, on the hand, the designers, architects and professionals in the built environment, are located in the rank A, B, C and D. D is considered the best covering the range of users from 1 to 8, see Figure 1.1.

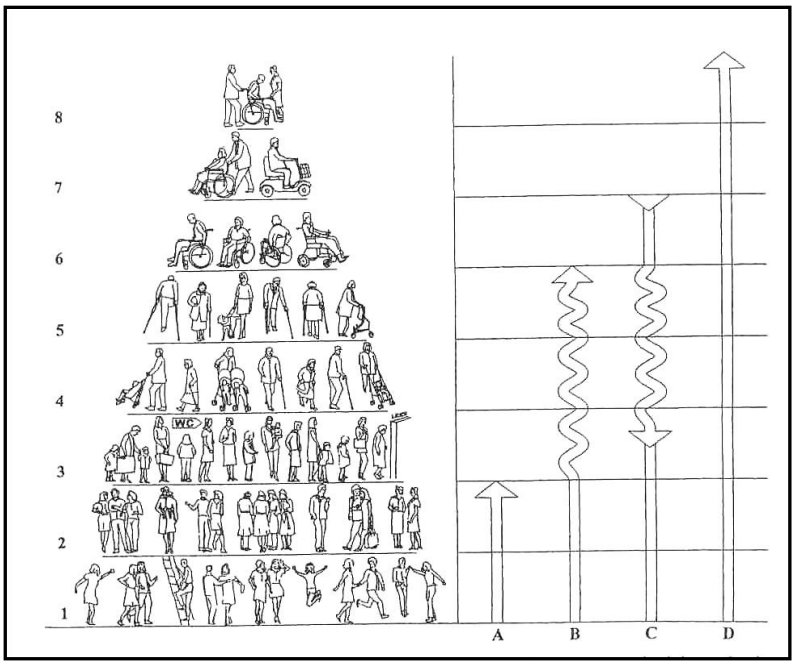

Figure 1.1:
Universal Design Pyramid (Goldsmith, 2000).

DESIGN FOR ALL

The philosophy of "Design for All" is about creating accessible environments and useful products that can function for the highest number of people - of all ages, sizes and with different skills. The aim of the concept is to make life easier for everyone by making products, means of communication and building environments, which are more usable for more people at little or no extra cost. The Danish Centre for Accessibility, DCFT quoted, "design for all" is an overall strategy and philosophy which is based on giving all people equal opportunities to participate in modern society. This means that our Physical surroundings, products and services are planned and designed so that everyone can participate regardless of age and physical ability (Sawyer and Bright, 2004).

WHAT IS AN ACCESS AUDIT?

An access audit will examine an existing building against predetermination criteria designed to measure the 'usability' of the building for disabled people. Usability will range from getting in and getting around to getting out. Depending on the measurement criteria, the assessment will examine how much of the facilities can be use independently by disabled people. A thorough audit will look at more than just physical mobility and disability. It will also examine use of the services by people with sensory disabilities and mental disabilities. The limit of what is to be assessed will depend on the frame of reference of the project. All- inclusive audits will examine printed material and publicity, staff attitudes and the physical and management issues within the building (Holmes-Siedle, 1996).

BEGINNING A PROJECT

Before deciding to conduct an audit of a building it is important to have a clear understanding of the following:

- The purpose of audit
- What are the criteria for measurement will be and which part of the building will be assessed
- The expected outcomes and their format
- Who is to carry out the audits
- The reporting of the result
- The follow-up procedures and evaluation of progress

The management of audit information and the construction of the project are key factors in the success of the project (Holmes-Siedle, 1996).

WHAT ARE THE PURPOSES?

The purpose of the access audit is to have a specific idea of what they are intended to achieve, expectations of what they will achieve, recommendation to the management procedures involve in implementing the changes that are required. Previous studies identified audits can be conducted for three main reasons.

1) Comparative survey; to gather data on the accessibility of the building facility to build a comparative table of accessibility of buildings. Project such as the Audit Commission were designed for this type of collection. This enables a statistically comparison of services provision across a region, and also a longitudinal approach to service provision over time.
2) Analytical Survey; to gather data which indicates the accessibility of a building for publication in reference work, directories and guidance that disable people will use to decide where they should go for services. The data is then disseminated through organization such as Arts line, which provides a telephone enquiry service for disable people in London to find details on places of entertainment and, more recently, restaurants.

3) Adaptive survey; to gather information which designed to generate change. These audits measure areas of inaccessibility and generate recommendation for improvement. Good audits of this nature will also prioritize the improvement and make detailed recommendation. These recommendations may indicate a cost associated with the change and the optimum time scale. This type of audit can be used to generate a 'master plan' for change.

Collection of the same information can be used for all the above objective, but the intended outcome will determine how the information is collected, the process and by whom it is collected (Holmes-Siedle, 1996). Such methodology is practiced in developed countries; however it rarely applied in Malaysia.

WHO SHOULD DO THE AUDIT?

This section will explain some research that has been carried out in the United Kingdom. Research that was carried out for the Art Council of England in 1993 indicated that the most successful audits and surveys were undertaken by a mixture of disable and able-bodied audit terms using questionnaires designed primarily by disable people. Success is taken to mean that the data collected were accurate and detailed, and represented the difficulties that a disabled person would encounter.

Audits carried out by these groups will often fall into the first categories of the Comparative and Analytical Survey types. In order to produce the Adaptive Survey the surveying and reporting team should be experience in the design of building for disabled people and the process required for their implementation. They will also need to assemble their cost recommendations from a knowledge database of product and cost of installation and building work. It is likely therefore that these types of group would include disabled people and architect experienced in adaptive work (Holmes-Siedle, 1996).

INFORMATION ABOUT THE BUILDING

The size, number and location of buildings should be confirmed, along with their age and type and use. There will be particular issues relevant to specific building types, for example an education building may have lecture theatres or laboratories with particular requirements, and a theatre will have particular acoustic requirements. The location of public transport and car parking should also be considered.

Historic buildings – whether a building is of any special architectural or historic interest is also relevant, especially if it is listed or there are restrictions on alterations. When considering alterations to a building, it is important to establish the extent of the listing. Future plans - Plans for refurbishment or alterations should be taken into account as they may affect access or they may present an opportunity to make access improvements (Sawyer and Bright, 2004).

ACCESS INFORMATION

The scope of the report and the standards against which access will be accessed should be confirmed prior to the audit. Matters that should be checked include the following:

- The standard against which the building is to be accessed;
- Whether the needs of staff are to be considered as well as customers and visitors;
- The access policy of the organization;
- Particular access problem in the building to be audited

(Sawyer and Bright, 2004).

COST AND BENEFIT

In some cases the available budget for improvements to the building may also be relevant as this can affect the scope of any alterations that may be recommended. If the size of the budget prevents the installation of a lift, this may well affect the budget prevents the installation of a lift, thus preventing recommendations for using an upper floor for providing a service or as a place of employment for a current or potential disabled employee who is going to work at this organization.

ASSESSING FACILITIES

Access audit fall into two different categories:

- Audit that access the presence of facilities for disable people.
- Audits that are designed to assess how well the facilities in the building will work for disable people.

The first type of audit is frequently carried out by questionnaires on a 'ticking' basis- i.e. the question is asked 'Is there an accessible toilet?' The response is entered into a tabular reporting procedure to show the presence or absence of such facility.

The second type of audits involves a visit to the building where the nature of the facility and how well it work for disabled people are measured, and this approach is more on consultative type. This assessment is vital to the success of an access audit. Important distinctions can be made, which is simple recording procedures cannot show. For instance, the different between a disable toilet and an accessible toilet lies in their layout and their ability to be used. Pure recording of the facilities will probably result in a tick (/) for the presence of a disable toilet if there is a toilet with the wheelchair user symbol on the door. However, due to the poor design and layout of many of these toilet facilities, many would fail the assessment as being an accessible toilet because they are unusable by disable people.

The simple recording process in unlikely to point out areas in which the facilities can be improved, other than the complete lack of facilities. The assessment of the working of the building can generate sensitive suggestions for improvement, where the improvement can be made by 'fine turning' of the building.

A description of a facility which does or does not work for disabled people will highlight the difficulties. It should also refer to the solutions required to improve the situation (Holmes-Siedle, 1996).

FEASIBILITY STUDIES

Feasibilities studies take the information from the access audit and use the data to propose detailed architectural changes which will improve the access areas notes in the audit document.

ASSESSMENT CRITERIA

Second only to the decision to measure the working of the building is the choice of a commonly accepted criterion for measurement of the building. The reason that acknowledge of the presence of a toilet marked with a disability symbol is not sufficient is that not all toilets are built to the same standard (Holmes-Siedle, 1996)

Function of Access Features

These guides on

- Why one needs certain access features
- How one can acquire hands-on experience in understanding the need for those features.
- How one can use this knowledge in conducting access surveys

(Agarwall and Sachdeva, 2005).

Space Allowance

This refers to the space needs of a person in a stationary wheelchair and a person using bilateral crutches for mobility.

Wheel Chair Dimension

How to measure the wheelchair

- Measure the outer rim of the left wheel to the outer rim of the right wheel (slip the measuring tape through the spokes of the wheelchair and space under the seat)
- Measure the edge of the footrest to the furthest edge of the back wheel.

How to measure the space required by wheelchair user

- Request wheelchair users to position their arms in push position and measure the distance from one elbow to other
- Measure the distance from the edge of the foot to the furthest edge of the back wheel. Note that in most circumstances, when the foot is placed on the footrest, part of the foot would protrude from the footrest. Moreover, some wheelchair users are unable to place their feet on their footrests.

For the wheelchair user, the dimensions include the actual wheelchair size and additional space needed to safely accommodate the user's hands and feet. For the ambulant disabled person, the space allowance is measured as the distance between the tips of both crutches when they are being used. Also pay particularly attention on how wheelchair and other assistive devices are actually used by diverse users in daily life in their own environment (Agarwall and Sachdeva, 2005).

ANTHROPOMETRIC

The scope contains dimensions that can be used for guidance when designing facilities and equipment to be used by person with disabilities.

- **Space Allowance:** Adequate space should be allocated for person using mobility devices, e.g., wheelchair, crutches and walkers, as well as those walking with the assistance of other person.
- **Protruding Objects:** Protruding object, such as directional signs, tree branches, wire, guy ropes, public telephone booths, benches and ornamental fixture should be installed with consideration of the range of a visually impaired person's cane.

  A barrier to warm blind or visually impaired person shall be provided under stairways or escalators. Walkways, halls, corridor, passageways, aisles, or other circulation spaces should have clear headroom t minimize the risk of accidents.

- **Reach Allowance:** The range of the reach (forward and side with or without obstruction) of a person in a wheelchair should be taken into consideration so that he/she will be able to do the task safely,

DISABILITIES AWARENESS – ACCESS NEEDS OF DIVERSE DISABILITY GROUPS

In order to create fully accessible environments, it is important to understand the nature of the access requirements of diverse disability groups. For the purpose of built-environment design, there are usually major disability groups:

- **Orthopedic (ambulant and non ambulant (wheelchair users):** People with orthopedic disabilities are generally those with loco motor disabilities, which affect mobility. This can mean impairment of trunk, the lower limbs, or both of these.
- **Sensory (Visual, Hearing):** People with sensory disabilities are those who, as a consequence of visual or hearing impairment may be restricted or inconvenience in their use of the built environment. They are divided into two subgroups.
  - Visually-impaired/blind person
  - Hearing impaired
- **Cognitive (Mental, developmental, learning):** People with cognitive disabilities are generally those with mental illness, the developmental or learning disabilities. Making a building plan, easy to understand is very important.
- **Multiple (Combination of any or all of the above):** People with multiple disabilities are generally those with combination of orthopedics, sensory and/or cognitive disabilities. The built environment therefore must incorporate a combination of visual, tactile and olfactory cues to assist them in their use of their surroundings.

Agarwall and Sachdeva (2005).

GUIDE TO CONDUCT DISABILITY SIMULATION

What is simulation exercise?

This is an exercise that can be used, to give participants or trainees aware that there is a relationship between disability, access and the built environment. Thus access audit enhance understanding of what it is like to be elderly and disabled. It is most effective if the exercise can span an overnight period, as many normal acts of daily living, such as going to the toilet, walking, eating and dressing, can be experienced.

When to use simulation exercise?

It is best used in a workshop situation. It can be used for small groups of five or six people or a large group of up to 30, which is divided into smaller sub-groups.

Briefing on Disability

It is important that a short briefing is given on reach disability, its causes, effects and limitations. This will help to improve understanding and involvement in then role-play situation. If blindness is being simulated, then a demonstration of how to lead a blind person must be given by someone who is familiar with the correct way of doing this.

Demonstration on use of devices

A demonstration is given of how to measure the correct height of the walking device, to adjust them and to ensure their safe use on steps/stairs and outside in negotiating curbs. It may be useful to have a physiotherapist take part in this exercise.

Medical conditions

There are various conditions that could be aggravated by simulating some of the disabilities. Advice on this is relevant to the trainees, in order to avoid any difficulties during the simulation. Check with the group if anyone has a heart condition, chest condition or arthritis and avoid allocating them a ‘disability’ that may be detrimental to their health.

How to simulate different disabilities

There are numbers of different physical and sensory impairments that can be simulated in this exercise using the equipments listed.

- Paraplegia: Use the wheelchair and walking device.
- Heart condition/chest conditions. Use the camera jacket by putting the weight into the various pockets around the jackets. Judge the total weight according to the size of the person. Small women: 5kg and large man:8kg
- Cataract: Use sunglasses.
- Tunnel Vision: Use sunglasses that had cone –shaped tubes of cardboard attached to the lenses and side screened off.
- Blindness: Use the crepe bandage tied around the head to cut out all vision.
- Deafness: Use the set of industrial ear protector (ear muffs) with cotton wool tightly packed inside them.

How to conduct the simulation exercise

- ***Pre-preparation***: Assemble the various 'device' that will be required in the exercise. Be sure to have enough for the whole groups. Work out an itinerary of places and activities for each group i.e., four or five places could be visited in sequence. Example could be: public toilet; bedroom with attach bathroom; a bus stop; post office (to buy and post stamps); a lift to go from one floor to another in a building; a shop to purchase some items on sale; a kitchen to make afternoon tea for the group and so on.
- ***The simulation exercise***: Briefly explain what is to happen during the exercise and its duration
  i) Give a short briefing on each disability.
  ii) Check with the participants for any contraindicated medical conditions.
  iii) Demonstration how to measure and adjust the walking devices for corrects height and that this is understood.

iv) Demonstrate the correct use of the various devices and ask for a return demonstration
v) Demonstrate the correct method of guiding a blind person
vi) Outline the itinerary and what is to be done at each location
vii) Divide the large group into smaller groups and allocate 'disabilities' ensuring that no participant in the group already has a medical condition that could be aggravated by the assigned simulated disabilities.

Important Tips:

- Do not force simulation exercise on any body
- Make everybody understand that this is a fun exercise in a controlled atmosphere.
- This exercise is not to highlight the disability or shortcoming of PwDs and elderly people; but to sensitize the participants about the inconvenience caused by the exiting barriers (both attitudinal and Architectural) in the built environment.

Routes/ Itinerary of the Simulation Exercise

The number of the places to be visited should be decided accordingly to the expected number of groups. Accordingly, select the numbers of places for the simulations exercise. Inform the authorities and obtain corporation and agreement for the exercise. The sequence should be different for each group so that the groups do not crowd the same place at the same side. For example: sidewalk, approach to and from a building, entrance or exit of a building, registration/information counter, staircase, toilet, corridor, lift, public telephone booth, drinking water fountain etc.

At the end of the exercise

It is important that the whole group comes together and discards its disabilities and the participants discuss their own feelings and attitude as well as those of people they met the

course of the exercise. They may also be encouraged to discuss ways of removing the barriers that they had encountered.

Question for Discussion at the end of the exercise

- How did you feel when you simulated person with diverse disabilities?
- How did the different levels of audio and visual interaction affect your ability to understand the environment and move it in?
- What barriers (physiological & physical) did you experience in the simulation exercise? What can you suggest to remove the barriers that you experienced in the exercise? (Agarwall and Sachdeva, 2005).

SUMMARY

The chapter highlights some insights on the importance of access in our built environment, giving guidelines and awareness on the standards for the disabled that are available and finally, the hope that professionals, administrators, politicians and individuals to support the built environment to have inclusive and universal design. Access audit should be continued to be practised and the results or recommendations of it to be given to the building providers or owners so that upgrading and improvement to improve access can be done according to good practice. Access audit requires skilled and professional tasks, and whoever is interested to do access audit they should be trained by experts by certain duration of time. This paper also illustrated on the process of how to access audit our built environment. International Islamic University Malaysia has the capacity to train access auditors, as we have experts from various organisations who have been a long experience locally and abroad, trained by the Asia Pacific Disability Centre, United Nation, Bangkok Thailand.

The pictures below show some of the activities carried out by the author during her training in Bangkok Thailand in 2003 and 2004.

Figure 1.2:
Access Audit on Public
Building in Bangkok.

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CHAPTER 2:
MALAYSIAN STANDARDS, OTHER REGULATIONS FOR PEOPLE WITH DISABILITIES, AND THE FUTURE DIRECTION

Asiah Abdul Rahim, Ismawi Zen, and Nur Amirah Abd Samad

INTRODUCTION

Persons with disabilities shall have the right to access to employment on equal basis with persons without disabilities.

The employer shall protect the rights of the disabled, on an equal basis with persons without disabilities, to get a fair working environment and good, including equal opportunities and equal remuneration for work of equal value, safe work environment and health, protection from harassment and restore a sense of lack of faith.

The employer shall in carrying out its social obligations seek to promote stable employment for persons with disabilities with the ability to properly assess, prepare a suitable place of employment and exercise management job.

The Council shall, in order to promote employment of persons with disabilities in the private sector, to formulate appropriate policies and measures that can add in affirmative action programs and other measures.

The Council shall promote opportunities for training for persons with disabilities in the labor market and opportunities for self-employment, entrepreneurship, cooperative development, start their own businesses and creating opportunities to work and home.

For the purposes of this section, "employer" includes.

Access to information communication and technology

Persons with disabilities shall have the right to access to information, communication and technology on an equal basis with persons without disabilities.

Government and providers of information, communication and technology shall, to enable persons with disabilities have such access, provide information, communication and technology in accessible formats and technologies appropriate to different types of disabilities in a manner that it timely and at no additional cost.

