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Rethinking the Neighbourhood Parks of Dhaka city through the Spectacle of Universal Design to Ensure Accessibility for the Differently Abled People

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Abstract

The demand of neighbourhood parks with provision of universal accessibility is an inevitable prerequisite for enhancing quality of life of all people, regardless of their age, size, disability or ability. Lack of universal accessibility neighbourhood parks creates impact on frequency of uses of differently able people. This paper therefore first study the definition and of universal design and accessibility as well as standard guidelines of different countries, and secondly find out the plug-ins that are necessary for creating an environment which can be recognized as universally accessible. A comparative study of standards and guidelines of different countries for universal access to the external environment with BNBC is carried out and an observational field survey has been done, evaluating the six neighbourhood parks of Dhaka city as case studies. Based on the findings, this paper represents a rational layout emphasizing on the universal accessibility to increase the interaction and comfort of differently abled people in the neighbourhood parks of Dhaka.

Keywords: BNBC, Differently Abled People, Neighbourhood Park, Universal Accessibility, Universal Design.

Introduction

We are all physically crippled sooner or later in our lives. Disablity is not a phenomenon but rather a phase. A child, a pregnant woman, a parent with a pram, a person carrying a heavy luggage, an individual with a broken leg or with limited walking abilities, an obese person, an elderly individual, and so forth are all disabled somehow. The individuals who stay solid and capable for their entire lives are not many. The target group of this paper is composed of the following categories: wheelchair users, people with limited walking abilities, the sightless, the partially sighted and the hearing impaired.

Accessibility at any place refers to the abilities and opportunities to reach desired goods, services, activities and destinations. It is ought to be barrier-free and adjusted to satisfy the requirements of all people equally. Making arrangements for the majority implies planning for people with varying abilities and disabilities.

In Bangladesh, the accessibility situation of physically challenged people is not satisfactory. Even in Dhaka, the capital, only a few public buildings have ramps for

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disabled person. When interviewed Salma Mahbub, General Secretary of Protibondhi Nagorik Shangathaner Parishad (PNSP) alleged that even in some ministry buildings there are no ramps or lifts so that a person with disability can go there. Moreover, it is frustrating that even all the hospitals do not have ramps. People with wheelchair do not have easy access to move around by using the pedestrian walkway. The reason for the absence of proper walkway are the illegal parking on the footpath, uneven surfaces, garbage on sidewalks, unwanted obstructions, disordered movement of pedestrians and inappropriately installed ramps are the major deficiencies. (K.K. Akter, The Daily Star, 2017)

The social point of this paper is to integrate disabled people into society with the goal for them to take a functioning part in the public arena like neighborhood green spaces and lead a normal life. To be active physically and mentally, a handicapped individual should be able to commute to the neighborhood parks for refreshment. The focus of this paper is to give a barrier-free environment for the independence, convenience and safety of all people with disabilities.

Objectives

The objectives of the research are:

1) To study the best practices and standard guidelines of different countries for access to the external environment such as green spaces (playfields /parks) and to revision existing regulations in BNBC (Bangladesh National Building Code, 2015).
2) To document the observational perception of the selected parks and of the supplied amenities and their potential to achieve a more desired amenities and services for highlighting the wider benefits experienced by all.
3) To identify the needs of people who require access to the external environment in order to undertake daily activities and to find out optimum operating conditions at which the existing green spaces can be recognized as universally accessible to the general public.
4) To create awareness on accessibility standards and techniques on the various considerations in construction practices for socialinclusion.
5) To encourage designers to look beyond the recommended requirements of national building regulations for Universal design solutions.

Methodology

The method of the study is comprised of 2 stages. In the first stage, people with disabilities in the literature were examined and the problems disabled individuals encounter in urban life and activity were discussed. Additionally, information were collected through joint stakeholder's meetings and individuals living with disability while formulating the guideline in context of Dhaka.In the second stage, spatial findings were reported in order identify the problems and needs of people with disabilities in neighborhood parks.

Similar toEsfandfard, Wahab, Amat (2018) this study employed observation as a means to assess the relationship between the actual practices and the respondent's feedback in

the context of the study.The paper deals with the technical considerations and design measures to be taken into account in the planning of the neighborhood parks. For this purpose, guidelines and standards of different countries around the world were studied and the parameters required to evaluate a neighborhood parks were jotted down. All information is divided into 3 sections:

1) SENSORY CONSIDERATIONS- deals with design requirements for people who are hearing and visually impaired. It discusses with the solutions for parameter: **sensory accessibility**.

2) URBAN DESIGN CONSIDERATIONS- deals with the design requirements of open spaces, recreational areas and pedestrian routes. It introduces solutions to the principal problems in the design of an **accessible outdoor environment**. It is subdivided into 8 Parameters: obstruction, signage, street furniture, pathway, curb ramps, pedestrian crossing, parking, and playground.

3) ARCHITECTURAL DESIGN CONSIDERATIONS**-** deals with the design requirements of **vertical and horizontal access** in neighborhood parks. It is subdivided into 4 parameters: steps/stairs, ramp, handrails and toilets.

After elaborate revision of these 13 parameters under the above mentioned considerations, BNBC was studied to acknowledge the presence of these specific parameters. Then surveys and studies were conducted in 6 different neighborhood parks of Dhaka city. The photographs taken of the survey area and the principles on space design for people with disabilities constitute the main materials of the study.

Literature Review

Universal Design [UD]

Universal design (UD) is also called inclusive design, design for all, or life span design. As initially conceived, UD was focused on usability issues. "The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design" (Mace, 1985). A newer definition is more relevant to all citizens without ignoring people with disabilities. It states that UD is, "a process that enables and empowers a diverse population by improving human performance, health and wellness, and social participation" (Steinfeld and Maisel, 2012). According to Asmervik (2002), the UD concept simply means an attitude or way of considering things, where surroundings, buildings and products are planned and designed so they can be used by everyone to the greatest extent possible. Another important aspect of UDis that, it is very cost effective if considered during the conception phase of design.

