



PROVISION OF BARRIER-FREE ENVIRONMENT AT WATERFRONT DEVELOPMENT IN MALAYSIA

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ABSTRACT

Development of waterfronts worldwide began in the 1970s, with the commercial success of development in Boston and Baltimore. Waterfront development that incorporates recreational facilities serves as a tourist attraction and provides a means to increasing the quality of life of people. Hence, access to such development for all members of the society including people with disabilities (PwDs) is important in order for them to also enjoy the benefits of the waterfronts. To investigate whether waterfront areas in Malaysia provide barrier-free environment for PwDs, this study undertakes an access audit in three selected waterfronts in Malaysia, namely, Danga Bay in Johor Bahru, Johor, Kota Kinabalu Waterfront in Sabah, and Kuching Waterfront in Sarawak. 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. Hence, a comprehensive improvement of the waterfront areas is certainly needed to ensure full accessibility by all including PwDs to ensure equal opportunities for everyone.

1.0 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:

1. Commercial waterfront
2. Cultural, educational and environmental management
3. Historic waterfront
4. Recreational waterfront
5. Working waterfront
6. 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;

1. Danga Bay, Johor Bahru, Johor.
2. Kota Kinabalu Waterfront, Sabah.
3. 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.

2.0 RESEARCH STRUCTURE AND METHODOLOGY

2.1 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.

2.2 Instruments

1. 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.

2. 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.

3.0 ANALYSIS OF CASE STUDIES

3.1 Danga Bay, Johor Bahru, Johor.



Figure 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.

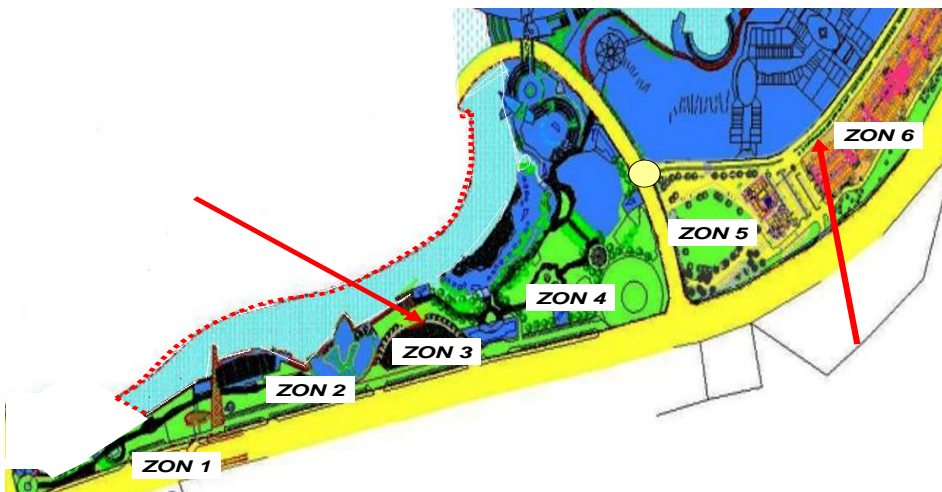


Fig. 2: Map of Danga Bay

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 most prestigious neighbour to this area is the Istana Bukit Serene, the residing palace of the Sultan of Johor.

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.

3.1.1 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 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 4: The part of the promenade which is not provided with railings that separate the path and the open drain



Figure 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 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: 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.

3.1.2 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.

3.2 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.