Government and private sector must accept and facilitate the use of Malaysia Sign Language, Braille, augmentative and alternative communication, and all the ways, means and formats of communication access option persons with disabilities in official matters.

Access to cultural life.

People with disabilities (PwD's) should have the rights and accessibility equal to people without disabilities.

Persons with disabilities shall have the right to enjoy access:-

- to cultural material accessible formats;
- to television programs, films, theater and other cultural activities, in accessible formats, and
- place for cultural performances or services, such as theaters, museums, cinemas, libraries and tourism services and, wherever possible, to monuments and sites of national cultural importance.

STREET, DRAINAGE AND BUILDING ACT 1974 UNIFORM BUILDING (AMENDMENT) BY-LAWS 1991

In exercise of the powers conferred by section 133 of the Street, Drainage and Building Act 1974, the State Authority makes the following by-laws;

- These by-laws may be cited as the Uniform Building (Amendment) By-laws (UBBL) 1991.

- By-law 2 of the UBBL 1984, which in this By-laws is referred to as "the principal By-laws" is amended by inserting immediately after interpretation "detached building" the following interpretation: "disabled persons" means people; with a physical, hearing or sight impairment which affects their mobility or their use of buildings as referred to under by-laws 34A
- The principal By-laws is amended by inserting immediately after by-law 34, the following new by-law 34A: Any building or part thereof to which this by-law applies shall:-
  i) be approved with access to enable disabled persons to get into, out of and within the building for which access is provided wholly or mainly for the inspection, maintenance or repair of the building, its services or fixed plant or machinery; and
  ii) Be designed with facilities for used by disabled persons.
- Notwithstanding paragraph (3) the local authority may where it is satisfied that it is justifiable to do so:-
  i) Allow an extension or further extensions of the period within which the requirements of this by-law are to be complied with; or
  ii) Allow variations, deviations or exemptions as it may specify from any provisions of this by-law.
- Any person aggrieved by the decision of the local authority under paragraph (4) may within 30 days of the receipt of the decision appeal in writing to the State Authority, whose decisions shall be final.
- The requirements of this by-law shall apply to any of the following buildings or any part thereof:
  i) Offices, banks, post offices, shops, department stores, supermarkets and other administrative and commercial buildings; except shop-houses existing at the commencement of this by-law;
  ii) Rail, road, sea and air travel buildings and associated concourses, car parking buildings and factories;

iii) Hospitals, medical centers, clinics and other health and welfare buildings;
iv) restaurants, concert halls, theatres, cinemas, conference buildings, community buildings, swimming pools, sports buildings and other refreshment, entertainment and recreation buildings;
v) Religious buildings;
vi) schools, colleges, universities, zoos, museums, art galleries, libraries, exhibition buildings and other educational, cultural and scientific buildings; and
vii) Hostels, hotels and other residential buildings other than single family private dwelling houses.

LIST OF STATE GAZETTE NOTIFICATION ON AMENDMENT TO UBBL 1984 ON BUILDING REQUIREMENTS FOR DISABLED PERSONS

1) Perlis – 3 March 1994 – PS.P.U.2
2) Kedah – 30 November 1992
3) Penang – 11 November 1993 – Pg.P.U.26
4) Perak – 13 May 1994 – Pk.P.U.26
5) Selangor – 20 January 1994 – Sel.C.U.95
6) Negeri Sembilan – 31 January 1991 – N.S.P.U.95
7) Melaka – 22 May 1996
8) Johor – 7 May 1992 – J.P.U.14
9) Pahang – 28 March 1996
10) Terengganu – 15 December 1993
11) Kelantan – 3 July 1992 – Kn.P.U.5/92
12) Federal Territory – 13 August 1993 – P.U.A.305/92

**Note: The UBBL 34A was extracted from "Guidelines on Buildings Requirements for Disabled Persons" published by the BahagianKawalanBangunan, JabatanKerajaanTempatan, KementerianPerumahandanKerajaanTempatan.*

These requirements are applicable to all buildings that disabled persons may use as members of the general public, as visitors or for purposes of employment. Residential buildings will be covered in another standard. Building types to which the recommendations of the code may be applied include:

- offices, banks, post offices, shops, department stores, supermarkets, hotels and other administrative and commercial buildings;
- rail, road, sea and air travel buildings and associated concourses, car-parking building and factories;
- hospitals, medical centers, clinics and other health and welfare buildings;
- restaurants, concert halls, theatres, cinemas, conference buildings, community buildings, swimming pools, sports buildings and other refreshment, entertainment and recreation buildings;
- Religious buildings; and
- Schools, hostels, colleges, universities, zoos, museums, art galleries, libraries, etc.

Interpretations

Access for disabled persons means 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.

Ambulant disabled persons are persons who are able to walk but who may depend on prostheses (artificial limbs), orthoses (calipers), sticks, crutches or other mobility aids, and others who can walk but have sensory impairment such as the blind and the deaf.

Circulation space means a passageway, corridor, lobby, hallway or ramp affording access between parts of a building.

Disabled persons refer to people with a physical, hearing or sight impairment or any Combination thereof, which affects their mobility or their use of buildings.

Entrance floor means the floor at which the persons using the building normally gain entrance thereto but does not include any basement or utility area.

Guiding blocks are the special tiles incorporated into the walking surface, and arranged in layouts for the guidance of the blind; they have raised markings on them which the blind can feel through their feet.

Vehicle spaces for disabled persons should be provided in the proportion of 1 space to every 100 vehicles, or part thereof available to the public.

Parking spaces should be on the flat surface and not less than 3 600 mm wide.

Flat access should be provided between each parking space and the adjoining walkway.

Spaces for parking the vehicles of disabled persons should be adjacent to at least one entrance.

Parking spaces should be identified by a sign incorporating the symbol for access by disabled persons, in accordance with Clause 28.

Disembarkation space near the main entrance to a building or complex is essential for disabled passengers. Guiding blocks leading to the main entrance should be provided.

Step ramps where the entrance floor or any other floor is not more than 215 mm above or below the adjacent street or finished ground level; or there is a change of level of not more than 215 mm within a building a step ramp, may be provided in place of a pathway or an internal ramp. It should begin at a level not more than 15 mm above the adjacent street or finished ground or floor level (as the case requires). It should be located so that disabled persons have an unobstructed view of traffic approaching from any direction. It also should have a non-slip finish in accordance with Clause 26.

Doors and doorways (forming part of access for wheelchair users) should comply with the following:

- Every doorway except those to toilet facilities should have an opening of not less than 900mm clear. In case of double leaf door, at least one leaf should have the minimum opening of not less than 900mm clear. Building such as hospital and sport complexes should have the minimum of opening of not less than 1000mm clear.
- Every doorway to toilet facilities should have an opening of not less than 900 mm clear.

SECTION ONE: GENERAL

1. Scope

(1) Guidance for designers and the building construction team to measures that should in the event of a fire, enable the safe evacuation of any disabled people.

SECTION TWO: HORIZONTAL ESCAPE

4. General

(1) Escape routes ought to be free from any feature which might impede movement, such as unsuitable door ironmongery or raised thresholds or steps between changes of level within a storey.

(2) A route leading to a final exit at substantially the same level should not pose a serious problem for those persons who cannot use stairs, but on floors other than final exit level there will inevitably be some delay whilst waiting either for assistance to travel down (or possibly up) the stairway, or for an evacuation lift.

6. Refuge Area

(1) Commentary. The limitation of distances of horizontal travel for means of escape purposes means that most disabled persons should be able to independently reach the safety of a protected escape route or final exit.

(2) A refuge is an area that is both separated from the fire by fire- resisting construction and provided with a safe route to a storey exit, thus constituting a temporarily safe space for disabled persons to await assistance for their evacuation.

(3) The following are examples of satisfactory refuge areas:

(a) an enclosure such as a compartment, protected lobby, protected corridor or protected stairway.

(b) An area in the open air such as a flat roof, balcony, podium or similar place which is sufficiently protected (or remote) from any fire risk and provided with its own means of escape;
(c) any other arrangements which satisfy the general principles outlined in items (a) and (b) and which afford at least an equal measure of safety.

SECTION THREE. VERTICAL ESCAPE

7. General

(1) It should be emphasized that this code does not recommend that evacuation lifts should be provided in all buildings; the provision of an evacuation lift reduces the need to provide physical assistance for the evacuation of disabled occupants by way of stairways.

Stairways

(1) Commentary. It is accepted in this code that a suitable lift may be used in an emergency.
(2) Nevertheless, for the evacuation of disabled people, it is essential that the design of escape stairways is considered as they will be the sole means of escape in buildings not provided with an evacuation lift, there will be the need for recourse to a stairway in the event of a lift failure, and they may be the limited use of stairs to accomplish minor changes of level.
(3) Recommendations. The following recommendations are applicable.
(4) Within a protected stairway the handrail(s) should be essentially continuous.
(5) All handrails should be of such dimension and sufficiently clear of walls to afford a firm grasp to those who need them for support (see BS 5810)
(6) Wheelchair stair lifts should not be used as a means of escape.

(7) Wheelchair stair lifts that are provided for access should not be located within means of escape stairways unless the effective width of the stairway will equal or exceed the width required for means of escape.

Ramps

(1) Ramps can be a useful alternative to stairways and, to a lesser extent, to lifts.
(2) Their disadvantage is that they take up a great deal of space and for this reason are frequently impracticable.
(3) Handrails to ramps should be color contrasted to adjacent vertical surfaces, and the provision of tactile thresholds at the top and bottom of ramps will identify the change of level to visually handicapped people.
(4) Recommendation. Any ramp provided should comply with the relevant recommendations given in BS5810* and should be provided with signs identifying the change of level.

SECTION FOUR: CONSTRUCTION AND FIRE WARNING SYSTEMS

1. Fire resistance

(1) For the purposes of complying with the recommendations of this code, a 30 mm period of fire resistance is generally considered adequate.
(2) Satisfactory performance of fire resistance of structural elements is ascertained by compliance with one of the following:
    (a) Specifications tested, or assessed, under the appropriate Part of BS 476.
    (b) Appropriate Malaysian Standard specifications or codes of practice.
    (c) Specifications referred to under building by-laws.

(3) Recommendations: Fire resistance, where recommended in this code, should be taken as requiring not less than a 30 mm period of fire resistance, and implies the following:
   (a) for walls and partitions equal compliance for integrity and insulation from either side and compliance for load bearing capacity where appropriate;
   (b) for glazed elements equal compliance for the appropriate criteria from either side (see 11.3.2);
   (c) for doors, compliance for integrity from either side, except in the case of doors to lift wells, where performance is in respect of exposure of the landing side only.

2.3.4. Public toilets

Public toilets shall provide:
(a) a safe environment;
(b) facilities where users may carry out personal hygiene and grooming tasks in privacy;
(c) a hygienic environment unlikely to cause infection, disease or soiling of clothes;
(d) all likely users of any gender, age, or combination of gender and age including parenting needs;
(e) the needs of disabled people and their carers,

3.4. Design considerations

3.4.1. Safety/security

Public toilet facilities and their entrances shall be obvious to the passing public and shall not be concealed. Safety and security will be affected by:
(a) location;
(b) sitting;
(c) entrance orientation;
(d) absence of dead ends and loitering spaces;

(e) use of fully enclosed, self-contained toilet units;
(f) lockable doors to toilet units;

3.4.2. Privacy

(1) Users shall be able to carry out personal hygiene and grooming tasks in private.
(2) Privacy will be affected by:
(a) vision, sound and odor isolation;
(b) fully enclosed, self-contained toilet units;
(c) lockable doors to toilet units; and
(d) Avoiding communal toilet activities.

3.4.3. Hygiene

(1) Users shall be provided with a hygienic environment unlikely to cause infection, disease or soiling of clothes.
(2) Hygiene will be affected by:
(a) appropriate toilet fittings;
(b) cleanliness and working order;
(c) easily cleaned toilet fittings and surfaces;
(d) provision of cleaning facilities;

3.4.4. Equality

(1) Public toilets shall cater for all likely users of any gender and irrespective of physical disability.
(2) Equality will be affected by provision:
(a) of accessible toilet units;
(b) of all-gender toilet units;
(c) of parenting facilities;
(d) of fittings suitable for children;
(e) of fittings for different cultures or religion; and
(f) for users/careers of different gender.

3.4.5. Convenience

Convenience of use of public toilets will be affected by:

(a) location;
(b) opening hours;
(c) number of toilet units;
(d) provision of appropriate features; and
(e) provision of appropriate fittings.

3.4.6. Vandal resistance

(1) Public toilets shall resist vandalism so as to remain available for use and to provide pleasant surroundings.

(2) Vandal resistance will be affected by:
(a) location;
(b) sitting;
(c) entrance locations;
(d) illumination levels;
(e) opening hours;

17. Water closets (MS 1884: 2002)

17.1. Water closets for wheelchair users should comply with the following:

(1) In every public building required under 16.1 to be provided for water closets for use by wheelchair users, the water closets should be accompanied by an unobstructed area having dimensions not less than those shown in Figure, but the layout of the water closet and unobstructed area may be reversed in plan (mirror image).

(2) The water closets should be provided either:
(a) as a combined water closet and washroom; or
(b) as water closets for use by men or women. In this case separate washing facilities are to be provided together with the water closets, where the washbasin is to be located within the unobstructed area or common facilities outside the water closets.

23. Shelving and wall units

23.1. For wheelchair users:

(1) Shelving and wall units for use by wheelchair users should comply with the following:

(a) The configuration of unobstructed shelving and wall units should be as shown in Figure 21(a) including the notes thereto.

(b) The configuration of shelving and wall units adjacent to work surfaces should be as shown in Figure 21(b) including the notes thereto.

(c) The vertical space between hotplate elements or burners and combustible material should not be less than 750 mm.

23.7. Door handles and related hardware and accessories should comply with the following:

(1) Doors should be operable with one hand. Handles or other operating deviser should not be less than 900 mm nor more than 1200 mm above the finished floor level and should be horizontally aligned with any adjacent light switches.

(2) Handles for hinged door should be made from non-slip material of lever action type.

(3) The clearance between the handles and the back plate should not be less than 50 mm.

FUTURE DIRECTION

Vehicular Parking and access (new clause No. 1.2.5)

(1) In proportion of 5 space to every 100 vehicles.

(2) Should be located nearest to the main entrance and nearest to an accessible vertical circulation if located in levels other than nearer the main entrance.

(Source: British Standards BS83000)

All Ramps design should:

(1) Be provided with landing rest areas not less than 1200 mm in length at intervals of not more than 3000 mm.
(2) Be provided on each side thereof with a handrail.
(3) Be provided on the open side with a kerb not less than 100 mm high

Main Entrances shall:

(1) Be through the main entrance of the building.
(2) Directional signs bearing the symbol shall be displayed at all other non-accessible entrances to direct persons with disabilities to the entrance.
(3) Entrances and exits used by the visually impaired persons should be identified for them by tactile blocks.

Step Ramps:

(1) There is a change of level of not more than 166 mm or goings not more than 2000 mm within a building a step ramp, may be provided in place of a pathway or an internal ramp.

Maneuvering spaces at doors

(1) The doorway of a one-way swing door shall have maneuvering spaces on both sides for wheelchairs and the following clear spaces shall be provided adjacent to the leading edge of the door as followings:-
    (a) On the pull side, a minimum space of 600 mm; and
    (b) On the push side, a minimum space of 300 mm.
    (c) Where two-way swing doors or sliding doors are used, a minimum space of 300 mm adjacent to the leading edge of the door shall be provided on each side of the door.

Two Doors in Series:

(1) The minimum space between two hinged doors or pivoted doors in series shall be 1200 mm plus the width of the door swinging into that space.

Stairs

(1) Straight and return stairs should have landings to minimize the danger in case of a fall.
(2) Handrails should be installed for use especially by people with walking difficulties, elderly people, and visually impaired people.
(3) Treads and landings should have a non-slip surface.
(4) Nosing should be easily distinguishable by colour. It should not protrude to cause stumbling.
(5) Tactile warning blocks should be laid at the landing on the top and bottom of the stairs to ensure they are easily detectable (tiles are not necessary in landings where handrails continue on from the steps).

Escalators and Moving Walks

(1) If normal access by elevators is difficult, wheelchair accessible escalators should be installed.
(2) Escalators should be located next to the main route of access.
(3) Fixed handrails should be installed at both ends of escalators to improve safety for elderly and disabled people.
(4) Emergency stop buttons should be installed on a wall surface or post near the escalator landing.
(5) Users should be alerted by installing tactile tiles or audible information devices in the escalator landing areas.
(6) Signs and information displays should provide clear directions to escalators.

SUMMARY

This chapter focusing on various available regulations, guidelines, Acts and Malaysian Standards that have been used in most local authorities in Malaysia in order to provide facilities for the people with disabilities in Malaysia

REFERENCES

MS 1184 (2004); *Code of practice of Access for the Disabled People Outside Buildings*: Malaysian Government

MS 1331 (2003); *Malaysian Standard: Code of practice on access for disabled person outside the public building*; Malaysian Government

MS 1183 (1990); *Part 8: Code of practice for precautions in the design and construction of buildings, and Part 8: Code of practice for means of escape for disabled people*; Malaysian Government

People With Disabilities Act (2008); Kuala Lumpur, Percetakan Nasional Malaysia Berhad, on behalf of Malaysia Government.

Uniform Building By-Laws (1984); Malaysian Government.

CHAPTER 3:
ACCESSIBLE BUILDING DESIGN: TRANSPORTATION BUILDINGS – CASE STUDIES OF LRT STATION OF BANDAR TASIK SELATAN, FERRY JETTY OF PENANG, AND FERRY JETTY OF PANGKOR ISLAND

Muna Hanim Abdul Samad, Asiah Abdul Rahim, NurAmirah Abd Samad, Wan Mariah Wan Harun, and Zulkefle Ismail

INTRODUCTION

On December 13, 2006, the United Nations formed the Convention on the Rights of Persons with Disabilities Convention to protect and enhance the rights and opportunities of the world's estimated 650 million disabled people. Many countries sign up to the convention and agree to adopt national and enact laws so that persons with disabilities would have equal rights to education, employment, and cultural life; the right to own and inherit property; not be discriminated against in marriage, children, etc; not be unwilling subjects in medical experiments (United Nation, 2006).