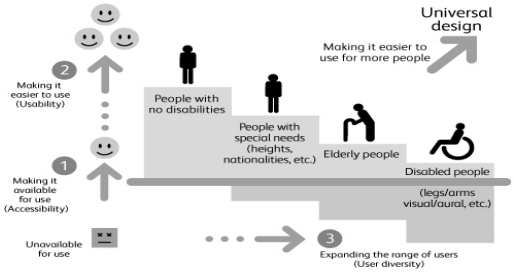


Figure 01: The mechanics of universal design. Source: greatcities.uic.edu/2015

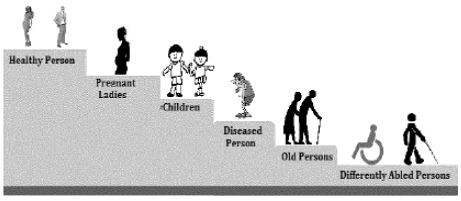


Figure 02: Different Sections of Society who need accessibly through Design (Sharma, 2013)

Table-01: Principles of Universal Design, Source: Kadir & Jamaludin (2012)

Principle	Description
Equitable Use	The design is useful and marketable to people with diverse abilities.
Flexibility and Intuitive Use	The design accommodates a wide range of individual preferences and abilities
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
Perceptible Information	The design communicates necessary information effectively to the user, regardless of ambient condition or the user's sensory abilities.
Tolerance for Error	The design minimizes hazards the adverse consequences of accident or unintended actions.
Low physical Effort	The design can be used efficiently and comfortably and with a minimum of fatigue.
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.

Universal Accessibility [UA]

Universal Accessibility is about giving equal access to everyone. Without being able to access the facilities and services found in the community, persons with disabilities will never be fully included (United Nations, 2007). The factor of accessibility should be taken into account during the project preparation processes and the required and necessary arrangements should be made (Seyyar, 1999).

According to Rahim (2012) and AusAid (2013), there are 4 categories of design requirement which must be considered in designing accessible environment within and between buildings and in outdoor environment (Table-02)

Table-02: Category of design requirement in Universal Design,Source: Rahim (2012)

Requirement	Component
Sensory	Tactile warnings, guide ways and information
Outdoor environment	Obstructions, signage, street furniture, pathways, kerb, ramps, pedestrian crossing, alarms
Horizontal areas	Doors, entrances areas and lobbies, corridors, handrails and railings, bridges
Vertical areas	Ramps, lifts and stairs

Differently Abled People [DAP]

The term 'differently abled' was coined by the US Democratic National Committee in the early 1980s as a more acceptable term than handicapped (or, in the UK, disabled). The

motivation seems to have been both a genuine attempt to view the people previously called handicapped in a more positive light and also as need to be seen as politically correct. The primary factor, it is even a prerequisite, is the need to provide people with disabilities with the same living conditions as everyone else. A properly designed built environment is required to fulfil the needs of people with disabilities.

According to WHO 'differently abled is a person who has impairment that produces functional limitations, restrictions in activities or has social handicap'. An impairment is a problem in body function or structure; an activity limitation is a difficulty encountered by an individual in executing a task or action; while a participation restriction is a problem experienced by an individual in involvement in life situations.

Disability is thus not just a health problem. It is a complex phenomenon, reflecting the interaction between features of a person's body and features of the society in which he or she lives. Overcoming the difficulties faced by people with disabilities requires interventions to remove environmental and social barriers. (WHO)Disabilities fall into four major categories: **visual, physical, hearing and cognitive impairment.** Besides these other categories of people are to be considered for installing mobility aiding features. They are elderly adults, children, pregnant women, and people carrying luggage or pram because of their inability to move quickly to avoid dangerous situations. (Abir & Hoque, 2011).

People with disabilities struggle to be included in our parks and recreation spaces. It is globally recognized that roughly 20% of the world population has some type of condition that impacts their ability to engage in daily life activities. According to Bangladesh Sample Vital Statistics 2016 report, 9 out of every 1,000 people in the country have some form of disabilities with more males (9.8%) having disabilities than females (8.3%). It also found that 6.8% of urban people have disabilities while in rural areas 10.8% have the conditions. In secondary schools, over 8 in every 1,000 students have disabilities [Mahmud Jamil, 2019]. Public green spaces are designed to offer social interaction with all categories of people. For a variety of reasons, users with disabilities often receive limited benefits from these public places:

- The physical design of the infrastructure often neglects disabled people's needs (e.g. footpaths with staircases, inadequately designed toilets, a lack of seating).
- Special infrastructures designed with disablity in mind are often set apart from normal public user. (e.g. disabled people are separated from other green space users).
- Disabled people often encounter able-bodied users who show resentment towards them.
- Inadequate transportation facilities and lack of personal assistance or other means of support causes many disabled people to stay indoors. (SeelandK. & Simone N.)

Neighbourhood Park [NP]

According to DHAKA STRUCTURE PLAN 2016—2035 (pg: 212) "Park - Within urbanized areas, parks are used purely for the recreational purposes. They are of two categories mainly: **city level parks** (from 50- 80 acres) for all citizen and **local parks** (usually less than an acre) for neighbourhood people mainly."

DAP (2010) proposed an optimum standard of 0.96 acre/1,000 population at neighbourhood level park and play field as 0.32 acre/1,000. Compared to DAP, the Private Residential Land Development Rules (PRLDR, 2004,) has prescribed a lower Standard of Park and Playground (0.2 acres/1,000 populations). Thus DAP standard prescribed 1.6 times bigger open space than PRLDR and 2 to 6 times of DMDP (1995) standard (0.16 acre/1,000 populations).