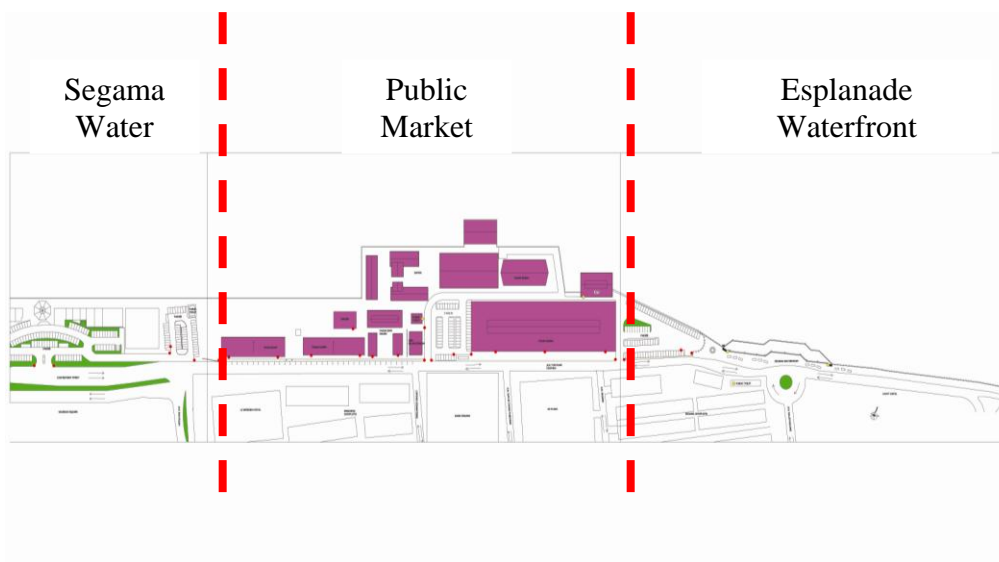


Figure 7:
Subdivision of the Waterfront

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.

3.2.1 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 brailled 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.

3.2.2 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.

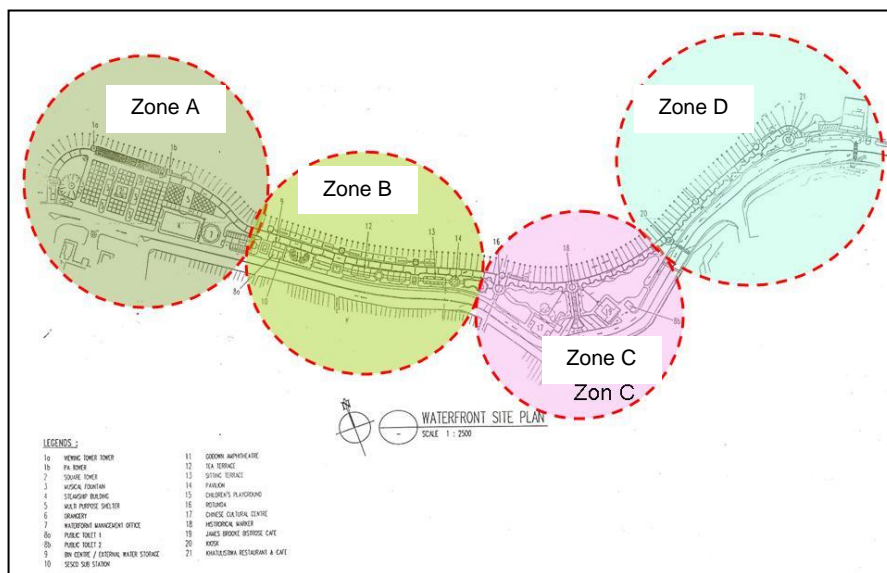
3.3 Kuching Waterfront, Sarawak.

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.



3.3.1 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 9 and 10).



Figure 9: Obstacles along walkways



Figure 10: Stretch of steps overlooking the river



Figure 11: Steps leading to the public toilet

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 11). 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 12) while in other places there are also bollards and chains across the curbs preventing the use of these crossings.



Figure 12: Uneven curb cuts at pedestrian crossing



Figure 13: Existing handicap parking (Zone B)



Figure 14: Ablution area

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.

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.

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.

3.3.2 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 .

4.0 CONCLUSION

This study investigates whether waterfront areas in Malaysia provide barrier-free environment for PwDs by undertaking an access audit in three selected waterfronts in Malaysia, namely, Danga Bay in Johor Bahru, Johor, Kota Kinabalu Waterfront in Sabah, and Kuching Waterfront in Sarawak. 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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