The main aim is to ensure that PWDs are able to live an independent life and partake totally in all aspects of life, and have access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communication technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas. Estimates of worldwide and country-wide numbers of individuals with disabilities are problematic due to the varying approaches taken to defining disability. However, in

2004, the World Health Organization estimated a world population of 6.5 billion people, of those nearly 100 million people were estimated to be moderately or severely disabled (WHO). However in 2011, the percentage of people with disabilities is 15% of the world population. (WHO 2004).

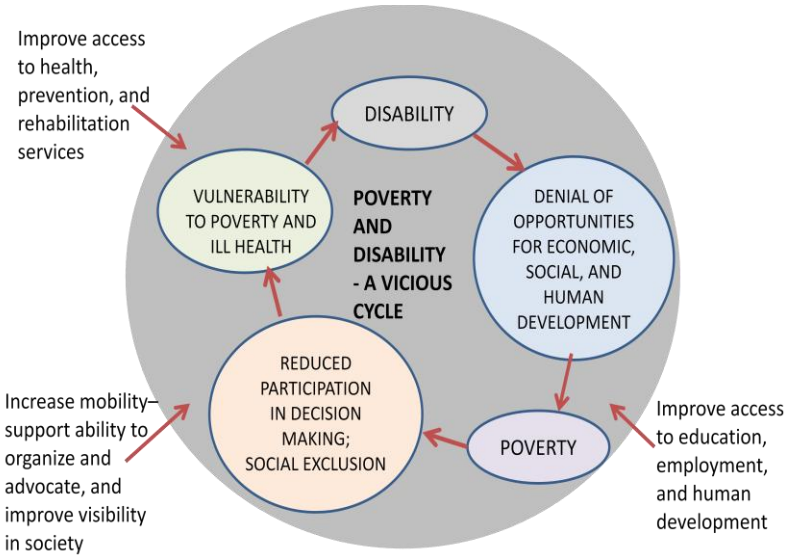

Figure 3.1:
The disability–poverty cycle and the role of transport in breaking the cycle and improving quality of life
Source: Department for National and International Development, London (2000),

Figure 3.1 illustrates how poverty and disability are inter-related and reinforce each other and the role that can be played by transportation in improving the cycle and mobility. Disability often leads to exclusion from education and employment opportunities, thereby causing economic hardship (Venter et al, 2006).

In developing societies strong social and cultural attitudes persist in isolating and excluding people with disabilities from mainstream society. People with disabilities who are denied educations are frequently unable to find employment, driving them deeper into poverty.

According to Venter et al (2006) the general framework in making progress for accessibility should expand in three stages firstly advocacy and departure from welfare model followed by access to public buildings and public spaces and finally access to public transport systems in main city as well access to smaller vehicle and other areas as shown in Figure 3.2 as follows.

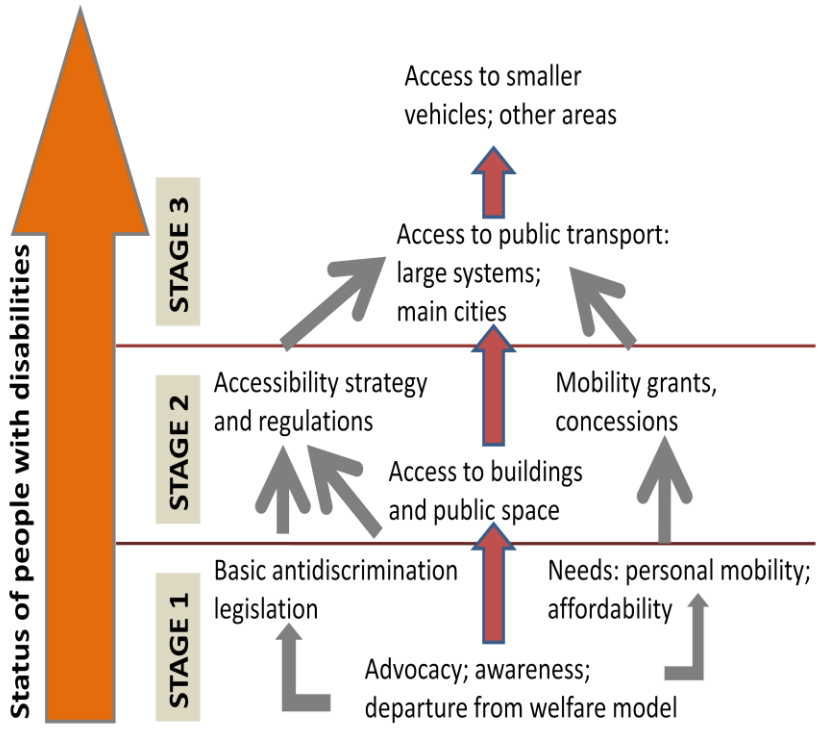

Figure 3.2:
General framework of progress in accessibility provision
Source: Venter et al (2006)

Studies on transportation systems in USA (New Jersey Department of Human Services, 2005; and The Indiana Governor's Council for People with Disabilities, 2003) conclude that the transportation system needs to provide a diverse set of accessible service options, tailored to a specific region. The studies also highlights the complexity of the problems facing human services agencies dealing with the provision of transportation services for people with disabilities which require a whole spectrum of solutions from fostering awareness, expand resources, increase vehicles and facilities, education and training of bus operators and drivers, change in the action agenda of legislative, regulatory, programmatic and policy. To execute all the recommendations require the involvement of all levels of stakeholders and key players.

UNDP Malaysia (2008) has also conducted similar project to support the development of a fully accessible public transport for the State of Penang Malaysia whereby an audit inspection of vehicles (buses, trains, taxis); ferry terminals, train and bus stations and the airport; infrastructure (bus stops, taxi pickup points, and surrounding pavements and pathways) signage; availability of information on various transport systems. The project also will provide a report outlining detailed recommendations and training workshops for transport staffs. However, thus far the outcome of this project has yet to be published and implemented. Other than that, the research highlighted in this paper was conducted across Malaysia and is the first large scale access audit exercise to give an idea on the state of accessibility for the country.

BACKGROUND

This paper is based on a research conducted by a team of researches headed by International Islamic University Malaysia in 2008 on the accessibility of different typologies of buildings and facilities ranging from public places/parks and riverfronts, shopping malls, public buildings, transportation buildings, mosques and housing throughout

Malaysia. The research is funded by the Ministry of Women, Family and Community Development as part of a positive effort to ascertain the level of provisions and effectiveness to ensure that PWDs in Malaysia are given equal opportunity by society. In 2006, the official figures of disabled persons in Malaysia who have registered with the Department of Social Welfare are 197,519 (UNDP Malaysia, 2008).

As a developing nation it is crucial that these PWDs are given the same right as other citizen to a life of mobility for employment, social and recreational opportunities. This paper highlights the findings for one of the typology in the research which is on transportation buildings. Four case studies were chosen for this purpose and they are:

1) LRT Station Of Bandar Tasik Selatan, Kuala Lumpur
2) Ferry Jetty Of Penang (Tun Uda Ferry Terminal of Penang Island and Sultan Abdul Halim Ferry Terminal of Butterworth)
3) Ferry Jetty Of Pangkor Island, Perak

METHODOLOGY

The methodology for the research in these transportation buildings was carried out by two means firstly by conducting access audits on two case studies namely the LRT Station of Bandar Tasik Selatan and Tun Uda Ferry Terminal of Penang Island and Sultan Abdul Halim Ferry Terminal of Butterworth. Secondly by using expert observation of the premises to predict the level of accessibility was used for Ferry Jetty of Pangkor Island. The aim of access audits is to assess the adequacy of the premises mentioned above and to implement remedial measures where necessary.

According to Ward (2002) access audits is the most valuable tool for any building that may require public access or is a place of work. Methods of obtaining data for the research also includes direct observation, secondary data, analysis of architectural and working drawings plans of case study buildings, surveys and interviews.

For the access audit exercise, The Ministry of Social Affairs was contacted to acquire assistance in identifying PWDs who were willing to participate in the access audits. The profile of PWDs partaking in the audit access were vision impaired, hearing impaired, PWDs on wheelchair and PWDs on sticks/crutches. Discussions were held with the PWDs before the actual access audits simulations were conducted to brief them on the whole purpose and procedures of access audit.

During the access audits equipments used were; wheelchairs, measuring tapes, cameras, sketch books and gradient models. The simulation during access audits begins by observing the car park facilities for PWDs followed by observing pathways, doorways, ramps, toilets as well as audio and visual signage, public telephones, counters and other facilities vital to ensuring the accessibility and safety of PWDs.

ANALYSIS OF CASE STUDIES

LRT Station of Bandar Tasik Selatan, Kuala Lumpur

It is one of an exchange train station located in Bandar Tasik Selatan, Kuala Lumpur. It is intended as a transportation terminal in the south of Kuala Lumpur. It is connected by the Middle Ring Road 2 at the south-east and Sungai Besi Expressway on the west, This station connects three types of public transport stations which are Rapid KL-Ampang, KTM Commuter and Express Rail Link (ERL) KLIA Transit to Kuala Lumpur International Airport. The stations are located adjacent to each other and connected via pdestrian bridges and equiped with basic facilities such as automatic ticketing machines, public toilets, escalator, lifts, phone booths and car-parking. Eventhough the station connects three types of transportation but two out of the three case study complex do not provide any accessability to PWDs.

The KLIA transit began its operation in 2002 connects KL city centre to Bandar Tasik Selatan, Putrajaya, Cyberjaya, Salak TinggiI and KLIA airport. In comparison to the other two stations, it is better equiped for all layers of users. It provides lifts, public toilets, and the latest double opening platform for easy accessability to the users. The ERL Station is located beside the KTM Commuter Station and provides a 95m long link bridge from the other two stations. The KTM Commuter station was first introduced in 1995 to connect commuters from Kuala Lumpur city centre to the outskirts and reduce road congestion.

Rapid KL-Ampang was opened in 1998 and carries more than 130, 000 to 150, 000 passengers on a working day and on average about 120, 000 passengers on week-ends.

Figure 3.3:
KTM Commuter Station

Figure 3.4:
Aerial View of the LRT Stations

Figure 3.5:
The ERL KLIA Transit Station

Figure 3.6:
Interior of KTM Commuter Station

Figure 3.7:
Train Platform and Main entrance to Rapid KL- Ampang

Results from the access audits show that for ERL KLIA Transit accessibility from main entrance is good however not from the drop-off point as the drop is too high without curb cuts. There is no obstruction to the trains for all PWDs. However there is a gap from platform to the actual train which can be a danger to PWDs on wheelchair and on sticks. The ticket counter is slightly high for wheelchair users. For the vision impaired tactile guiding blocks are provided all along from main entrance right to the train platform. There is PWDs toilet available however no Braille signage to differentiate between male and female toilets. There is also no Braille on lift buttons.

For the hearing impaired there is not enough signage to give information required. As for the KTM Commuter Station, PWDs on wheelchairs can enter through the pedestrian bridge from ERL Station but not from Rapid KL-Ampang. There is no bus or taxi waiting area that can connect PWDs from the station. For the vision impaired there is no tactile block at the main entrance to the ticketing counter.

The Rapid KL-Ampang Station has its strength and weaknesses. The motorcycles parked along the main entrance tend to obstruct accessibility for all PWDs. There are curb cuts available although a bit steep. For vision impaired PWDs there are no tactile blocks to guide them into the building. The counter ticket is slightly high for wheelchair users. For the wheelchair users although they have access to the counter ticket but still not possible for them to board the train as accessibility to the train platform are via staircase without any ramps or lifts are available. PWDs toilet is provided. There is again a gap between the train and platform which may cause difficulty to the vision impaired. This station provides a proper waiting area for buses and taxi. Generally the ERL KLIA transit provides the best accessibility for PWDs whereas the other two stations especially Rapid KL-Ampang requires major retrofit.

Two years after this research was completed, and in 2011, Rapid KL Ampang is now upgrading their facilities by providing vertical circulation – that is to add lifts and other facilities for PWDs.

Figure 3.8:
Proposed mobile ramp for PWDs on wheelchair

Penang Ferry Terminal (Raja Tun Uda Ferry Terminal, Penang Island and Sultan Abdul Halim Ferry Terminal, Butterworth)

Raja Tun Uda (approx. 2.02 hectares) and Sultan Abdul Halim (approx. 3.0 hectares) Ferry Terminal operate 24 hours a day and serve as the main access linking Penang Island and Peninsula Malaysia after the Penang Bridge. The services cater for pedestrians, motorcyclist and cars crossing the channel. It remains one of the busiest traffic route and is popular among pedestrians connecting them to the common public transport services, the bus and taxi stations strategically located in the city of Georgetown and Butterworth.

The terminal buildings allows pedestrians to be linked from the bus and taxi station at Raja Tun Uda Ferry Terminal Penang, aboard the ferry to Sultan Abdul Halim Ferry Terminal and connects them to the bus, taxi and KTM train station in Butterworth and vice-versa. The simulation found that PWDs were able to access the circulation route at Terminal Raja Tun Uda from Rapid Bus Station with ease. However no PWDs drop off point and car parking facilities were provided. The ticket counters were too high and without leg room for wheelchair users to comfortably engage in communication.

Figure 3.9:
From Rapid Bus

Figure 3.10:
High Counter Ticket

Figure 3.11:
Long Corridor

Long and narrow circulation path (2000mm wide) with uneven surfaces treatment due to wear and tear creates difficulty in PWDs mobility especially during peak hours between 6:30–8:30 am and between 4:30–7:30 pm. Placement of dustbins and uncontrolled parking along the circulation route hinders the movement of the PWDs. The use of tactile for the vision impaired were only found between the pathway from Rapid bus drop off point to the point connecting the main circulation route at Terminal Raja Tun Uda.

There were no electronic or Braille information available for the bus and ferry schedule for the public as well as for the vision impaired and the PWDs in general. The disabled on crutches found the pathway too far and tiring without the provision of resting areas. The problem is further aggravated by the long and steep ramps requiring wheelchair users to be assisted up or down the ramps. The simulation found that the staircase and the ramps provided at Terminal Sultan Abdul Halim were critical areas and unsuitable for the disabled travel experience.

There were no means of access for the disabled on wheelchairs and on crutches to travel independently from the ferry to the taxi, bus and the KTM terminal at Butterworth. The ramps and staircases lack proper handrail design in terms of its material use, sizes and construction joints. Air-condition units and other obstructive objects such as columns were found along the travel route. No tactile warnings were found on the floor surfaces of the travel route.

There was no toilet facilities provided at Raja Tun Uda Ferry Terminal and one accessible toilet was recently provided at Sultan Abdul Halim Ferry Terminal but failed to follow the MS Standards. Ramp laid to the toilet entrance was unfriendly to wheelchair users. The door was fixed with inappropriate lockset and positioned wrongly causing difficulty to open it. The $4m^2$ area provided is insufficient for wheelchair users to maneuver inside. The space as also used as storage and the PWDs were prohibited to enter at the time the access audits.

Facilities such as the public telephone services were inappropriately located and at an inconvenient height (1500mm from floor level), difficult to reach for disabled person on the wheelchair. Some of these public phones were installed on the columns in the middle of the main travel route causing disruption in the flow of the pedestrian traffic. There were no Braille alternatives on the key pads and SMS facilities for the visually impaired and the hearing impaired respectively.

The accessibility for the PWDs is urgently required at the present Ferry Terminal Raja Tun Uda and Ferry Terminal Sultan Abdul Halim, the bus and taxi stations and in the ferry itself. Factors that need to be considered in the provision of the PWDs are a comfortable width and distances of circulation routes for the physically impaired. Low gradient ramps, suitable handrails, appropriate floor surface treatment and resting areas at an interval of 100 meters need to be provided. Strategy on the use of tactile requires proper thoughts to provide continuity and safety in the travel experience of the vision impaired.

Unfortunately 90% of the travel distance in the terminal was without the tactile and warning signs. There is lack of sources of information and warnings for the hearing impaired. The translation of the sign language should be provided at strategic location for ease of communication between the public and the hearing impaired. Public phones should be provided with Braille keypads and SMS message services. There is a future proposal for a fast boat terminal to the existing one to be developed by Penang Port Sdn Bhd, integrating the fast boat terminal with the development of the Penang Central, Butterworth.

The RM2 billion project is due to start construction in 2009 in which after completion will consist of 2 monorail platforms, 50 bus platforms, and 4,000 car parks to cater for 200,000 users per day.

Huge development such as the Penang Central should definitely response to the need of all and address the issue of accessibility in the planning and design of the travel route within and between the spaces provided. The PWDs' requirement should take centre stage during the design, precurement and management of the terminal. Planning and building approvals should strictly adhere to the Malaysian Standard MS 1331, 1183, 1184, 2015: Part 1-4.

Lumut Ferry Terminal, Pulau Pangkor.

Pulau Pangkor is a popular island as a holiday destination and is populated by 20,000 inhabitants. The main economy for the island is tourism industry. The distance from Kuala Lumpur to the island is about 330km on the north-south highway. The Island is connected to the mainland via ferry services operating 24 hours and there are four jetties on the island namely the Pangkor Jetty, Sungai Pinang Kechil Jetty, Perkampungan Teluk Dalam Jetty dan Teluk Cempedak Jety. However Teluk Cempedak Jetty are disfunctional due to construction error.

Figure 3.12:
Ramp leading into the Terminal

Figure 3.13:
Covered corridor from car park

Figure 3.14:
Steep staircase into ferry

The study carried out indicates that the Jetty is directly linked from the multi-storey car parking about 300m away and access is via covered walkway. The path and ramps are designed with the correct gradient suitable to PWDs on wheelchairs. There are also facilities such PWD toilet, public phones, comfortable waiting area, eateries and kiosks. However, there is a problem for the PWDs to board the ferry due to the steep staircase leading to the platform. The solution has always been by carrying the PWDs on wheelchairs by the ferry staffs. The pontoon construction used for ferry platform to allow flexibility for high and low tide may be a problem for PWDs. Special design of ferry platform should be looked into to improve accessibility into the ferries.