In context of Dhaka, City parks (e.g. Ramna Park) are often larger, and generally boast organised outdoor recreational facilities used by city residents whereas, neighbourhood parks (e.g. Study areas) are often smaller than city parks, and typically serve the local community.

Neighbourhood parks can accommodate a full range of mobility and sensory capabilities for all ages and communities. They provide common areas where residents can engage collectively physically and culturally, and build social relationships through common experiences. This cycle of activity and social interactivity in a public space contributes to the quality of life in a city (Universal Design Charrettes in Blue Springs, Missouri, and Roeland Park, Kansas).

The Sustainable Development Goals (SDG) target 11.7: "By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities". This target is part of Urban Goal (SGD11) that aims at making cities and human settlements inclusive, safe, resilient and sustainable. One other international target set by the WHO (World Health Organization) deals with green spaces, and it states that cities should provide with 9m^2 per capita within 15 minutes of walking distance from their home place.

Table-03: DAP (2010) Proposed Open Space Standards at Neighbourhood Level (for 12,500 People), Source: DAP Reports (2010)

Name of the Facility	Quantity		Area		
	Min. (No.)	Max. (No.)	Minimum for Unit Facility	Sub Class Total	Class Total (Acre)
Open space			**10 Acre**		**12**
i) Park/ children's park	1	2	0.3 Acre	1 Acre	
ii) Water body/ Canal/Pond	As per Planner		1.5 Acre	6 Acre	
iii) Play field	2	3	1 Acre	3 Acre	
iv) Green Vegetation/ Water Front	As per Planner		0.5 Acre	2 Acre	

Table-04: Open Space Standard for DMDP Area for Each 1000 People, Source: DHAKA STRUCTURE PLAN 2016—2035 [Pg.: 213]

Name of the Facility	Standard	Size of unit facility
Open space	**acres / population**	**acres**
i) Park/children's park (local park/ mini park within neighbourhood)	1.5 acre/ 12,500 i.e. 0.12 acres/1,000	Under 2 acres & avg. 0.25 acre
ii) Play field (local play area)	3 acre/ 12,500 i.e.0.24 acre/1,000	3-10 acres
iii) District Park (within city, intermediate scale)	25 acre /100,000 i.e. 0.25 acres /1,000	50-75 acres
iv) Metro Park (urban forests/ natural parks out city or on edge, large scale)	25 acre /100,000 i.e. 0. 25 acres /1,000	150 + acres
Total	0. 86 acres /1,000	

Presence of Universal Accessibity Guildelines /Standards in Different Countries for the Outdoor Environment

Guidelines/standards of different countries around the world for universal accessibility in the outdoor environment were studied and the 13 parameters that are required to evaluate neighborhood parks are collected and compared to the standards provided in BNBC 2015 to find out the absence of parameters that need to be addressed. It is found

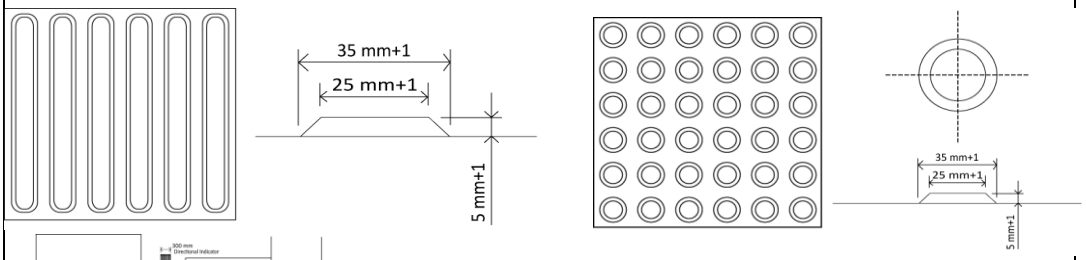
that BNBC hasn no guidelines for street furniture, pedestrian crossing and playground. Table-03 shows the analysis of the above.Table-04 shows summary of standards eligible for NP in BNBC 2015.

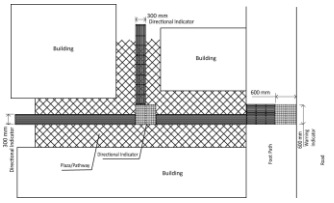
Table-05: Presence of Universal accessibility guidelines/standards in the different countries for the outdoor environment compared to BNBC 2015.

Considerations	Parameters	Australia	North America	UK	Asia	CBM International accessible guide)	BNBC 2015
SENSORY	Visual & hearing	✓	✓	✓	X	✓	✓
URBAN DESIGN CONSIDERATIONS	Obstruction	✓	✓	X	X	X	✓
	Signage	✓	✓	✓	✓	✓	✓
	Street furniture	✓	✓	✓	X	X	X
	Pathway	✓	✓	✓	✓	X	✓
	Curb ramps	✓	✓	X	✓	X	✓
	Pedestrian crossing	✓	X	X	X	X	X
	Parking	✓	✓	✓	✓	✓	✓
	Playground	✓	X	X	X	X	X
ARCHITECTURAL DESIGN CONSIDERATIONS	Steps	✓	✓	✓	✓	✓	✓
	Ramp	✓	✓	✓	✓	✓	✓
	Hand rails	✓	✓	✓	✓	✓	✓
	Toilets	✓	✓	✓	✓	✓	✓

Table-06: Summary of the BNBC standards eligible for NP, Source of all information and figures: BNBC, Final Draft, 2015

Sensory: visual & hearing





- Surface: firm, even, slip-resistant, stable, contrasting color with adjacent walls, free from barriers, obstructions along with physical and sensory cues.

- 2 types of tactile ground indicators -

a. Directional indications.

b. Warning indications: level changes, change of direction, approaching vehicular roads, obstructions etc.

Fig: The pattern and dimensions of warning indicators and its uses

Obstruction

- When an obstacle is more than 100 mm from side walls within the circulation space, then the bottom edge of the obstacle shall not be more than 580 mm above the floor level.

- Minimum clearance for headroom= 2000 mm from the floor level

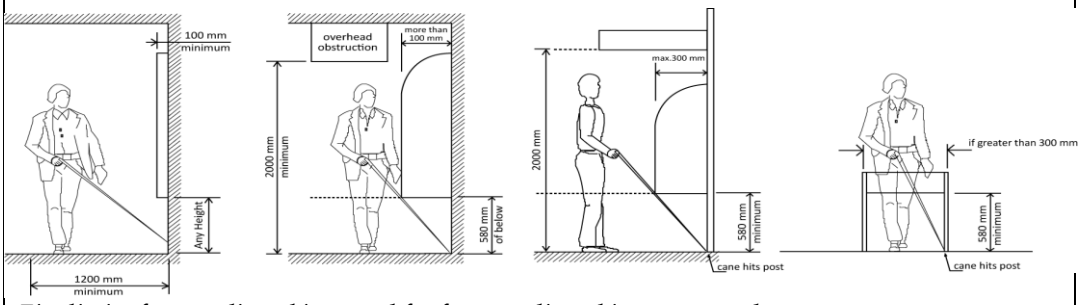
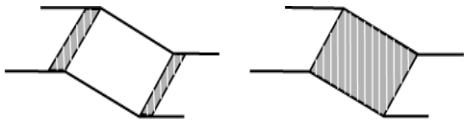


Fig: limit of protruding objects and for free standing objects mounted on post



- For change of level, pathway should have gradient of 1 vertical to 12 horizontal (min) towards the direction of travel. Slopes should have markings with contrasting colors at the top and the bottom of the ramp.

Fig: Markings on an internal ramp

Signage

Letters & numbers in signage: legible, consistent in font style, use 'CAPITAL LETTER's.

Location of Signs: clearly and legibly identifiable. Directional signs where direction changes. The center line of the sign should be 1500 mm above floor level.

Tactile Characters or Symbols: mounted in height, sized between 16 mm- 50 mm, raised 0.8 mm (min) above the background surface.

Braille and Pictographs: Braille- located below the text/arrow in a signage. Easy to touch and read.

Signage for parking: Symbol- painted in contrasting color at the center of parking stall, dimension between 1000 mm x 1000 mm to 1500mm x 1500mm.

Required viewing distance (m)	Minimum height of letters (mm)
1.5	50
2.0	60
2.5	100
3.0	120
4.5	150
6.0	200
8.0	250

Viewing distance (m)	Symbol size (mm)
Up to 7.0	60 x 60
7.0 to 18.0	100 x 100
Above 18.0	200 x 200 to 450 x 450

Street Furniture: No standard found

Pathway

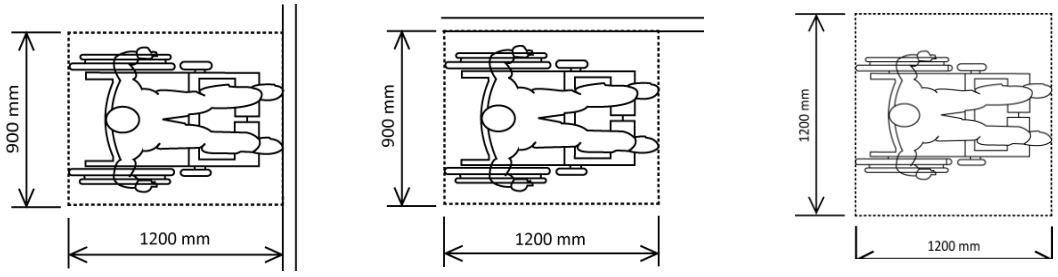


Fig: Minimum clear floor space

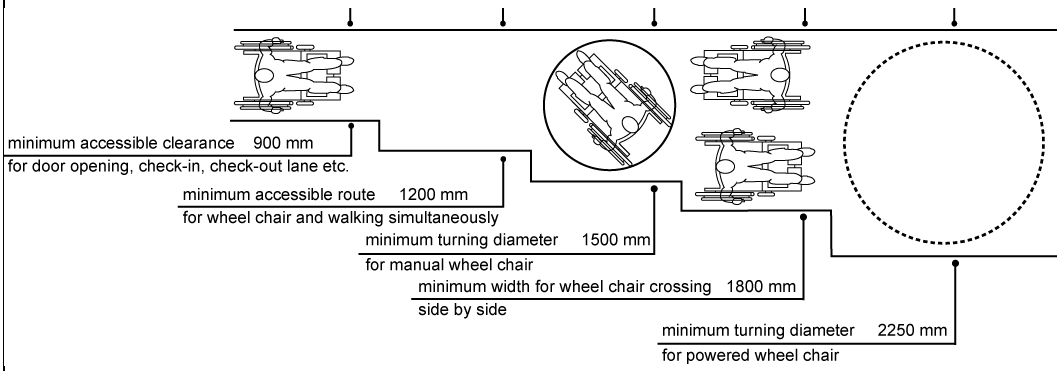


Fig: Minimum width of accessible routes

Curb Ramps

Width: 900 mm (min), Surface: slip-resistant, contrasting color and texture. Curb ramps with flared sides: not steeper than 1:10, Gradient- follow provisions of Table C.