SUMMARY

Access audit conducted for this research is an important tool to give a true picture on the level of accessibility for the PWDs in the country. Unfortunately as discussed in the paper it indicates that the current facilities are very much in dire need of remedial actions for renovations to ensure accessibility for PWDs. There is an urgent need by central government to look into the transportation systems and connectivity within major cities and inter-cities for PWDs to provide equal opportunities in employment, social and recreational activities. More concerted efforts by all stake holders in public, private, professionals, NGOs and PWDs bodies to educate, enhance awareness and push forward in ensuring that barrier free and universal design is mandatory rather than optional for the interest of the nation. Revamping the education of architects, planners and other relevant fields to include universal and barrier free design as part of the curricula and learning outcomes. For existing buildings, local government should play a bigger role to ascertain that access audits are conducted and buildings be retrofitted accordingly to allow for accessibility in future.

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CHAPTER 4:
RECREATIONAL PARK FOR ALL – TAMAN REKREASI KIARA, KUALA LUMPUR

Saodah Wok & Ardi Herman Mohd Mardzi

INTRODUCTION

This paper discusses the importance and functions of a recreational park to be used by all people, including accessibility to all groups regardless of age, culture, background, gender, abilities and social status. Recreational spaces should be a safe place for everyone to enter in terms of its function, accessibility, connectivity and usability.

This paper discusses the methodology used while the research is conducted, in which the main concern is towards general observations and interview with the users concerning the accessibility of the park. This research also requires the researchers to carry out evaluation on the level of accessibility and how can they be overcome.

The paper, thus, elaborates about types of parks in general, the criteria and requirement of a park, and to make a simple comparative study of recreational parks between local and oversea, in terms of accessibility and how do the park serve people well. The findings are intended to provide proposal and recommendation on appropriate design criteria for people with disabilities to have access.

OBJECTIVES OF THE RESEARCH

1) To identify the needs of the users, especially the people with disabilities (PWDs) and elderly in their outdoor living environment, particularly in the recreational spaces;

2) To understand current guidelines of public parks and recreational areas and how it suits the needs of the PWDs and the elderly
3) To evaluate parks' accessibility and landscape features to be more disabled friendly.

BACKGROUND

Taman Rekreasi Kiara is situated in Taman Tun Dr. Ismail, in Kuala Lumpur. Measured 15.92 hectars or 39.32 acres, this park located at Jalan Haji Openg. It is part of Bukit Kiara Arboretum Park, which consists of large forest, meant for research and as reserved forest. This park has a natural spring that flows to the main lake and several existing small lakes.

This park becomes a centre of attraction especially during weekends, whereby many residents of Taman Tun Dr. Ismail spend their time every morning and evening visiting this park, for recreational purpose. Among the usual activities carried out are jogging, strolling, cycling, fishing, viewing, physical exercising such as Tai Chi, Yoga aerobic, as well as for research activities of the students.

Figure 4.1:
Beautiful scenery of Taman Rekreasi Kiara

Figure 4.2:
Access around the main lake at Taman Rekreasi Kiara

The park consists of landscape elements, meant to suit the recreational needs for all levels of users including the disabled. It has two entrances; first entrance is adjacent to Sekolah Kebangsaan Taman Tun Dr Ismail. It accommodates facilities such as parking area, sports facilities, and the management office while the second entrance is located 300 metres for the main entrance, which also accommodates parking areas, maintenance office, picnic area, and children playground. Taman Rekreasi Kiara also has complete facilities such as security post, accessible toilets, arrival plaza, jogging trek, cycling trek, jungle trail, gazebos, open courts, wooden suspended bridge, balancing pond with water jet, children adventure play area, fitness equipment station, waterfall, pebble stream, fish pond, palm groves and camping area (Kuala Lumpur City Hall, 2008).

LITERATURE REVIEW

Concept and theories of recreation and recreational parks

The popular conception of landscape design has been that it is an art confined to private gardens and parks. A successful park and open space requires good design, proper management, and supportive people, accessible and user-friendly. Creating a park should be with purpose to provide people with access to fresh air and to the nature for their recreation. Parks should also be the place where people can meet and enjoy each other's company, as well as to promote pride in the community.

The beginning of park history in Malaysia indicated that they were built for the pleasure of the royal families only. The royal palaces in Malaysia are the most important and dominant landscape elements of traditional settlements, being the largest residential unit and centre. The earliest gardens of the tropics were those planted in the compounds of the religious complexes and around Malay traditional palaces and they were not made public. When the British arrived, the concept of park usage has changed. It was meant for recreational purposes and were made accessible and to be used for the public. Later, park developments in Malaysia began to evolve into a desire to increase the quality of living among the residents, realizing the aspirations of the Garden Nation concept throughout the country today (Yaman, 2009).

Definition of Park

According to the American Heritage Dictionary of the English Language (2000), park means an area of land set aside for public use, such as a piece of land with few or no buildings within or adjoining town, maintained for recreational and ornamental purpose. Park can also be considered as a landscaped city square. It is also a large tract of rural land kept in its natural state and usually reserved for the enjoyment and recreation for visitors.

Othman (2006) mentioned that park is an outdoor space utilized by public, comprises of passive activities such as sittings, picnicking, viewing etc while the physical activities are similar into sporting, strolling, etc. Othman (2006) also mentioned that parks' location can be varied from urban setting, city, and suburb or rural. In short, park is a place for conducting recreational activities, sports, contemplating, meeting place or as a socializing place. Parks can be regarded as a communal space as well, and they can be shared by various types of users from different background and culture. It is always meant to serve the people for social used and the most important is that it should be accessible to all groups of users and all levels of community.

Related Definition of Terminologies

Neighborhood Park:
Meant for active and passive activities, designed to serve residents who able to reach the space within walking distance; cater for users from various stages of age, ethnic and cultural background; types of neighborhood can be identified as 'Adventure', 'Creative Play' or 'Robinson Park'.

***Nature Park*:**
Normally located at suburb area for town or city dwellers; comprises of natural settings such as moors, pastures, dunes, marshes, stream or woodland and cohesive with man-made features such as artificial lake/pond, or waterfall; only certain parts of the space to function actively; usually located 50km or more from town; the purpose of its existence is to reduce stress and tension of city dwellers and create a natural tranquility, peaceful and calmness environment to park users; the park is closely related to environmental conservation, however, the type of recreational activities offered are important.

Urban Park:
Located in the centre of a town or city; maintenance, vandalism and safety are the concern, the design characteristics are either an open lawn or paved/graveled approach; problems in developing urban park are to search for convenient location in densely inhabited city/town and secondly is the highly cost of land.

***Regional Park*:**
This park usually manage by regional, municipal or state, while the size is small in acreage; normally the aesthetic value of the landscape is preserved from highly industrial activities and urbanization at nearby location (i.e. preserved old mines, traditional agricultural methods). Users attracted to the space due to its recreational, educational, cultural activities offered; sometimes attract users by offering the natural beauty of landscape through pond, lake or plantation design.

***Theme Park / Amusement Park*:**
Involve large scale of commercial investment; need to consider its proper location, accessibility, and size towards achieving objective; experience continuous alteration on landscape and construction because to satisfy users needs; it is also a place for having leisure and recreational activities for children as well as the adults.

Criteria Needed in Setting up a Successful Park

1) Accessible to park users; vehicular, pedestrian.
2) Convinced that the space is supposed to be utilized for outdoor activities.
3) Aesthetically welcomed from outside and inside.
4) Equipped with appropriate facilities and amenities.
5) Provide the sense of security to park users.
6) Promote and improve health condition albeit perhaps contemplating, exercising, etc.
7) Activities proposed should target on the user's needs.

8) Ability to offer diversified activities in order to cater all types of users.
9) Create a space that provides calmness and comfort regardless of issues, such as climatic, population and location.
10) Accessible to disabled, elderly and children.
11) Relate the park design to any suggested requirement implemented by Ministry of Health, i.e., Therapeutic Space, Reflexology.
12) Provide activities and facilities, which are suitable for the surrounding and the users themselves.
13) Allow users to assimilate the space offered; create the sense of belonging.
14) Economically and low maintenance in the long run.
15) Stress on facilities, amenities, activities proposed must be equal and balanced in terms of design and budget imposed.

Health in Malaysia

Saodah and Siti (2008) stated that people everywhere is exposed all their lives to an almost limitless array of risks to their health, whether in the shape of communicable or non-communicable diseases, injury, consumer products, violence or natural catastrophe. The Government's primary aim in the area of health is to ensure that all individuals attain and maintain a healthy status that will enable them to pursue a socially and economically productive life. The government has also implemented preventive programmes and expanded health facilities to widen coverage and accessibility of curative and rehabilitative health services in the country. Recreational park is one of the facilities that can be used to facilitate health status of the users.

METHODOLOGY

The study was conducted with the purpose of observing current situation and condition of the selected case study area, in which its accessibility by all people is to be observed. Researchers also identified any barriers that might cause harm or denying the movement of certain groups of people, especially the disabled persons and the elderly.

This study uses qualitative analysis research design to tap and capture information at the recreational park. Qualitative researches study things in their natural settings, attempting to make sense of, or interpret phenomena in terms of the meanings people bring to them. It usually involves field observation, focus group, case study, and in-depth interview. For this study, field observation and in-dept interview are carried out. As such, this study employs triangulation method of data collection, employing more than two methods of data collection. In other words, data were obtained from looking at problem from a number of viewpoints. 'Triangulation of Observers' refers to a situation where several observers and researchers with varying perspectives, backgrounds and social characteristics observe people's behavior (Abdul Rashid, 2009:25).

Field observation was carried and the target users were the wheelchair users, the blind, and the elderly. Observation was also made towards young children's movements, and their accessibility to places such as playground, jogging track and par-coarse.

Saodah (2006) stated that there are two types of observational measurement techniques:

- Direct observation – the researcher watches people engaging in communication process
- Indirect observation – the researcher observes communication artifacts, for example recording/transcripts of events either written, audiotape/videotape.

Observation was made whether or not the Taman Rekreasi Kiara has been frequently visited by either the elderly or

disabled persons, and in terms of the use of the facilities provided for them. Many comments and suggestions from the visitors from these categories of disabled persons were noted for any possible action and for further analysis to be taken.

In-depth interview was conducted in order to gather extremely detailed information from small nonrandom sample. It gives advantages where it is able to observe nonverbal responses as well and ability to obtain detailed information and accurate responses to 'sensitive' question (Wimmer and Dominick: 2000). The in-depth interview for this study was conducted with relevant personnel at the Taman Rekreasi Kiara. Among them were the Supervisor of the park, security guards, and the frequent park users.

FINDINGS OF THE CASE STUDY

Taman Rekreasi Kiara is a neighbourhood park which accommodates recreational facilities for active and passive activities. The concept of the park is Mini Arboretum that emphasize educational, and research within a recreational park (Mardzi, 2008). The design of the park considers the existing topography and landform so that it will create interesting journey. For this case study, the recreational park has been divided into three zones, which is purposely to ease the tabulation analysis and to simplify the data gained. These zones are Zone A, Zone B, and Zone C.

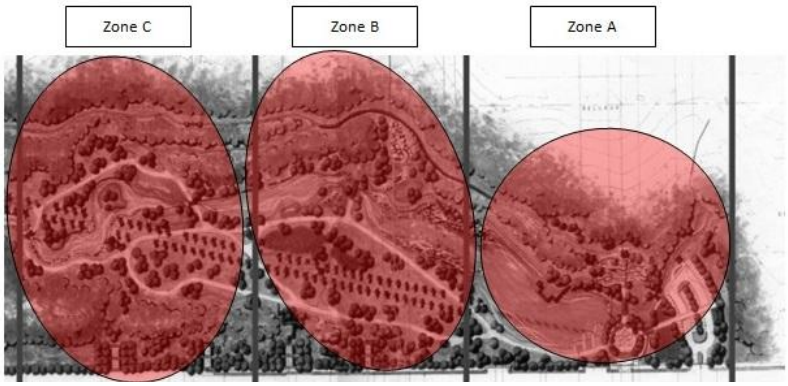

Figure 4.3:
Division into zones in Taman Rekreasi Kiara, Kuala Lumpur
(Source of map: Dewan Bandaraya Kuala Lumpur, 2008)

The observations in Taman Rekreasi Kiara, Taman Tun Dr Ismail, Kuala Lumpur was carried out by assessing people's movement and behavior, particularly on the accessibility for the disabled persons and the elderly. The observations were conducted several times to generalize the findings, including by having informal interview with the users.

Zone A

Zone A comprises of areas that include the main entrance near the Lorong Datuk Sulaiman 4 street, parking space, par-course, main bridge that connects the entrance and the lake area, and the jogging track. Also, in this zone there are several landscape features such as resting facilities, toilets, store room, guardhouse and administration office building.

Zone A is the zone in which the pathway and jogging track started and ended. Throughout the journey surrounding the lake, there are features and facilities that are exposed to the visitors especially the students towards acquiring the knowledge of landscape architecture, sciences, biology and environment. This zone can be accessed through the walkways, jogging track and cycling track available for users.

No vehicles are allowed to enter the main lake area. Users of this area comprises of all categories which include young children, school students, adults, teenagers and disabled persons who use wheelchairs.

In terms of accessibility for the disabled and the elderly, Zone A accommodates good and accessible pathways for all users. There are not much barriers that deny their movement. However, this zone lacks of facilities such as parking space for the disabled persons. The public toilet units are also in bad conditions with vandalized doors, knobs and toilet equipments. Toilet fittings for the disabled is available; however, it is also been vandalized and it is unsafe to be used. Access to the toilet is not good in which the ramp provided meant for wheelchair users is too steep and not safe. There is no handrail attached to the ramp, which may cause difficulties for the wheelchair users and the elderly.

Parking Space

Parking space in this zone does not provide any accessible parking and a proper drop-off for the elderly and disabled persons. According to the Malaysian Standard, there should be at least one unit of accessible parking in every 25 parking spaces. The minimum size for an accessible parking is 3.3m width x 4.8m length. It is proposed that the authority or park management to consider the availability of an accessible parking space mere to fulfill the needs of the disabled persons.

Accessible Toilet

The condition of the public toilet is not really satisfying, and not user-friendly. Even though there is a unit provided for the disabled person, the toilet is not well-maintained. There are toilet equipments that have been vandalized such as the door knobs, water closets and the main doors. These can harm the users especially the children and the elderly. Ramp is provided for the wheelchair users to access but the measurement, size and dimension are not disabled friendly, as it is too steep to be used. As a solution, proper maintenance is

needed to ensure the safety of the users while using the toilet. Facilities for the disabled are also to be improved by making them more reachable and disabled friendly. Accessible toilet should be reachable by having ramp with proper measurement, and it should be installed with handrails on both sides (height of handrail = 900m, Malaysian Standard MS1331:2003).

Pedestrian Walkway and Jogging Track

Walkways in Zone A are generally accessible and are disabled friendly; however it needs some enhancements to make it usable by all disabled persons categories, including the elderly and children. Wheelchair users found in this area expressed their satisfaction concerning their accessibility since there are not many changes of levels, particularly surrounding the main lake. The ground materials used are also in a good condition with concrete paving, which is suitable and do not harm the users and the jogging track offers shock-absorbing rubber material which is safe and suitable for joggers. It is proposed that ramp available to be installed with handrails on both sides of the ramp. To assist the blind, guiding blocks or any textural cues are good to be installed at any necessary locations especially that will direct them to important spaces such as resting areas, public toilets or seating facilities etc.

Zone B

Zone B is the continuation of Zone A, in which among the important features include two secondary entrances that cannot be accessed by vehicles. Other elements include jogging track and pathway that surround the main lake and another route to the secondary entrances. There is also children playground, nearby the main lake and the most attractive element within this zone is the suspended wooden bridge which is situated near the forest reserve adjacent to the main lake area. The bridge directs visitors to reach the end of the journey after making a big round encircling the main lake.

Users may access this area by walking only, and there is no space for vehicles to enter this zone.

Zone B also has other interesting features that attract visitors such as the children play area with a concept Children Adventure Area and Toddler Play Area. There are many spots for family picnic under shaded trees, as well as picnic table and resting chairs. A large portion of this zone is covered by the main lake which is also included in Zone A.

Zone B is dominantly covered by the main lake, in which there are jogging tracks and walkways that surround the lake. Many visitors love to stroll around the main lake to enjoy the beautiful scenery, as well as to look at the beautiful water jets. There are also birds around the lake with fishes and tortoises in the lake that attract young children to stroll around the lake.

Walkways, Steps and Stairs

To measure the accessibility for the users, researchers found out that there are minor problems faced by the visitors. Persons without disabilities, especially those with visual impairment enjoy the lake surrounding while listening to the sound of the water jets. The visual impaired persons also faced no difficulties to access the walkway, since there are railings that can be used for direction and guidance. However, the existence of several changes of levels creates little obstructions and certain conditions might harm the users, too. It is good if there are tactile blocks or any other textural cues installed that are meant for the blind users along the walkway that surround the main lake.

Steps and stairs available are not installed with handrails and ramp for wheelchair or stroller. This creates difficulties and wheelchair users might need assistance upon maneuvering within the area. Any steps and stairs should always be fixed with handrails to ease the users especially the elderly and the disabled. This is also for the safety purposes.

Resting Facilities, Playground and Suspended Wooden Bridge

In Zone B, there are many resting facilities provided: however, most of them are not accessible. Those that functioned very well and are located at a very strategic area and they offer good opportunity for resting and relaxing. Many elderly people with their families prefer to have picnic while utilizing these facilities. Those are generally accessible but not too friendly with the disabled persons with wheelchair, as well as visitors with visual impairment. Some picnic tables are located under shady trees; however, the existing condition of the area does not allow a wheelchair user to reach the resting areas because of the absence of a proper walkway.

So do the people with crutches as well, as they might face difficulties that might harm them. Proper walkway is needed to connect the primary walkway to the resting facilities provided. It is also to consider the movement of the disabled person with wheelchair, as well as the crutches users. Materials should not be slippery and must be wheelchair friendly.

In Zone B there is also a children playground, which is situated at a very strategic location that is at the centre of the park. It can be accessed easily by visitors and children but there is no proper walkway heading towards the playground instead of stepping on the lawn. It is also well designed with shock-absorbed material and it is safe for the children. Enhancements are to be made to ensure that the playground is more accessible and safe for the disabled persons and disabled children. Proper walkway is also needed to be installed from the main pathway to the playground, so that it will be safer for the children and at the same time frequent maintenance works are also to be carried out regularly.

In Zone B, visitors from all categories including the disabled persons love to cross over the existing hanging bridge even though there are other alternative routes. The bridge is somehow safe for the users but the disabled will

need to be with extra care and preferably their presence is to be accompanied. Bridge floor material might be slippery for them, especially after raining.

For the hanging bridge, maintenance should always be done to ensure the safety of the users of the bridge. Materials of the floor must be safe for all.

Zone C

Zone C can be considered as a semi active area, compared to Zone A and Zone B. This is because Zone C has less activities done by the visitors, in addition, only small portion of the main lake is included in this zone. However there are still elements meant for recreational activities such as gazebos, picnic tables, as well as good landscape scenery and vegetation arrangement. Jogging track offers route to the forests area too rather than surrounding the main lake only.

Eventhough this zone is less active compared to the other zones, it can still accomodate with facilities and is consider the disabled's need as well. Among the facilities available include the toilets with one unit for accesible toilet, store room and seating areas. Strollers, joggers and visitors will pass this zone by following the route of the jogging track and return back to Zone B or proceed to Zone A after completing one round of the main lake to reach at the arrival plaza.

Observation was conducted to determine the accessibility for all users in this zone. Many users of the parking, particularly in this zone, do not face problems in accessing space. There are facilities which fulfill the needs of the park users such as public toilet with one accesible unit, resting facilities, that is seating area, lamp posts for security purposes, as well as a good condition of jogging track and walkways.

Througout the observation, there are persons with disabilities who are found strolling the area, in which they do not face many obstacles that deny them to access to the whole area. They also commented that certain elements such as the jogging track materials which are not safe and thus need to be

replaced. More maintenance works are to be implemented regularly to ensure the safety of the users when utilizing the park's facilities.

Seats are located at strategic locations, that is along the jogging track and walkways. There are seats postioned every 80 to 100 metres. However, the access to the seating isnot disabled friendly, especially for the wheelchair user.

Public Toilet and Pedestrian Walkway/Jogging Track

The existence of public toilet with one unit of accessible toilet creates good environment that caters to the users' needs while enjoying the park and its surrounding. The toilet building is completed with ramp for easy access for the wheelchair user, and the unit of the toilet itself suits the requirement of the Malaysian Standard, according to the park management officer. Ramp available is proposed to have handrails on both sides of the ramp, to ease the movement of the wheelchair user, if they are moving by themselves. There should also be a signage to indicate the existence of the accessible toilet.

For the jogging track, there are not much trouble faced by the users, however, the rubber material for the track itself should be repaired or well maintained. There are certain spots that the researcher found where the rubber materials are in a bad condition which may harm the users, especially the young kids and the disabled. It is proposed that frequent maintenance works to be conducted, especially for the walkway and jogging track rubber material. This is meant for safety to all users. Generally, walkways and jogging tracks are in a good condition, and are accessible by all.

Resting Facilities

Resting facilities are located at strategic locations within Zone C. Seating provided to offer resting activities that are used by the elderly, children, as well as the disabled persons. Access to these hardscape features are not really disabled friendly since there are minor barriers that possibly may harm the users such as small drains and its gratings. Generally, the

seats are in good condition and are safe to be utilized by all users, with good locations placement. To improve the condition, access to the seating should be at the same level or slightly higher from the main walkway. It is meant to ease the movement of the people especially those who frequently use this feature, especially the elderly and the disabled. It is also recommended that tactile block or warning block be installed to assist the blind persons to reach to any seating desired.

DISCUSSION AND EVALUATION BASED ON THE CRITERIA OF A SUCCESSFUL PARK

Accessible to park users; vehicular, pedestrian

There are ample parking spaces for the users to park their vehicles. However, there is none for the disabled users. The pedestrians are able to reach most parts of the park. However, certain steep paths are not accessible to the wheelchair users. Signage indicating the forbidden areas for the wheelchair users is available.

Figure 4.4:
parking space in Zone A

Figure 4.5:
Walkway in Zone A

Outdoor activity

The park provides enough space for group outdoor activities. The users are able to use the space for their special group relaxation. Tai chi group is able to perform their ritual. The aerobic group has a special platform to perform their dancing and exercising activities.

Figure 4.6:
Outdoor activities

Aesthetically welcomed from outside and inside

The recreational park is natural with greenery. In addition, landscape architecture is well maintained for the users to appreciate the beauty of nature. Natural lake and river besides man made waterfall and fountain add the aesthetic value to the park.

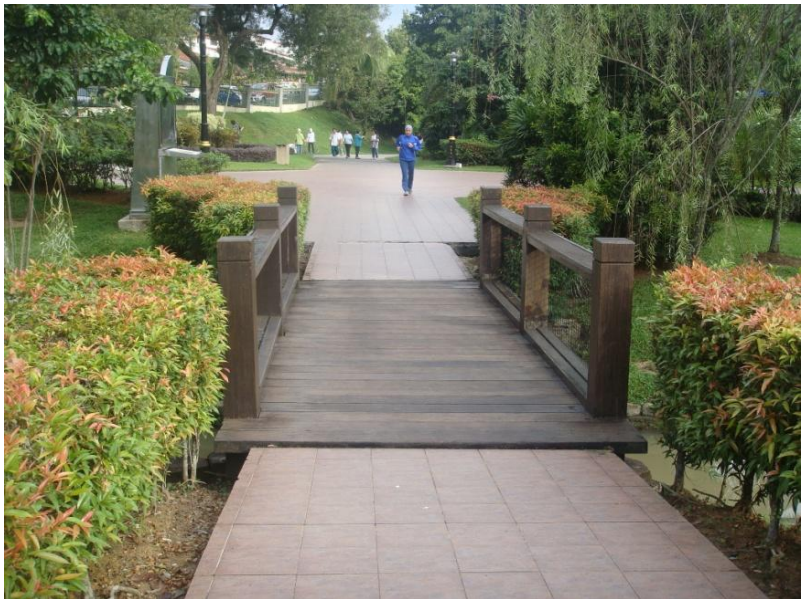

Figure 4.7:
Aesthetic scenery

Equipped with appropriate facilities and amenities

Two accessible toilet facilities are available for the users. Both are accessible to the disabled. However, the toilet in Zone A has been vandalized. Therefore, they need to be repaired. Wooden hanging bridge is available and accessible for all users to explore the nature.

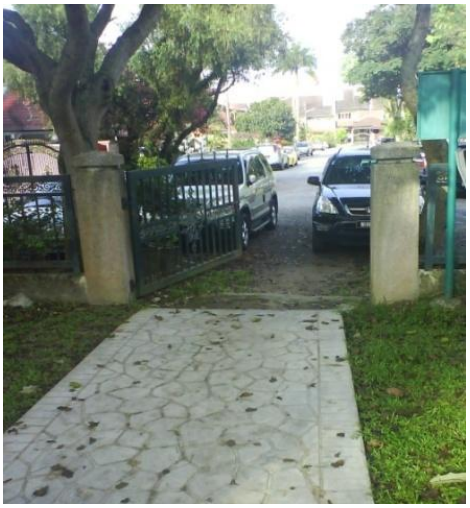

Figure 4.8:
Facilities provided for all

Provide the sense of security to park users

The recreational park is equipped with guard house where security officer monitors the safety and security of the park the whole day. Lighting is available at strategic areas. However, the park is closed between 7.00pm to 6.00am. This is done to ensure security and safety of the area.

Figure 4.9:
Guard house

Promote and improve health condition albeit perhaps contemplating, exercising, etc

The park provides special space and equipment for exercising. The pathway was built to ensure that users are able to stroll, walk or jog according to their ability.

Figure 4.10:
Exercising area

Activities proposed should target on the user's needs

Facilities are provided for the children. They make good attraction for the children, with children adventure area and for toddler playground. Parents and guardians can supervise their children. The facilities are well kept and maintained. Cleanliness is also observed.

Figure 4.11:
Adventure and play area for children

Ability to offer diversified activities in order to cater all types of users

There are many spots for family to relax and have picnic together. The picnic tables and resting chairs are built under the shade to protect them from direct sunlight. The facilities are also well maintained.

Figure 4.12:
Facilities for diversified activities create a space
that provides calmness and comfort regardless
of issues, such as climatic, population and location

Nature lovers are able to appreciate the beauty and the calmness of the area. The users are able to do their own work without being disturbed. The place is quiet enough for them to concentrate on their personal activity.

Figure 4.13:
Peaceful and tranquillity

Accessible to disabled, elderly and children

On the whole, the park is accessible to all (the disabled, elderly and children). However, certain places such as the stairs need to have railing for the users to hold on to. The wheelchair pathway should also be provided with railing to ensure the safety of the users. This is because the gradient of the pathway is rather steep.

Figure 4.14:
Need improvement for users

Relate the park design to any suggested requirement implemented by Ministry of Health, i.e., therapeutic space, reflexology

The users are also provided with natural reflexology treatment. The users are able to walk on the healing stones implanted in the designated area. Therefore, this has become a therapeutic space for the users without having to pay for it.

Figure 4.15:
Therapeutic and reflexology area

Provide activities and facilities, which are suitable for the surrounding and the users themselves

Hanging wooden bridge built across a river with manmade waterfall provides facility for the users without disturbing the terrain of the landscape. Close to the hill with secondary forest makes the sight soothing and calming.

Figure 4.16:
Hanging wooden bridge for users to appreciate nature

Allow users to assimilate the space offered; create the sense of belonging

The users are allowed to use any part of the park for their own activity. Many would find beautiful site to relax together with their family. They can use their own sweet time to accomplish their work. Disturbance is minor.

Figure 4.17:
Togetherness

Economically and low maintenance in the long run

The park is free for all. However, maintenance needs to be done. Therefore, some form of income has to be generated, even though DBKL has fully managed it financially. Being naturally developed, maintenance is minimal. This is because natural secondary forest has been ecologically maintaining itself.

Figure 4.18:
Income for maintaining facilities

Stress on facilities, amenities, activities proposed must be equal and balanced in terms of design and budget imposed
The landscape and environmental design planned for creating balance to the park, with both natural and manmade facilities blend together. This adds aesthetic value and usability of the facilities and amenities. Hence, since the nature is not much disturbed, the financial implication is minimal.

Figure 4.19:
Balanced design

SUMMARY

The research found that the accessibility in the case study area is satisfactory, however, there are many improvements needs to be suggested to fulfill the needs of all users, including the disabled persons as well as the elderly and the youngsters.

Based on the observation and interview access to important spaces such as toilets, public facilities, picnic tables, gazebos and other related elements should be improved. The improvements should also be applied to the existing materials of the flooring, especially the rubber mat at the jogging tracks. Frequent maintenance works should be conducted to ensure the safety of the park users.

Based on the 15 criteria needed for a park, as mentioned earlier, Taman Rekreasi Kiara achieved most of the criteria, and with a satisfactory level. Taman Rekreasi Kiara is accessible for vehicular and pedestrian. It is also convinced and proper to conduct outdoor activities, with its aesthetic values that attract the visitors. In addition, the park provides good facilities and amenities, and it has the sense of security. Taman Rekreasi Kiara also promotes health activities by providing reflexology pathways, par course and playground, as compliments to the existing jogging tracks and bicycle tracks to encourage healthy activities. It is also suitable to cater all categories of people which include families, students, children, elderly as well as the disabled persons. However, improvements are to be made on the existing facilities for the disabled in terms of its function and accessibility.

This park creates the sense of calmness and comfort, regardless of issues, such as climatic, population or location, plus the users are assimilated with the space offered that made them feel the sense of belonging towards the park. Economically, the park does not need much financial support for its maintenance works; however, safety considerations should always be taken into account.

The research undergoes a general process of observing people's attitude and their accessibility, and how accessible are they to the park, as well as the elements in it. This

research has proven that the park is suitable to all users from all categories, regardless of culture, age, ability and profession. It is always the responsibility of all people in the community to play their role as best as possible to ensure that the recreational park in the area offers good quality and to achieve the criteria as mentioned, it is advisable to create a recreational park for all.

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CHAPTER 5:
ACCESSIBILITY FOR PEOPLE WITH DISABILITIES (PwDs) WITHIN HOUSING AREA

Aniza Abu Bakar and Norliza Muhamad

BACKGROUND

Housing can be defined as *"...a place in which the basic human activities of sleeping, eating, washing, storage of possessions, social contact, recreation and care within the self-selected household take place*" (Heywood et al, 2002: p.3). The components of a housing development such as housing itself, commercial buildings (business area), institutions such as schools and mosque, as well as open space for recreation imply their importance in giving support and services in one's life. Thus, it reflects or includes the human settlement as a whole (Sudin, 2002).

Housing and its development components play a vital role in one's everyday life, particularly to those who have limited access to venture beyond this locality. It can be said that generally people with disabilities have limited spaces for their activity that affects their ability to live independently as well as their life quality and satisfaction (Phillips, 1999). Hence, problems in accessing these service areas would also mean increasing isolation and may lead to loss of independence (Heywood et al, 2002).

In studying accessibility in the housing environment, Phillips (1999) divided the housing environment into three types or levels, which are:

- the micro-scale - the internal environment such as the home design, access, maintenance and architectural aspects;

- the meso-scale – the internal environment with focus on the local neighborhood including open spaces, recreational opportunities, shops and such; and
- the macro-scale – involves the wider urban space in which localities are situated.

He also claimed that the external environment *has in general been less well researched but issues of accessibility loom large.* This could be due to the numbers of professions and the public-private sector participants involved.

As adapted from Chow (1999), the environmental needs for people with disabilities could be divided into two main areas that are affecting one to another: physical and social. Physically, they need sufficient or optimum space to maintain their independent life; easy access to public transport to maintain mobility as to avoid being confined to their own territoriality; availability of social services as to maintain healthy living such as health clinic and such; and last but not least – recreational facilities and open space with suitable facilities to accommodate their disabilities.

Looking from the perspective of the social aspect, they need a choice of living arrangements to maintain harmonious relationship with their family members; interaction opportunity with the neighbors; a community that is developed to be sensitive to their needs and regard them as full members of the community with their own rights and responsibilities; and a community that cultivated spirit that respect people with disabilities. As such, he further emphasized that the planning mechanism should pay attention to the special needs of this group; with planning effort that involved a multi-disciplines; with aim to provide opportunities for them to choose their lifestyle; an integrated effort for the betterment of life quality; and the ultimatum – to create a secured environment that avoid people with disabilities from isolation and segregation.

Looking from the perspective of community mobility, integrated infrastructure is needed. Pedestrian infrastructure within a housing area must include ramped curbs, optimum sized sidewalks with hospitable surfaces, protected roadway crossings, rest areas with benches spaced reasonably along routes, sheltered bus stop, textured curb cuts and color contrasted intersections for those with decreased vision (Justiss, 2005). An integrated/well linked pedestrian infrastructure which ensure safety of the user could help to promote interaction among the community members and which could also lead to a great community bonding. It may also give certain sense of control for the people of disabilities as they could be more independent in maneuvering their own lives. Through this integrated pedestrian infrastructure, it may give better opportunity for a quality life of the people with disabilities.

This study aims to investigate the linkages of a housing components – whether or not they are properly linked to be accessed by the PwDs by conducting access audit particularly on its external environment, as well as identifying any difficulties faced by the PwDs to get to one place to another within the housing vicinity, followed by suggestions and recommendations to improve the level of accessibility by the PwDs.

RESEARCH STRUCTURE AND METHODOLOGY

The research involves several stages that include:

- development of the access audit methodology (the Malaysian Standards on the requirement for accessibility for the PwDs were referred);
- access audit training;
- visit to the case study site prior to audit on accessibility;
- the simulation on accessibility of the studied site together with several PwDs that represent the wheelchair user, vision impaired and hearing impaired.

During the simulation, dimensions of design elements were recorded in the prepared checklist as well as photo recording using digital camera. Comments and feedback from the PwDs throughout the simulation process were also jotted down. The simulation was started first at the housing area 1, followed by the mosque, the kindergarten, the housing area 2, the schools (primary and secondary), the open space, and the commercial area. As for the mosque, access audit on the internal parts of the building were conducted which covered the toilet, ablution area and prayer hall. For the commercial area and its buildings, the PwDs tested whether the shop lots can be accessed from the roadside as well as from one shop to another. For the schools, the audit was conducted up to the main entrance only.

TAMAN PAROI JAYA, SEREMBAN, NEGERI SEMBILAN – THE STUDIED AREA

In studying accessibility in a housing area, Taman Paroi Jaya, Seremban, Negeri Sembilan has been chosen. This area was developed in the 1970's to house the government officers initially. This residential has grown into a matured and well developed area for a housing development with its components as shown in the following layout:

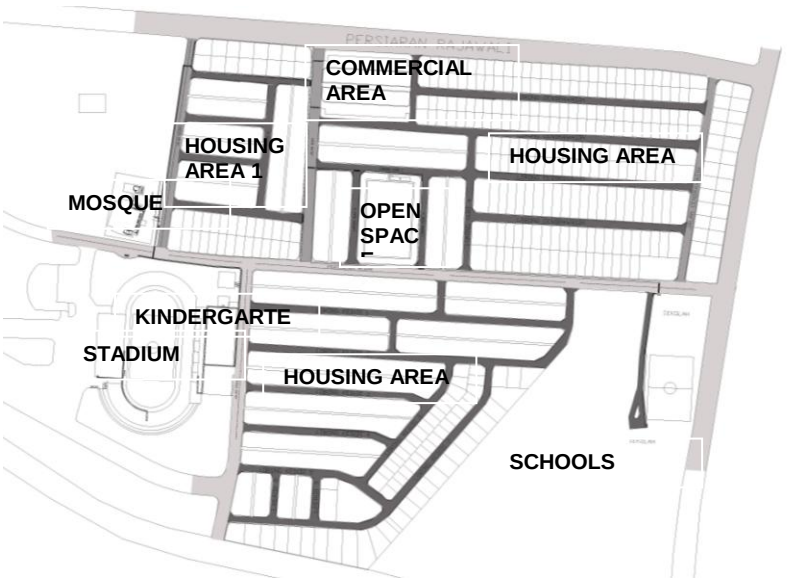

Figure 5.1:
The layout for Taman Paroi Jaya –
showing the housing components.

The road system that linked these housing components are indicated in grey tones with the lightest grey showing the major road, medium grey showing the secondary road, while the darkest grey marked the tertiary road.

FINDINGS OF THE ACCESS AUDIT AT THE TAMAN PAROI JAYA

The findings for the access audit conducted at the Taman Paroi Jaya can be divided into several categories as follows:

The pedestrian linkages and its environment

The pedestrian environment often presents the first obstacles for the PwDs in accessing this area as basically there is no pedestrian network that comprehensively covered the whole

area as it can only be found in certain areas only. Problems encountered were often a combination of faulty or inadequate design and construction practices and inadequate maintenance of the facilities/infrastructure as shown in the following Figure 5.2 as follows.