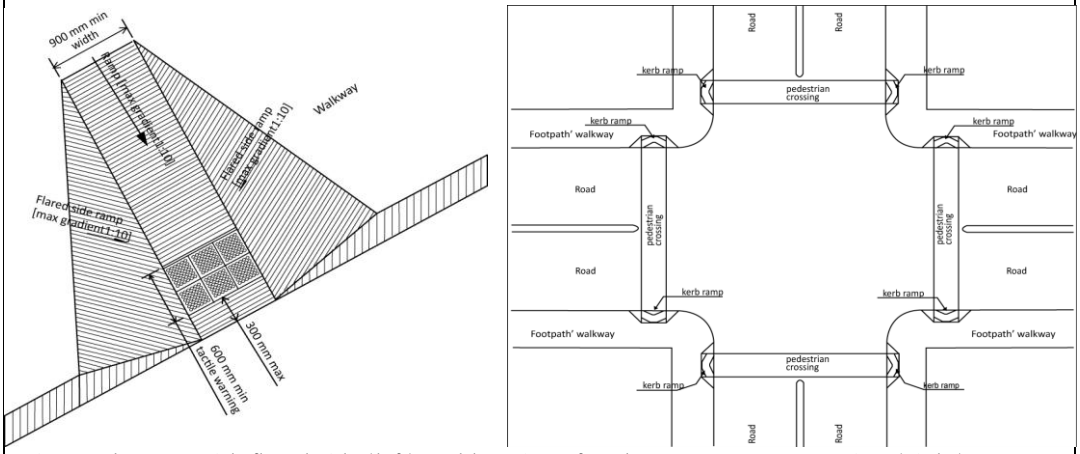


Fig: Curb ramp with flared side (left) and location of curb ramp at street crossing (right)

Pedestrian crossing: No standard found

Parking

Table C: Minimum Number of Accessible Parking Stalls

Number of vehicle park stalls	Number of accessible stalls
For first 50 stalls	1
Next 400stalls	1 additional stall per 100 parking stalls or portion thereof
Above 450 stalls	6

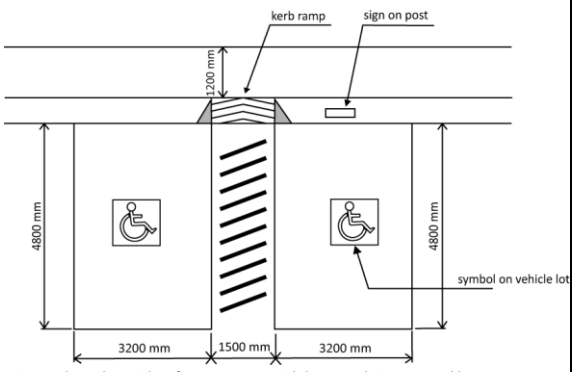


Fig: The detail of an accessible parking stall.

Dimension of accessible vehicle parking:4800 mm x 3200 mm (min).

Children's Playground: No standard found

Steps

- Uniform riser, height-150 mm (max) and tread width- 300 mm (min).
- Detectable tactile warning strips should be provided at the top, bottom and intermediate landings.

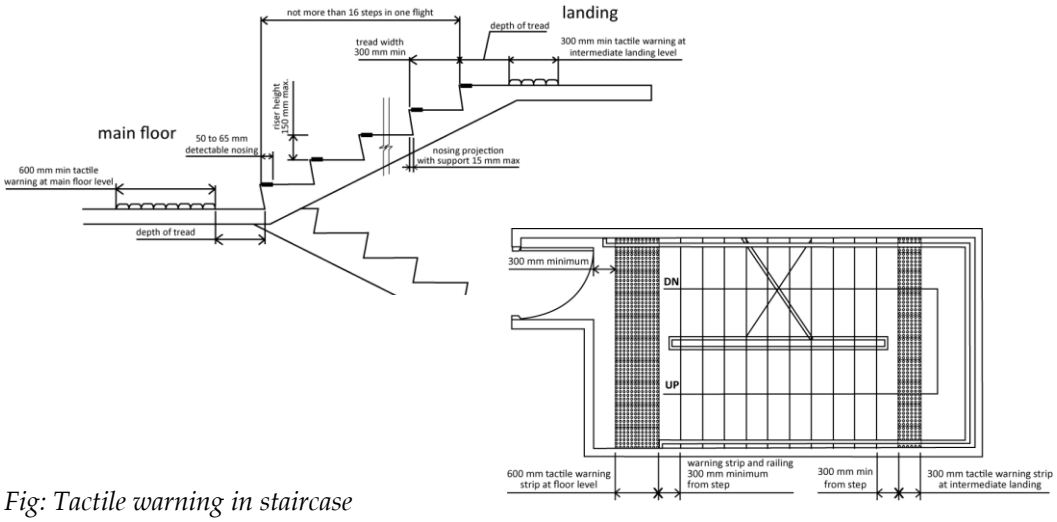


Fig: Tactile warning in staircase

Ramp

Table C: The gradient of an accessible ramp

Maximum Vertical Change of Level (mm)	Maximum Allowable Length (mm)	Maximum Slope Ratio
0 to 75	600	1 vertical to 8 horizontal
more than 75 to 150	1500	1 vertical to 10 horizontal
More than 150	9000	1 vertical to 12 horizontal

- To be used with height difference more than 150 mm within a facility, width: 1200 mm (min).

- Landing with tactile warning surface of length: 1500 mm (min), where the length of a ramp exceeds 9.0 m.