Figure.5.2:
Not all areas have designated pedestrian pathway (left image);
and pathway not well designed and maintained
(middle and right image).

These challenges include:

- Lack of legible directional signs, street names and numbering. Visual impaired person has difficulties in identifying the streets or the area as well as designated road crossing.
- Lacking of warning marking/tactile for road crossing. Thus, this leads to difficulties to safely cross the road especially for the vision impaired person. It was also found that not many people were aware of the sign given by the visual impaired person as he waved his stick vertically up and down to get motorist to give him way to cross the road.

Figure 5.3:
Image on the top shows the vision impaired person
trying to identify the street's name,
while image on the right shows him waving his stick
vertically to cross the road.

- Obstructed pathway by improper location of street furniture such as road sign, dustbin, telephone booths and such, as well as motorists that parked their vehicles on the roadside/pedestrian walkway.

Figure 5.4:
Improper locations of road sign (top image);

vehicles parked at the roadside as well as on the designated pathway (middle and bottom images)

- Uneven road curbs.
- Dangerous interruption in path of travel

Figure 5.5:
The uncovered manhole can bring danger situation to the users especially people with visual impaired.

- Inconvenient and insufficient width of path
- Changes in level in the pathway that creates difficulties especially for wheelchair users

Figure 5.6:
Changes of level in the pedestrian walkway.

These challenges/problem as outlined above clearly affect the accessibility of the PwDs to those housing components. Having to face the very same problems every single day would 'demoralise' them to live independently and to be with the society.

The mosque in relation to the PwDs and the community

It is the ultimate requirement for a Muslim to worship Allah as can be seen in the meaning of Al Qur'an, Surah 51 verse 56:

> "*And (tell them that) I have not created the invisible beings and men to any end other than that they may (know and) worship Me*."

In Malaysia, a mosque can be said as part of the requirement of planning for housing development. 'Mosque' is well understood as building used by Muslims to perform prayer and in particular the congregational prayers which can be regarded as the most important function of a mosque, on top of being the centre for religious education and to commemorate important event of Islam such as 'Eid celebrations (Mohamad Rasdi, 1998).

Islam strongly urged it followers to perform the five-times-a-day prayer to be performed congregationally. It is also an obligation for every male Muslim to perform Friday congregational prayer during the mid-afternoon, and during the night time of the fasting month of Ramadhan, the Muslim would normally gather in mosque to perform Tarawih prayer. This is the scenario that can be commonly seen in the Muslim community. As a Muslim, it is very important to be 'engaged' with the mosque and its activities and this includes every Muslim including Muslim with disabilities.

According to Muhamad Rasdi (1998), mosque could help cater celebrations and important functions/feasts towards reinforcing the brotherhood of Islam as feasts in the Muslim society are important in several aspects as follows:

- it joins the Muslim community into an intimate family;
- it brings the poor and the wealthy together; and
- to invite people to Islam in a family and brotherly spirit.

By enhancing the accessibility of the disabled person to the mosque, it is actually enhancing their opportunity to be with the society, bonded with the community towards creating a quality and healthy lifestyles for them. Looking from another perspective, it seems to be an 'obligation' for professionals in the built environment to ensure that mosque is accessible for people with disabilities – both internally and externally. These professionals can not be the 'one' that hinders people with disabilities from mosque through its planning and design as they will be answerable to this be it in this world and also the hereafter (at least this is the beliefs of the Muslim).

Among the general problems faced by the PwDs within the mosque area are:

- No provision of parking space for the PwDs.
- Inability/difficulty to identify the main gate/entrance to the mosque compound from the main road, particularly for the vision impaired person.

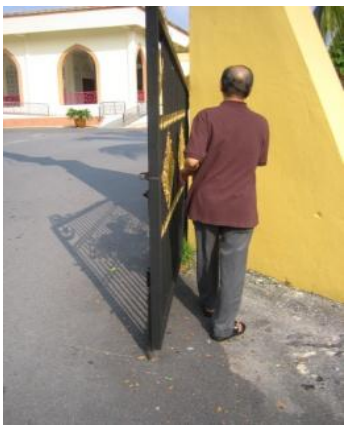

Figure 5.7:
Problem to identify the entrance by the vision impaired due to lack of signage

- Problems in way finding due to lack of signage (embossed signage is needed for the vision impaired) and marking.

Figure 5.8:
The vision impaired did not have
a clue to get to the facilities

- Narrow toilet design with changes of leveling and only squatting toilet provided – cannot be accessed and used by the wheelchair user
- Raised platform at the ablution area – no access for the wheelchair user.
- Improper design of ramp – very steep and/or long ramp with no landing makes it difficult for the wheelchair user to get into the mosque building.

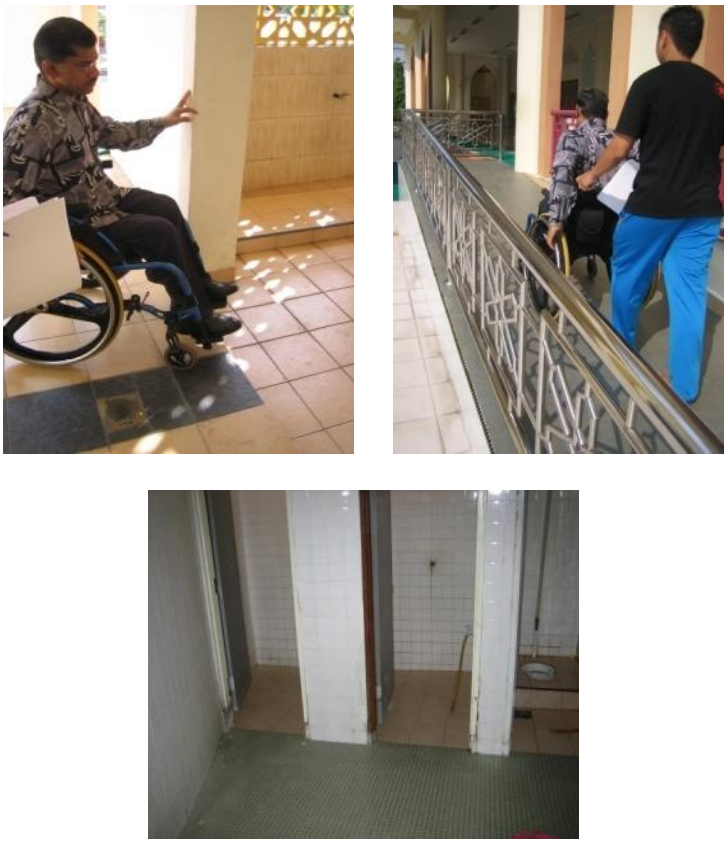

Figure 5.9:
Problems with the narrow and squatting toilet (bottom image), raised platform at the ablution area (top left image) and steep ramp with no landing (top right image).

- Difficulty in identifying the direction of *qiblat* for the vision impaired. Embossed signage would be helpful for them.

As for the vision impaired person, a straight forward linkages and access from one space to another would be better for them as to avoid confusion created by 'zigzagged link' as they will have to memorise more. A mosque indeed plays a vital role in the life of all Muslims. As such, making it accessible for the PwDs would also be an obligation to the professionals in the built environment.

The open space for recreational

The provision of open space is a must in a housing development. As for Taman Paroi Jaya, the open space for recreational purposes is located at the centre of this area. Due to the steep gradient of the land contour, the PwDs especially the wheelchair user can only access this space from the tertiary road via Gate A although there is a gate on its four sides – please refer the following layout for the open space (Figure 5.10).

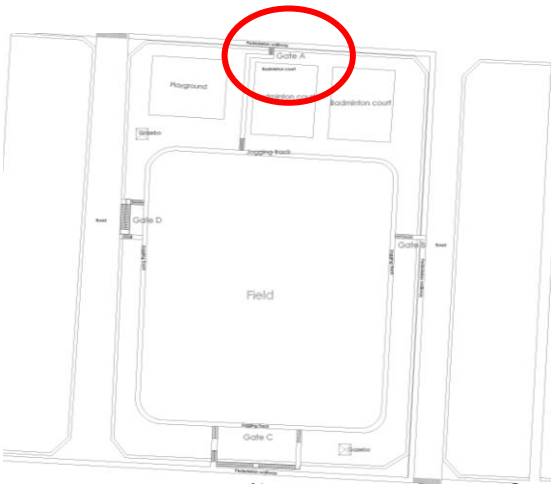

Figure 5.10:
Access for the PwDs via Gate A.

However, the concrete platform provided at Gate A is very narrow and without any handrails which makes it difficult for the PwDs to get through.

Figure 5.11:
Narrow concrete platform at Gate A

There is no designated pathway within the recreational area and thus, it is quite difficult for wheelchair user to maneuver the wheelchair, and for the vision impaired person to find his way. The play structure provided might be unsuitable to be used by children with disabilities too.

Figure 5.12:
The recreational area

Open space provides opportunity for people to conduct their outdoor activities and also for relaxation. As for the PwDs, good access to this area (which also needs to be well maintained) would also means broadening their territoriality other their house unit, thus providing better opportunity to mix with the community.

The commercial area

The commercial area of Taman Paroi Jaya consists of two rows of two storey buildings with various type of business from convenient store, to restaurant and barber shop. Parking spaces are provided in front of these two buildings but there are no clear marking of the lot.

Figure 5.13:
The commercial area of Taman Paroi Jaya

Among the challenges faced by the PwDs in accessing this place are:

- No specific area/clear marking for the PwDs to cross the road (tactile is needed to assist the vision impaired person)
- No designated parking space for the PwDs.
- Changes of level from the road as well as among shops with no provision of ramp (only a few shops have ramps). The surface sometimes also quite bumpy which makes it difficult to maneuver the wheelchair (not well maintained).

Figure 5.14:
Changes of leveling among shops and bumpy surface to the shop corridor.

- Blocked/narrowed corridor as well as shop's entrance with selling items/shop furniture.

Figure 5.15:
Blocked/narrowed pathway of the shops with selling items/furniture

Perceptions of the PwDs on accessibility in Taman Paroi Jaya

Based on the access audit conducted with the vision impaired person, hearing impaired person and the wheelchair user, their overall perceptions on the accessibility at the Taman Paroi Jaya were obtained and they are as follows:

The perceptions of the wheelchair user:

i) *Pedestrian pathway and road junction*

Eventhough there is no comprehensive pathway system, they could still maintain their mobility. However, it is rather difficult for them when it comes to hilly area as there is no handrail for them to hold on to. In order to cross the road at the junction, they faced minimal problems at the secondary and tertiary road as these roads were not that busy with vehicles; compared to the major road where it was busier.

ii) *Access to main spaces/building compound*

The main problem faced in order to access these places would normally be the height of the road curb, uneven surfaces, and narrow entrances.

iii) *Other facilities*

It can be generally said that not many facilities were provided for the wheelchair user. Public phone booth cannot be used by them due to its design and height. Toilet for the PwDs was also difficult to be found. The same goes with designated parking space.

The perceptions of the vision impaired person:

i) *Pedestrian pathway and road junction*

The vision impaired person can still maintain their mobility although there is no provision of proper pedestrian pathway but a well maintained road curb or clear marking of the road lines would help to assist them in way finding. They would also really appreciate it if the road could be well maintained as to avoid them from falling into pot-holes. Enforcement by the authority is most welcome to

avoid placement of construction materials on the roadside as well as parked vehicles at non-designated parking area. Tactile guiding block needs to be located at the road junction as to assist them to cross the road safely. Awareness among motorist must also be instilled so that the vision impaired person can be given their right of way to cross the road once they vertically waved their stick. They could be done via the syllabus imposed on those taking driving license as well as media campaign.

ii) *Access to main spaces/building compound*

Provision of tactile guiding block would help ease their way finding within these spaces. Properly located signage with embossed alphabets would also help them to recognize areas/spaces. Provision of Braille signage would also help them a lot.

iii)Other facilities

The public phone booth cannot be used by the vision impaired person as there was no embossed numbers or Braille numbers for them to identify.

The perceptions of the hearing impaired person:

i) *Pedestrian pathway and road junction*

It can be said that this group of PwDs faced minimal problems as compared to the other two groups earlier. They do not have problem even if there is no pedestrian walkway provided. However, a warning light would help them a lot to cross major/busy road.

ii) *Access to main spaces/building compound*

Bright and clear signage would help this group to identify the spaces/building they are entering as it would be a bit difficult for them to ask other people as not many people are well verse with their sign language.

iii)Other facilities

They can make use of most facilities provided at Taman Paroi Jaya except for the public phone as it did not have the text facilities.

CONCLUSIONS

This study has given some insight on the basic needs for the accessibility of the PwDs within a housing area. They faced several difficulties at certain areas and among others it involved safety issues on top of the accessibility issues studied. Some of the facilities provided may not be appropriate for them. The location of the facilities also seemed to be quite far for them to reach.

As a general conclusion, it can be said that the level of accessibility of Taman Paroi Jaya is not that good and this might be due to its background, where this housing area was developed in the 1970's where perhaps there was no or very little awareness on the needs to provide accessible linkages for the PwDs at that time. However, the condition/situation can still be improved. It is also hoped that the social barriers and physical barriers identified throughout the research could be minimised if not totally omitted.

This study has provided some benchmark for planners, local authority and those concerned in the built environment profession in planning and designing for a housing area which is inclusive for everyone. Looking at the components existed in a housing development, it seems that an integrated effort is highly required among government agencies as well as the private sectors concerned. Implementation of the Malaysian Standards in providing access for the PwDs and enforcement by the local authority is deemed crucial.

RECOMMENDATIONS

The followings are several recommendations that could be considered when planning and designing for the PwDs as well as improving the facilities in a housing area:

Consultation and Participation

Consultation at the early stage of design with local groups representing disabled people such as who use wheelchairs, people with partial sight and others who are blind, people with

impaired hearing and people with cognitive impairment will help in the process of planning and implementing accessible outdoor areas especially in housing areas. It will provide a better understanding of the mobility and accessibility requirements of disabled people, thus can avoid the cost of repairing mistakes. Besides that, the direct participation of disabled people in the development and testing of accessible features in housing areas will be of value in ensuring that what is provided does meet disabled people's needs.

Disabilities Awareness Training

Disabilities awareness training also should be provided and it is essential for the public and also for those who deal with designing, planning and managing facilities in order to ensure that they have a good knowledge of the needs of the disabled users. The training courses should include:

- Barriers faced by disabled people, covering attitude, environment and organization.
- Principles of access audit
- Suggestion for removing barriers faced by disabled people
- Enabling publics to deal with unexpected occurrences
- Communication and interpersonal skills for communicating with disabled people particularly those with the hearing impairment.

Management

The local authorities have responsibility to plan and implement improved access for disabled people. The future improvement in facilities will take place as part of maintenance and repair rather than new facilities are built. Continuing maintenance programmes in the facilities give the opportunity to make improvements in access at lower cost and with less disruption than if the improvements are made separately.

Pedestrian Environment

There is essential that pedestrian environment is accessible for disabled people. Major elements that should be addressed including:

- ***Footways and pedestrian areas***: Should be sufficiently wide enough, have a level surface and be slip free. The footway should be clear from any obstruction, street furniture or overhanging bushes or trees.
- ***Road crossings***: Provide dropped curb or cut curb to allow wheelchair users and visual impaired to cross between roads and sidewalks.
- ***Tactile and audible signals***: Provide continuous tactile guiding block along the sidewalk and at dropped curbs to warn visually impaired pedestrian of the road crossing. Audible traffic signals also important for visually impaired people to identify when it is safe to cross the street.

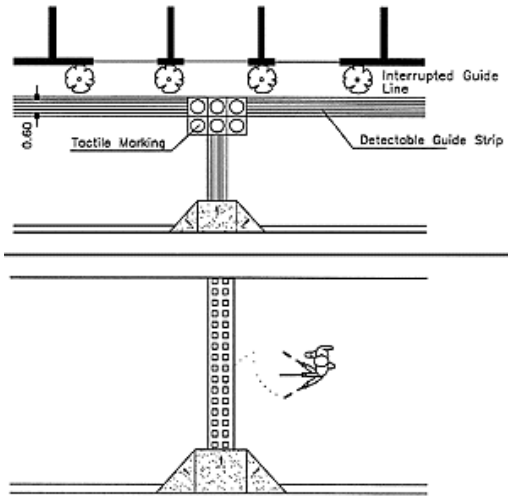

Figure 5.16:
Proving tactile at the proper place for visually impaired people to identify when it is safe to cross the street

- ***Seating***: Seating should be provided at regular intervals to provide resting places.
- ***Signs/ Signboards***: Provide the signs that are contrast with the surrounding surface so as to be clearly distinguished. The signage also should be provide continuously along the walk and should be added to indicate clearly the location and function of accessible spaces and facilities.

Figure 5.17:
Example of signage that should be provided to indicate clearly the location of the facilities

Publicity of Improvement in Accessibility

When a new accessible facilities are built and improvement of the existing facilities have been done, the disable people that who may use and benefit from the improvements should be made aware of them. The method will be vary including the announcement in local press or on local radio, flyers and advertising, and also direct involvement with local organizations of disabled people. Besides that, the information conveys should be available in variety of format. For example the visual impaired people can obtain the information easily.

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CHAPTER 6:
PROVISION OF BARRIER-FREE ENVIRONMENT AT WATERFRONT DEVELOPMENT IN MALAYSIA

Shuhana Shamsuddin, Fadzidah Abdullah, Ruzita Mohd. Amin, Sulzakimin Mohammad, and Che Raiskandar Che Rahim,

INTRODUCTION TO WATERFRONT DEVELOPMENT

Waterfront development is fast becoming one of the recreation areas in the city with the demand for leisure and recreational needs by the increasing urban population.

Paumier (2004) stated that waterfront areas have now become important resources where changes in transportation and development economics have made land and buildings available for reuse. Due to this, a new battleground over conflict between public and private interest occur causing increasing tensions between global capital and local place identity. The regeneration of the waterfront and development became a global concern because rapid urbanisation and introduction of automobiles have turned the once active waterfront into a derelict land, with many dilapidated and abandoned warehouses.

The waterfront development does not only incorporate recreational facilities but has been the target for mixed development such as residential, retail, commercial and institutional use. With its scenic view and close proximity to the city centre, the waterfront is now becoming one of the prestigious sites in the city especially for commercial development. Glazer and Glazer and Delaporte (1980) defined waterfront as port areas of large development that are located on the coasts, along rivers, at the terminus of shipping channels or alongside bays leading inland from the ocean.

Breen and Rigby (1996) defined it based on visual or other connections to the water that is closely related to Department of Irrigation and Drainage of Malaysia's definition of urban waterfront as an area with 50m on both sides from the edges of the river or within two shop lots of buildings. Trancik (1986) categorised waterfront area as one of the types of urban voids, which is a linear open space system that crosses through the district, created edges and linking one place to the other.

Breen and Rigby (1996) categorised waterfront development projects according to their use as follows:

- Commercial waterfront
- Cultural, educational and environmental management
- Historic waterfront
- Recreational waterfront
- Working waterfront
- Residential waterfront.

Ports and dockyards have long dominated the urban waterfront making the areas strictly guarded and inaccessible to the public. Recreation on the waterfront according to Breen and Rigby has become so popular only in recent years.

Kaplan and Kaplan (1982) in Ryan (1998), state that water is an element that has a powerful effect in attracting people. This enables waterfront development to become one of the biggest attractions in any city. Saarinen and Kumpulainen (2005) suggest that the social dimension of urban waterfront regeneration is categorised into four categories: resources and identity, social status, access and activities, and waterfront experience. Of these, social status and access have implications for the people with disabilities (PwDs). Social status concerns about for whom the housing and service areas in the waterfront are planned and built whereas access is about public (including the PwDs) ability to use the waterfront and the types of activities that encourage easy approach to the waters.

May (2006) stipulates that the concentration of activity in the area due to its maximum accessibility for trade, fishing, agriculture and where it was once a main transportation mode makes the waterfront an important public place for cultural development and the nucleus for growth of a city.

Waterfront development that incorporates recreational facilities has an advantage of increasing the quality of life to the people. Carr (1992) refers to Kaplan and Kaplan's study that mentioned the natural setting is capable of giving a restorative experience, refreshing people and sharpening their values, where people experience a sense of wholeness, tranquility and improved self esteem. Existence of water provides a new focus and adds sparkle to urban life, and becomes an element of delight to both adults and children. Hence, the PwDs' access to such development is important in order for them to also enjoy the benefits together with the able-bodied in improving their quality of life.

One of the major problems of waterfront development is the blockage of direct accessibility of the public to the water body due to many development of industrial buildings built at the waterfront area mainly during the industrial revolution. Direct access and visual accessibility are important considerations in achieving legibility for waterfront development. Hoyle (2000) reiterates that one of the most frequent issues being brought up in the development of waterfront is the direct access and visual access to the water edge. These are also the important considerations in making the waterfront areas more accessible to the PwDs group.

Han Meyer (1999) argued that the application of this idea involves design regulations of public spaces and buildings which formed route line with visual and functional diversity, and at the same time 'radiating the sense of uniformity and coherence'. Tibbalds (2001) highlighted that in making a particular place conducive for activities to take place, it must allow clarity in the accessibility to the area, event or facilities.

Lynch and Hack (1984), according to Carmona (2003), has identified access to be one of urban design's main performance dimensions where it relates to the ability to reach other persons, activities, resources, services, information or places including the quantity and diversity of elements that can be reached. Lynch and Hack (1984) also argued that continuity of pedestrian linkage is considered important in bringing the public (including the PwDs) and allowing them to have an integrated activity with the waters.

The other important consideration in waterfront development is comfort, where accessibility for all groups of people including the PwDs, also better known as barrier free environment, is part of the criteria for comfort. According to Slater in Sakar (1985), the definition of comfort comprises of a pleasant state of physiological, psychological and physical harmony between human being and the environment. This includes shady trees, seatings and adequate walkways (barrier free) which is accessible to all groups of people.

The lack of physical amenities in terms of comfort will evoke a negative image and will result in a reluctance to use the area psychologically. When psychological comfort (absence of stressful condition) is achieved this will lead to a general feeling of well being or mental satisfaction that will eventually attract other activities to happen. Hence, in order not to deprive the PwDs group from enjoying the recreational facilities provided by waterfront development, it is imperative that this area is designed to be accessible to this group by providing both physical and psychological comfort to them.

Access audits give a 'snapshot' of an existing building or spaces at one point in time. They are a useful starting point in accessing the current state of accessibility and usability of existing buildings and spaces. An access audit will examine an existing building against predetermined criteria designed to measure the 'usability' of the building for PwDs.

This study aims to audit the accessibility and facilities provided for people with disabilities, in selected case studies, of the following areas;

- Danga Bay, Johor Bahru, Johor.
- Kota Kinabalu Waterfront, Sabah.
- Kuching Waterfront, Sarawak

Specifically, the objectives of this study are to investigate whether or not the selected waterfront areas provide barrier-free environment for people with disabilities, to conduct access audit on the interior and exterior buildings of that area, to identify problems encountered by the PwDs people, to ascertain areas that needed major and minor improvement; and to suggest the types and access needed to provide people with disabilities in the area based on the requirements of the Malaysian Standards.

RESEARCH STRUCTURE AND METHODOLOGY

Data Collection

The study involved several stages of investigation and data collection process:

Stage 1

A survey of literature and desk research on the accessibility requirements for PwDs as well as the Malaysian Standards requirements was conducted. A checklist of items and requirements for the access audit exercise is developed and refined for use during the data collection.

Stage 2

A site visit to each of the three waterfronts to perform a preliminary identification of possible problem areas that may be faced by PwDs was undertaken in preparation of the actual access audit. The waterfront site maps were also obtained from the management offices as a source of reference during the access audit.

Stage 3

The actual access audit on-site was performed together with the participation of PwDs with four types of disabilities, namely, the wheelchair users, those using crutches, the vision-impaired and the hearing-impaired. The waterfront areas were divided into several zones to facilitate the physical survey and measurements. The physical survey is limited to the external environment outside buildings, although entrances from the outside area into the building are also examined. The dimensions and measurements of the design elements and facilities provided at the waterfronts are recorded and compared with the Malaysian Standards for PwDs according to the checklist developed earlier. The elements and facilities include the main walkways, public toilets, paving, ramps, drop levels, curbs, materials, landscape elements and street furnitures. Feedbacks from the PwDs were also recorded as part of the data collection process. The difficulties observed and the conditions that restrict access were recorded using camera.

Stage 4

A focused interview was conducted using a structured questionnaire with PwDs with the four types of disabilities.

Stage 5

An interview with representatives from the waterfront management offices was conducted to seek their views and determine their level of awareness on the needs of PwDs.

Instruments

Questionnaires and Interviews
Two sets of questionnaires were utilised for interviews during the access audit, i.e., for the PwDs, and for the management authority.

Measuring and other equipments
Measuring equipments such as measuring tapes, leveling, cameras and sketchbooks were utilised to take the necessary measurements of dimensions to be recorded.

ANALYSIS OF CASE STUDIES

Danga Bay, Johor Bahru, Johor.

Figure 6.1:
Location of Danga Bay, Johor Bahru.

Danga Bay is the largest recreational area in the Johor Bahru city centre with the State of Johor providing facilities for both active and passive recreation. Previously known as Lido beach, it is located along the banks of the Straits of Johor and spreading across 1,8000 acres of land with 25km of waterfront shoreline. Danga Bay (or Teluk Danga) is a 562ha integrated city development project, which comprises a total of five components namely residential and commercial centres; education hub; medical centres; financial hub; and, sports and recreation. Many interesting events are held there especially during festive seasons. Danga Bay is also sometimes referred to as the Vision City of the South.

The area covered for the case study is a 3 km stretch of land, formerly a mangrove swamp along the straits of Tebrau. The Danga Bay is one of the most popular and prestigious mixed use development in the southern part of the region. Although located about several kilometers from the Johor Bahru city centre, it is highly accessible because of its location along one of the major routes into the city from the north. Danga Bay can be accessed from Skudai Highway (Federal route 1) via the Danga Bay interchange which becomes Jalan Skudai Route J1, which is located near Istana Bukit Serene. Those coming from Singapore and Johor Bahru city centre can access Danga Bay via Jalan Skudai.

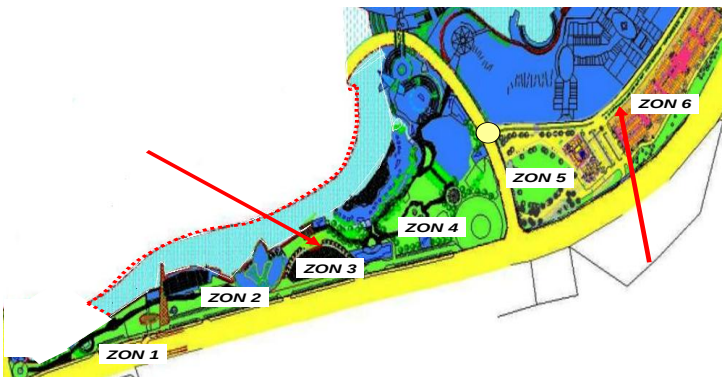

Figure 6.2:
Map of Danga Bay

The waterfront development of Danga Bay was prompted by the trend of waterfront development worldwide where the waterfront's potential as a major public place and mixed used development is exploited. Its location, which is parallel to one of the major routes into the city center, provides easy access that is vital for any commercial development to be viable. As a private development, this area provides recreational facilities to the public where its playgrounds and theme park facilities generate income to the developer. Its development has resulted in better visual access into the river which was once blocked by the dense mangrove swamp which used to line up the river. Fronting the stretch of the promenade is an elite residential areas, government quarters which houses the top ranked civil servants in the state.

The access audit for the PwDs was limited to the area consisting of the entrance next to Lido Beach up to the retail development area called the Festive Street Mall. Hence, the commercial development consisting of shop offices adjacent to the Festive Street Mall and condominiums at the other end of the Danga Bay are not included in the survey. Some parts of the waterfront in this area are still undeveloped and are used as temporary parking sites.

The stretch of the Danga Bay towards the city centre is more dedicated to recreational use consisting of a promenade along the river, restaurants, theme park, children playground, man-made beach, jetties, thematic gardens, mini zoo, food stalls, public toilet, paved courts for outdoor games and car parks. The Danga Bay was envisioned to be a world class urban recreational grounds providing for the recreational needs of the Johor Bahru and its hinterlands population. The current development is a sharp contrast from its original mangrove swamp conditions which limit both physical and visual access to the waters. Due to its prestigious status and being one of the major recreational spots for the region, the inclusion of Danga Bay as one the sites to be investigated for access for the PwDs will highlight the extent of the problem of the PwDs to gain access to recreational areas.

Findings of the Access Audit at the Danga Bay

The overall Danga Bay development is fairly accessible to the PwDs with certain areas such as the Rumah Limas and the fair-grounds being not accessible by them. This is due to the paving materials and presence of obstacles that restricts movement by wheelchair users and those with crutches. The absence of tactile guiding blocks in the area meant that the vision-impaired person will have difficulties in orienting himself in the area. The other constraint observed is the mixture of vehicular and pedestrian traffic along the promenade that makes it dangerous for the hearing-impaired who cannot hear vehicles that come from behind. Some parts of the water edge as in Zone 1 near the Lido Beach area, are not fixed with railings making it dangerous for the vision-impaired. The choice of paving materials also makes this part of the development not friendly to wheelchair users and those with crutches.

Danga Bay can be easily accessed by private vehicles rather than public transport as there is no pedestrian crossing along the busy Jalan Skudai although a bus stop is provided opposite the entrance near Pantai Lido. The absence of designated parking for the PwDs near the entrances makes it difficult for those who arrive by themselves without any assistance. The signboards at Danga Bay are also not made according to the MS 1331:2003, MS 1184:2002, MS 2015: Part 1-4: 2006 and therefore making it hard for the PwDs to make their way in and around Danga Bay. The long stretch of the development will impose demands on them if they were to enter from the wrong part of the waterfront as not all areas are accessible to the PwDs. The lack of signage indicating the master plan of the area and the facilities provided for the PwDs exacerbate the problem further. It would be very helpful if every entrance to the development is sign posted and information is provided to assist in finding their way around the place.

The Promenade

The main path along Danga Bay is the promenade that is wide and accessible for the PwDs, especially the wheelchair users. Meanwhile, at the Bay Leaf Court, the use of wood as paving surface that is not properly maintained creates a lot of hazard to those using crutches and wheelchair as well as the vision impaired due to uneven surface. The ramp at the International Restaurant is also made of wood, where it is quite steep for the wheelchair user to utilize (as stated to the MS 1331:2003, MS 1184:2002, MS 2015: Part 1-4: 2006, slope of 1:12).

Guiding blocks are also not available to guide the vision-impaired to move in and around the Danga Bay. The width of the promenade is between 8 to 13 meter and in accordance to MS 1331:2003, MS 1184:2002, MS 2015: Part 1-4: 2006. The hand railings along the water edge fronting the Bay Court Leaf is too low to be of comfort to the vision-impaired. Since only this part of the promenade was equipped with railings along the water edge, the rest of the water edge is exposed and thus can be dangerous for the vision-impaired. The other problem faced by the vision-impaired is the presence of many obstacles in the grounds, such as the roller coaster columns near the theme park, located along the promenade.

The promenade is not exclusively for pedestrians as vehicles such as mini trains, bicycles and staff vehicles also share the promenade with the pedestrians. This is a problem to the hearing-impaired as they may not be able to know if there is a train coming from behind as no special lane is provided for the vehicles.

Figure 6.3:
The Promenade

Festive street mall in Zone 5 is a hit amongst tourists and locals alike with the country's first ever purpose-built 280 lots shopping street. Shopping here is a must for those in need of retail therapy or even for those who want to experience a touch of local charm and culture. There is a tram/small train available from International Restaurant to the Festive Street Mall. Alternatively, one can drive and park close to the stores with the ample parking space provided but with no parking space allocated for the PwDs.

The trees planted along the sidewalks of the Festive Street Mall are without any railings or grating making them an obstacle to the vision-impaired. The landscape features such as huge boulders near the entrance of the Festive Street Mall also serve as a dangerous obstacle to the vision impaired. There is also a vehicular access between the theme park and the Rumah Limas but no pedestrian crossing was provided, making it dangerous for the vision-impaired and wheelchair user to cross.

Figure 6.4:
The part of the promenade which is not provided
with railings that separate the path and the open drain

Figure 6.5:
Inappropriate paving materials that limits access

Johor's rich culture, arts and heritage can be experienced at Rumah Limas. The eight districts of Johor are represented by the uniquely designed traditional houses where the respective cultural shows unique to each district are performed. However, it is not a disabled-friendly environment. This is due to the use of grass and pebbles as part of the paving materials that prevents wheelchair users from entering the area. Since all the houses are built on stilts, wheelchair users are can only view these houses and its grounds from the sidewalks surrounding the site.

It is observed that there is still lack of sensitivity towards the drop levels between the kerbs and the road surface as well as at the door entrance and the pavements. This is most prominent in the stall areas near Rumah Limas and the Festive Street Mall. The Rumah Limas is also not friendly to the vision-impaired because of the landscape features such as ponds without any barrier that the vision-impaired can easily fall into the pond.

Public Toilets and Other Facilities

There are 3 public toilets designated for the PwDs (Bayleaf under re-construction, celebration ground and festive mall). However, the signboards indicating public toilets are not made according to the MS 1331:2003, MS 1184:2002, MS 2015: Part 1-4: 2006 and therefore making it hard for the PwDs especially the vision-impaired to find it. Even though it is quite easy for the PwDs to make their way into the toilet, however for the wheelchair user, it is quite a struggle to maneuver from the pavement into the toilet due to the drop that is higher than those stipulated in the standards. The door of the toilet cubicle near the Bay Court Leaf Court is too small to enable the wheelchair user to get through. Even if the person is able to enter the cubicle they will not be able to maneuver themselves in the cubicle due to its tight space.

Figure 6.6:
Inappropriate drop for entrance to toilet
at the Festive Street Mall

The other toilet near the Festive Street Mall is also not accessible to the wheelchair user because of the huge drop and absence of ramp. The arrow in the picture shown in Figure 6 indicates the drop that is too high (more than 8cm) and therefore making it impossible for the wheelchair user to get into the toilet. The toilet cubicle itself, although being labeled as a toilet for the PwDs, is too small to allow for easy maneuver by the wheelchair user. Hence, despite the presence of grab bars built inside the toilet for the PwDs, the size of the toilets failed to accommodate the wheelchair user. The vision impaired will also find difficulties to access the toilets due to the absence of tactile blocks to guide them to the toilet and the absence of suitable signage with Braille letterings.

The public telephone provided is also not reachable by the wheelchair user with no facilities and Braille letterings for the vision impaired. Street furnitures are not built for the PwDs as there are no indicators to show their location. Moreover, most of the furnitures are not suitably located and are not accessible for the PwDs to fully appreciate them.

Researcher's Remarks on Danga Bay Assessment

The Danga Bay waterfront development is a busy place during the festive season and public holidays and therefore is less frequented by the PwDs due to the presence of the large crowds. According to the management and staff, very seldom do they receive visitors from the PwDs group except for some schools for the handicapped children who come as an organised group. Even then, they do not venture through the development area preferring to go to selected parts only in the mini train to avoid the crowds.

The response from the PwDs involved in the audit indicate that they will not come to the place on their own unless accompanied by able-bodied persons to assist them due to the sheer distance of the promenade and the lack of facilities and detailed design that is sensitive to their needs. Interviews with the management representatives indicate that they are not aware that the facilities provided are not accessible to the PwDs. However, the management adopts a policy of having their staff to assist any of the disabled visitors who visit the place such as allowing them to park their vehicles in front of the building entrance.

It was highlighted that the area do not receive many visitors from the PwDs group that they do not give much priority to their needs. Since the most basic facilities, i.e., the public toilet is not accessible to the wheelchair users and the vision-impaired it is not surprising that very few PwDs visit the place. The large crowd that frequents Danga Bay over the weekend is also a deterring factor since it is more difficult to maneuver themselves in the large crowds. The absence of guiding blocks and the presence of many obstacles is also a deterrent to the vision impaired to visit the place on their own.

The Danga Bay Waterfront, although boasted that it provides world-class facilities, still lacks in terms of meeting the needs of the PwDs. This is unlike the waterfronts in other parts of the world such as Sydney, Bristol, Brisbane, London, etc., where considerations of the needs for the PwDs is integrated in the design.