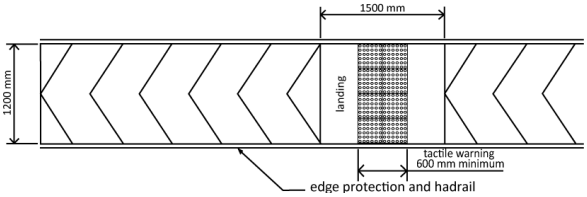


Fig: Plan of straight ramp and landing

Handrail

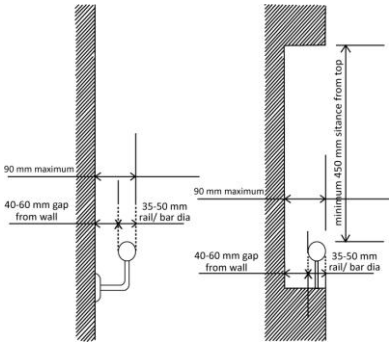


Fig: Detailed dimension of handrail

- External diameter: 35 mm - 50 mm

- Distance between handrails and its adjacent wall: 40 mm - 60 mm.

- For recess: 450 mm clearance above the top of the rail

- Vertical height: 850 mm- 950 mm from the floor or nosing (for stair).

- Continuous and extend 300 mm (min) beyond the top and bottom step.

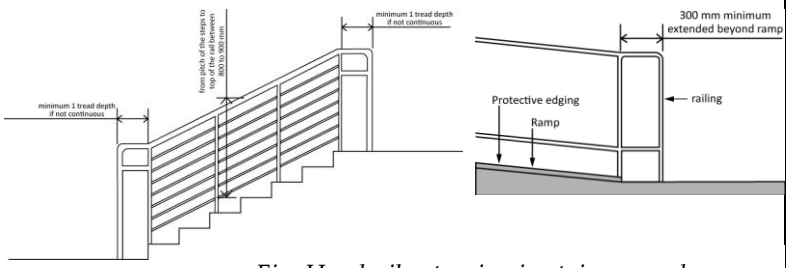


Fig: Handrail extension in stairway and ramp

Toilet

- WC compartment dimension: 1500 mm x 1750 mm (min).

- Width of approach path to WC compartment: 1200 mm (min) for a group of toilets.

Water Closet: Distance from centerline of WC to adjacent sidewall- 460 mm- 480mm. Distance of front edge of WC from rear wall- 750 mm (min). The seating top height: 450 mm- 480 mm from the floor level.

Urinals: 1 (min) wall hung type. Clear floor area- 750 mm x 1200 mm with level floor plane. Rim height- 400 mm (max) from the floor. Side privacy shield: 120 mm clearance from grab bars.

Grab Bars: 2 (min) grab bars for each toilet fixtures. Length- 600 mm (min).

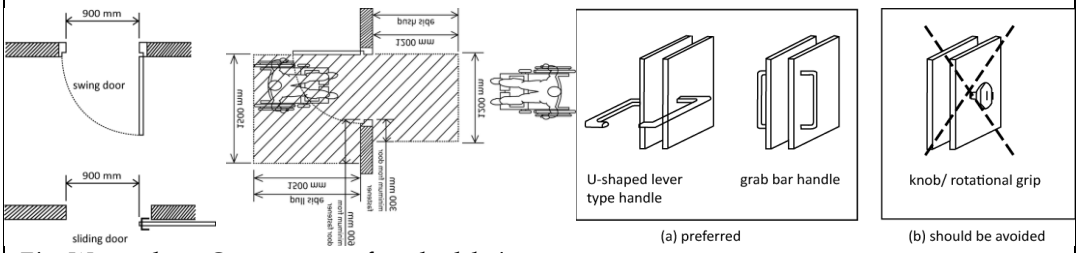


Fig: Water closet Compartment for wheelchair users

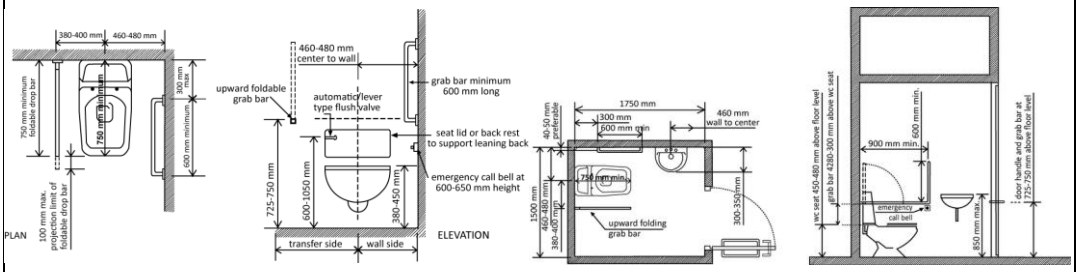


Fig: Clear width of door and unobstructed space at doorway (left) and Preference of door handles (right)