The major problem observed in the design of the Danga Bay Waterfront is the lack of attention to details in terms of drop levels, ramps, curbs and paving materials. Being a private development project, the management does not feel obliged to provide the needs for the public especially the PwDs.

Kota Kinabalu Waterfront, Sabah.

Kota Kinabalu is a city with high tourists attraction being the capital city of Sabah, and it is equipped with beautiful surroundings. The area selected for the access audit is commonly known as the Philipino Market among the locals, as many Philipino immigrants work as traders in the area. Besides, this waterfront area is considered the main tourists attraction in Kota Kinabalu as it has facilities for all levels of accommodations, eating outlets, markets for local and foreign goods, and recreational areas. Based on a report by the Kota Kinabalu city council; the area is divided into three sub-areas, namely, the Segama Waterfront, the Public Market, and the Esplanade Waterfront. Figure 7 shows the subdivision of the Philipino Market.

The Segama Waterfront was developed as a recreational area by the Kota Kinabalu city council in early 2008. Initial observation showed that the area was designed with limited consideration of PwDs. Although there is a provision of ramps for wheelchair users, it was observed that this recreational area could not guarantee the safety and mobility of most PwDs.

The public markets, on the contrary, are progressively developed by "the people," since before. This particular area is considered as having heritage value. Initial observation of this public markets area showed that Universal Design was not considered when it was developed and any attempt by the authority to re-develop the area was opposed by the local traders for reasons that their lives depend on the authenticity of the area.

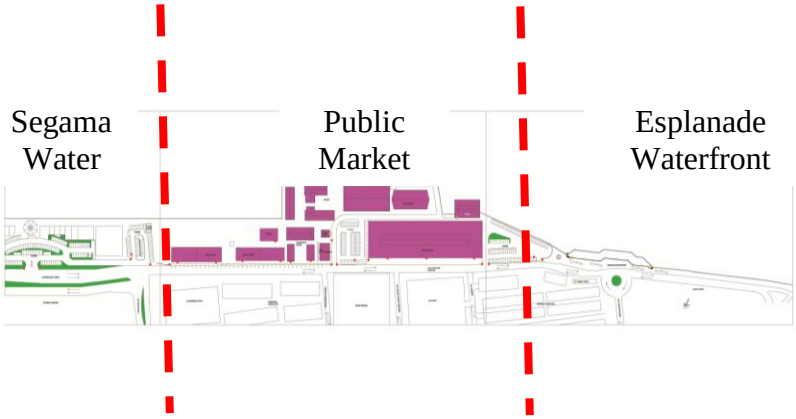

Figure 6.7:
Subdivision of the Waterfront

The Esplanade Waterfront is a modern eatery outlet development designed to attract local and international tourists. Although the city council commissioned the project to professional consultants, the area has no provision of access for mobility of people with disabilities. The existence of the multi-level platform fronting the water area offers no independence for the PWDs to go to this area.

Findings of the Access Audit in Kota Kinabalu.

Exterior Buildings

The parking areas are found to be not in accordance to the requirements specified in MS1331:1993, Section 21.1. There is no provision of accessible parking lots at any of the several parking areas provided at the waterfront, no provision of ramps to connect drop-off point and its surrounding areas, and the curb design is too high for the safety of PwDs. In addition, floors at the parking areas are not evenly surfaced, making the movements of the PwDs unsafe. The authority needs to provide several parking lots for use of PwDs, with safe pathways and ramps leading to the surrounding areas.

Although the area accessed is equipped with taxi drop-off areas and a bus stand, the location and access to both facilities are not in compliance with the requirement of PwDs. There is only one bus stand in a stretch of 1 kilometer long waterfront, and the pathway leading to the surrounding areas is not accessible for PwDs. It is very dangerous for wheelchair users and the vision-impaired to walk on uneven floor surfaces. Bus-stand and taxi drop-off areas need to be equipped with ramps and handrails for the safe mobility of PwDs.

Most of the architectural features in the audited areas are also designed and allocated inappropriately and not in compliance to the requirement as stated in MS1331:1993. Ramps are provided with dangerous gradients, there is not enough provision of handrails, and they are not in accordance to the required size, curb cuts are too high and uneven, pathway surfaces are not continuous and uneven, and there is no provision of block tiles at any point of the area. Renovation of this area with designs that comply to the standards would help to improve these problems.

The PwDs also have difficulties to access common public facilities in the area. Eating outlets are generally accessible by the able-bodied only, with no allocation of ramps to the multi-level eating outlets. Toilets are not well located, where even able-bodied people have difficulties to locate the facility. There is no provision of accessible toilets for wheelchair users, whilst other PwDs use the same toilet cubicles as others. There is not enough provision for resting areas, as most PwDs need resting areas to move around which usually requires more energy and effort compared to able-bodied people. The study also found that pedestrian crossing areas are available but not accessible for PwDs.

In general, the exterior building accessed has too many obstructions for the mobility of the PwDs. Stairs and steps are not provided with proper handrails, safe floor surfaces, warning tactile blocks, and clear headroom. All over the area accessed, there are too many open drains. In addition, there are some decorative design features along the sides of the

pathways and hanging objects from ceilings that pose as obstructions for the mobility of the PwDs, especially the vision-impaired. In this case, the local authority needs to ensure that the public space should always have pathways that are clear of mobility obstructions for the PwDs.

Interior Buildings

There are many entrances leading to the interior of markets, but none of them is accessible for the wheelchair users. Provision of high drops to segregate the exterior and interior of the buildings prevents the wheelchair users from getting inside the markets. There are some ramps provided for the traders to transport their trolleys, but the gradient is too steep for wheelchair users to use the provision. Besides, corridors inside the markets are also too narrow for wheelchair users to maneuver their movements.

Doors inside and outside the building should be designed according to standard requirements for easy entry and exit. However, lack of public awareness has caused the access to be partly blocked by furniture and merchandise. Similar to the exterior building, the interior building of Kota Kinabalu Waterfront also lacks the provision of safe steps, ramps, handrails, and pathways.

Common amenities like public telephones, payment and information counters, resting areas, and praying areas are also not accessible for the PwDs' use. In addition, eating outlets at the upper floor of the main market building cannot to be reached by wheelchair users as there is no elevator provided.

Perceptions of People with Disabilities

The PwDs who participated in this research were generally very concerned with their rights to have equal opportunities on access to the built environment. They gave some suggestions on facilities/items that need to be improved based on their personal experiences participating in the access audit.

The hearing-impaired generally do not have much problems accessing most of the facilities at the Kota Kinabalu Waterfront. The only shortcoming that she felt important to be highlighted was the need to have more proper signage that would enable her to move around without the help of others.

The main problem encountered by the vision-impaired was the existence of too many obstructions on their pathways that pose as a danger to them. They suggested that the design features in both interior and exterior buildings should include the following: guiding blocks, covered drains, steps and stairs with less than six inches height, audio and brailed signage, handrails, and ramps with accurate and appropriate gradients. Especially for the partially vision-impaired, they requested for provision of contrasting-coloured signage. One of the vision impaired participants proposed that Kota Kinabalu should replicate the design of the barrier-free environment in Brickfields, a small commercial area located in the suburban area of Kuala Lumpur, where he could easily move around without any assistance.

Both wheelchair and crutch users who participated in the access audit found that it was very challenging for them to move around Kota Kinabalu waterfront, for the reason that generally the area could not be considered as a barrier-free environment. Comprehensive improvement of the area is needed to ensure equal opportunities for everyone.

Researcher's Remarks on Kota Kinabalu Case Study

The access audit done in Kota Kinabalu concluded that the waterfront area was designed without careful consideration of Universal Design, and renovation of the built environment is urgently needed to comply with the Malaysian Standard requirements. The City Council of Kota Kinabalu has been informally informed on problems encountered during the access audit, and the team of researchers had been notified that a proposal on redeveloping the area is now being formulated, taking into consideration the comments forwarded by the researchers.

Kuching Waterfront, Sarawak.

Kuching Waterfront is a riverside walk stretching about 1 kilometer along the Sarawak River linking the hotel precinct with downtown Kuching. Officially launched on September 3, 1993, the development of Kuching Waterfront was primarily to unlock its potential as a leisure and recreation resource for the future, apart from becoming the landmark and showpiece of the city. Hence, the overall concept of the area took into account the need to provide a mix of community and tourist centered activities while still preserving the historical and cultural setting. The concept influenced the construction of Kuching Waterfront, for instance, in terms of the materials used, the structures, the facilities, and the artworks.

The development of Kuching Waterfront was assigned to the Sarawak Economic Development Corporation by the State Government in 1989. A team of local and foreign consultants was selected to design the project, namely, Conybeare Morrison and Partners (Australia) and United Consultants (Kuching). Construction by local contractors spanned over a period of 2 and a half year (May 1991 to September 1993). During this period, the old riverfront characterized by dilapidated godowns and jetties, dirty mud flaps and eroded riverbanks were transformed into a beautiful landscaped and bustling Waterfront. This metamorphosis has acted as a catalyst to the development and improvement in the adjacent areas in terms of economic revitalization through improved land values, enhanced environment and general amenity throughout the city.

Also called “The People Place”, Kuching Waterfront is 'self-contained' with facilities for entertainment, refreshment, relaxation, cultural enjoyment and arts appreciation. It has also become a popular place for family gatherings, corporate outings, and school and community projects. Kuching Waterfront received three awards in 1994, namely, the National Project Award in the Civic Design Category (Awarded by the Australian Institute of Landscape Architecture), the Merit Award in the Overseas Category

(Awarded by the Royal Australian Institute of Architecture), and the Excellence on the Waterfront/ Waterfront Centre Annual Award (Awarded by the Waterfront Centre, USA). In view of its importance as a tourist attraction as well as a popular destination for various cultural and social activities, it is appropriate that an access audit be conducted to study whether the facilities meet the special requirements of PwDs who are also a significant part of the society.

The access audit was undertaken for the entire stretch of the Waterfront. In order to facilitate the exercise, the Waterfront was divided into four zones (A, B, C and D) as shown in Figure 8. Zone A is an open area with very few landscape elements, Zone B places the amphitheatre and other facilities such as public toilets, prayer rooms and eating outlets, Zone C contains large restaurants and historical constructs such as the Chinese Cultural Museum, while Zone D forms the other end of the Waterfront that links to the hotel area.

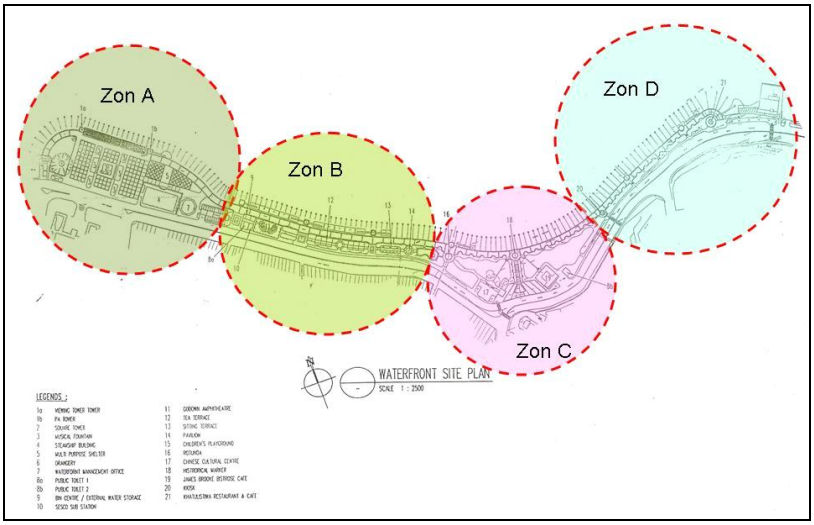

Figure 6.8:
Zoning of the Kuching Waterfront

Findings of the Access Audit in Kuching.

The Promenade

In general, the walkways along the Kuching Waterfront can be accessed fairly well by PwDs. The walkways are wide and spacious, however the rather rough cobble stone surface and wide gratings on drain covers can cause discomfort and difficulties for wheelchair users. The many obstacles along the walkways such as lamp posts, potted plants, food stalls and water fountains without any warning blocks are potential hazard and danger to the vision-impaired. There are safety railings along the riverside which are used by the vision-impaired as a guide, however the railings end in Zone A, leaving a stretch of area where the walkways lead directly to a flight of steps overlooking the river without any warning blocks to caution the vision-impaired of the impending danger (see Figures 6.9 and 6.10).

Figure 6.9:
Obstacles along walkways

Figure 6.10:
Stretch of steps overlooking the river

In numerous places, the paths leading to various facilities and attractions such as historical buildings, shops and viewing towers are linked with steps, which make the attractions completely inaccessible to wheelchair users. The stairs are also without railings, and this causes problems to those using crutches. Ramps as an alternative access are only provided in certain areas such as eating outlets, but not to essential facilities such as public toilets and prayer rooms, which causes great difficulties to wheelchair and crutch users, in particular (see Figure 6.11).

Figure 6.11:
Steps leading to the public toilet

Ramps are provided at the jetties in order to board recreational riverboat cruises, but the gradient of the ramps do not comply with MS1331:2003. The gradient changes depending on the water level of the river and is still found to be very steep even at the highest water level. Numerous gazebos are placed along the promenade but the steps around most of the gazebos make them inaccessible by wheelchair users. Several gazebos should be identified and be made accessible by providing ramps so that PwDs can easily take a rest or seek shelter in case of bad weather.

Other Facilities

Pedestrian crossings that are provided as part of public access to the waterfront are found to be somewhat friendly to PwD users with curb cuts and call buttons. However, in many places the curb cuts are not properly done, i.e., do not comply to the specifications as stated in MS1331:2003 (see Figure 6.12) while in other places there are also bollards and chains across the curbs preventing the use of these crossings.

Figure 6.12:
Uneven curb cuts at pedestrian crossing

Along the 1 kilometer-long waterfront area, there is no taxi stand provided and there is only one designated handicap parking in Zone B, which is actually provided by the local authority, not by Kuching Waterfront management. However, this designated parking space does not comply with the Malaysian standards and there is no continuity of access from the parking area to the waterfront walkways as there is a pavement from the parking area to the promenade. The size of the parking space is only 2500 mm x 4800 mm instead of 3300mm x 4800mm as required, and the wheelchair sign is marked on the ground instead of the preferred standing signage which causes easy and frequent abuse of this facility by non-disabled users.

Figure 6.13:
Existing handicap parking (Zone B)

As mentioned earlier, the public toilet is completely inaccessible by wheelchair and its set-up is not meant for PwD users in all aspects, such as spatial dimension, as well as the material and equipment installed. Similar problems exist for prayer rooms, which are provided only in Zone B. The tight ablution area is connected to the prayer rooms and cannot be accessed safely and easily by PwDs. The doors are too narrow and the raised edge that separates the ablution area to the praying area not only prevents wheelchair users from accessing the ablution area but also poses a danger to the vision-impaired.

Figure 6.14:
Ablution area

The eating outlets/food stalls are fairly accessible to PwDs, but the location of a number of food stalls may cause obstructions to the vision-impaired, and this need to be rectified. The historical buildings such as museums are inaccessible and the design does not take into consideration the needs of the PwDs. Similarly, the riverboat cruises, which are among the major attractions at the Kuching Waterfront are also inaccessible to wheelchair users.

Researcher's Remarks on Kuching Waterfront Case Study

The access audit done together with PwDs in Kuching Waterfront found that the wide and spacious promenade area along the waterfront is generally accessible by them, but the construction of the entire Waterfront barely takes into account the needs of PwDs. The hearing impaired encountered the least problems while wheelchair and crutch users, as well as the vision-impaired encountered the most problems in terms of accessing and locating essential facilities and attractions such as toilets and historical buildings due to the lack of ramps and nonexistence of guiding/warning tactile blocks. In places where efforts are made to provide access for PwDs, the required specifications are not met, hence leaving the problems unresolved.

Feedback from the management revealed that the Kuching Waterfront has not been receiving many visitors on wheelchairs, and this is not surprising since the facilities for this particular group of PwDs are certainly lacking. It is hoped that based on these findings the facilities at the Kuching Waterfront can be upgraded to meet the special needs of the PwDs so that they can fully enjoy the benefits that Kuching Waterfront has to offer. It is also hoped that the proposed new extension of the Kuching Waterfront to be constructed will consciously take into consideration the needs of PwDs .

SUMMARY

This study investigates whether waterfront areas in Malaysia provide barrier-free environment for PwDs by undertaking an access audit in three selected waterfronts. The field work during the access audit also involved the participation of PwDs from four categories of disability, namely, wheelchair users, those using crutches, the vision-impaired and the hearing-impaired. The study found that all the three waterfront areas are still lacking in terms of meeting accessibility needs of PwDs. Among the common problems observed is lack of attention to details in terms of drop levels,

ramps, curbs and paving materials. Public amenities designated for PwDs such as toilets and parking spaces are either entirely nonexistent or do not comply with the specified Malaysian standards. The existence of too many obstructions on pathways poses as an additional danger to the vision-impaired. Both wheelchair users and those using crutches who participated in the access audit found the waterfront area to be very challenging.

Based on the findings of the study, a comprehensive improvement of the waterfront areas is certainly needed to provide full accessibility by all including PwDs, hence, creating an inclusive society. Waterfront development that incorporates recreational facilities not only serves as a tourist attraction but it also provides a means to increasing the quality of life of people. Thus, access to such development for all members of the society including PwDs is important in order for them to also enjoy the benefits of the waterfronts. Adoption of Universal Design in upgrading the waterfront areas would be one of the best ways to resolve accessibility problems. It is high time that enforcement of the regulations on compliance to the Malaysian Standards be fully implemented in the name of fairness and justice for all.

Ensuring full implementation of Universal Design in Malaysia offers challenges and opportunities. For years, implementation has been hindered by lack of full enforcement by regulatory authorities. Overall costs of having dependency of PwDs on welfare and charities are actually higher than providing them the facilities. Calls for awareness and implementation have been heard all around, yet coordination among all parties involved should be made more effective. The time is overdue for all parties involved to translate the research agenda into practice and collaborate fully in the implementation of the Malaysian Standards for PwDs' facilities in the built environment, so that the history of failed practices does not repeat itself. Hopefully, in years to come, there would be no more segregation between PwDs and the larger community through man-made barriers.

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