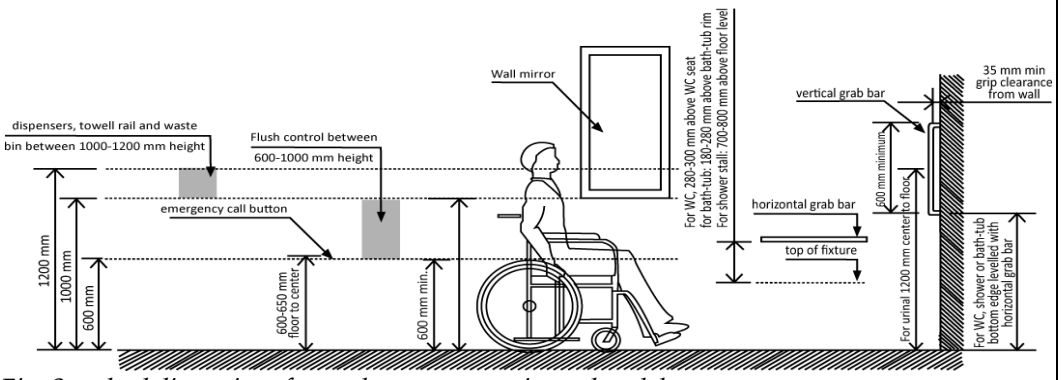


Fig: Standard dimensions for washroom accessories and grab bars

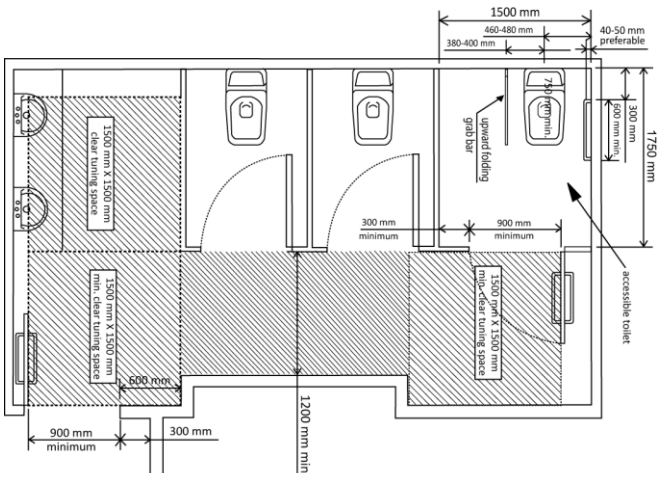


Fig: Detail of WC compartment in group toilet

Door: swing door with clear opening- 900 mm (min), same level with the floor.

Door accessories: door handles, fasteners, locks etc., height- 900 mm- 1100 mm from the floor level.

Emergency Call Bell: push-button, location height- 600 mm- 650 mm from floor level.

WC compartment in public Toilet: clear internal dimension- 1500 mm x 1750 mm (min).

Case Study Areas

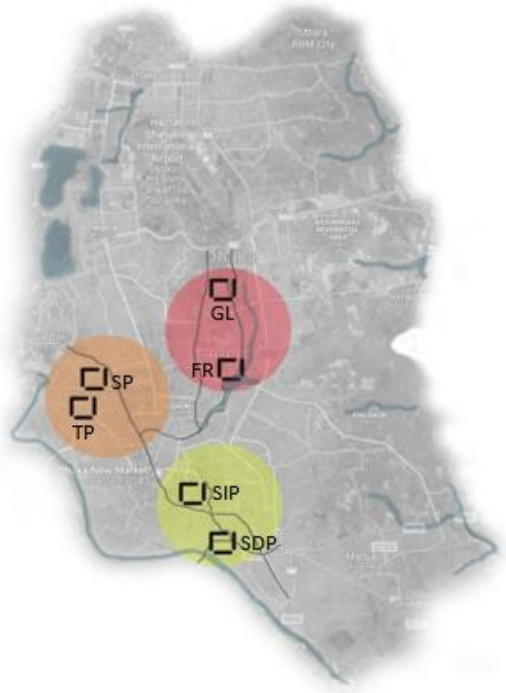


Figure-03: Selected Six Neighbourhood parks of three different parts of Dhaka

Two distinct spatial patterns are dominant in Dhaka; they are the unplanned and planned patterns (Khan Nayma & Nilufar Farida, 2009) known as Old Dhaka and New Dhaka respectively. The Old Dhaka, has an organic settlements. In the newer extensions of Dhaka, grid iron patterns are predominante.g. Dhanmondi, Mohammadpur, Gulshan, Banani, Uttara etc. The six neighbourhood parks which are located in Old Dhaka, Mohammadpur and Gulshan (Figure 03) have been selected as case studies for this paper.

Selected Neighbourhood parks of Unplanned Area (Old Dhaka) (Figure 04a and 04b)

Figure-04a: Map of SDP

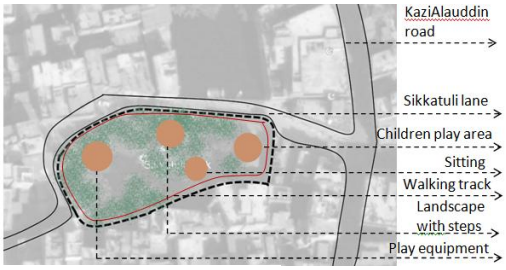


Figure-04b: Map of SIP

01. Sirajuddaula Park [SDP, 0.50 acres] -This was established in memory of Nawab Sirajuddaula, Sirajuddaula Park still looks comparatively good in the morning and crowded in the evening.
02. Sikkatuli Park [SIP, 0.290 acres] – This is a small Park of old Dhaka which serves the community as a breathing space and interaction for people of all ages.

Selected Neighbourhood parks of planned Area (Mohammadpur) (Figure 05a and 05b)

03. Tajmahal Park [TP, 1.46 acres] - The park is located on West side Block-C of Tajmahal Road. DNCC unveiled the foundation stone of the modernisation work of the park. The development plan includes planting more trees, making modern drainage system, installation of improved toilets and safe drinking water facility, walking-tracks and playground.
04. Shyamoli Park [SP, 2.0 acres] - Shyamoli park at Khilji Rd, is a piece of green in the middle of concrete buildings. The park is always overcrowded in the afternoon and evening.

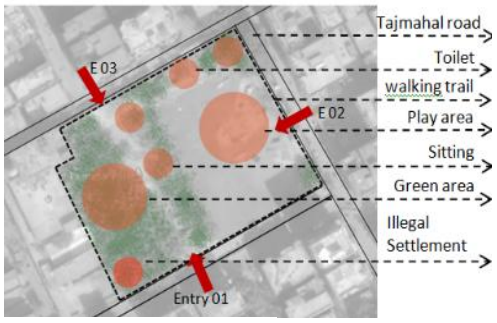


Figure-05a: Map of TP

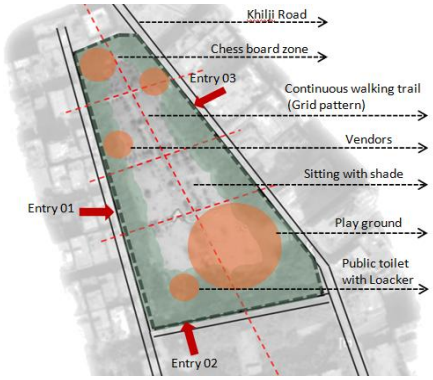


Figure-05b: Map of SP

Selected Neighbourhood parks of planned Area (Gulshan) (Figure 06a and 06b)

05. Fazle Rabbi Park [FR, 4.76 acres]-locally known as "Taltola Park", is an open area located at the southernmost edge of the Gulshan residential area. Now known as ShahidDr.Fazle Rabbi Park, this has influenced the life style and land use pattern of the neighbourhood.

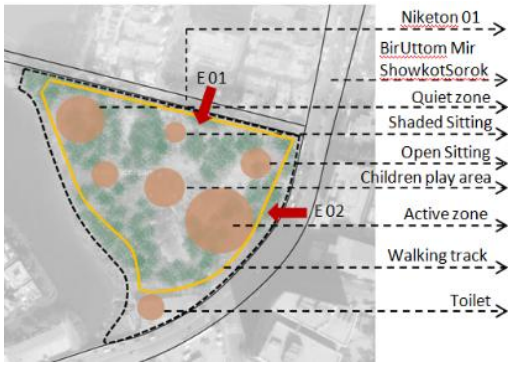


Figure-06a: Map of FR

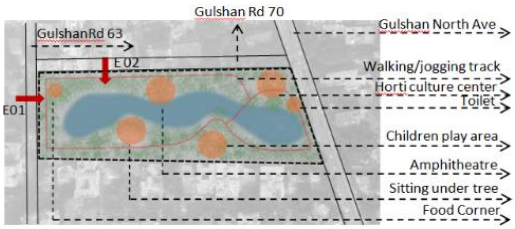


Figure-06b: Map of GL

06. Gulshan Lake Park [GL, 9.0 acres] -Nestled inside Gulshan-2 adorns a great space where children can play. The air inside the park is lighter and the temperature cooler, a sharp contrast to the heavy urban air.

Findings and Comparative Analysis

Each neighborhood parks were surveyed to find out the provision of 13 parameters and the presence of each are compared with the BNBC standards. The results are as follows:

01. Siraj-Ud-Dowla Park: The survey depicts thepresence of:

- Sensory (Tactile ground indicator, 304x304mm) - standard by the BNBC rules.
- Street furniture (not accessible for everyone)
- Pathway (width- 2460mm) - standard
- Toilet- not accessible for everyone

Figure-07a: Pathway, Obstruction, Seating of SDP

Figure-07b: Waterbody and Fountain of SDP

02. Sikkatuli Park: The survey depicts the presence of:

- Sensory (Tactile ground indicator, 304x304mm) - standard by the BNBC rules.

- Street furniture (not accessible for everyone), dustbin (not sufficient or in close proximity).

- Pathway (width- 1550-2489mm- varied) –standard

Figure-08a: Tactile indicator, Obstruction and steps at SIP

Figure-08b: Children playground, Street furniture of SIP

03.Tajmahal Park: The survey depicts the presence of:

- Ramp (Width 3556mm, 1:12) – standard.
- Street furniture (not accessible for everyone)
- Pathway (width- 1982mm but not sufficient for powered wheel chair)
- Handrail in the wooden bridge (height- 762mm) - not standard
- Toilet- not accessible for everyone.

Figure-09a: Pathway, playground and seating of TP

Figure-09b: Toilet, Wooden Bridge, boundary of TP

04. Shyamoli Park: The survey depicts the presence of:

- Street furniture (not accessible for everyone)
- Pathway (width- 2415mm) - standard
-Curb Ramps (Width- 2413mm, ratio- 1:12) - standard by the BNBC rules.
- Toilet (Grab bars- 660mm) - standard, (door distance – 685mm) - not standard.

Figure-10a: Pathway, Toilet, Curb ramp of SP

Figure-10b: Seating, Playground, Obstruction of SP

05. Fazle Rabbi Park: The survey depicts the presence of:

- Street furniture (not accessible for everyone)
- Pathway (width- 2820mm) – standard
- Signage (not sufficient and in close proximity)

- Pedestrian crossing.

Figure-11a: Pathway, Obstruction, Seating of FR

Figure-11b: Playground, Signage, Pedestrian of FR

06. Gulshan Lake Park: The survey depicts the presence of:

- Curb Ramp (Width 3251mm, 1:12) - standard by the BNBC rules.
- Street furniture (Seating-not accessible for everyone), lamp post, dustbin.
- Pathway (width- 3251 mm) - standard by the BNBC rules.
- Handrail in the bridge (height- 1041 mm) - not standard by BNBC rules.
- Signage (not sufficient and in close proximity)
- Sensory (not sufficient)
- Toilet- not accessible for everyone

Figure-12a: Pathway, Tactility, Street, Playground of GL

Figure-12b: Seating, Signage, Curb Ramp, Pedestrian Crossing of GL

It is found in all the case studies that although most of the pathways are made according to the dimension mentioned in BNBC, none of them are free from obstructions. Almost all of them lack proper signage, pedestrian crossing and parking facilities. Toilets and street furniture exist in all of the case studies but those are not universally accessible. Table-07 shows the summary of the finding and analysis at a glance.

Table-07: Comparative analysis of the case studies

Considerations	Parameters for Universal Accessibility in NP	Siraj-Ud-Dowla Park	Sikkatuli Park	Tajmahal Park	Shya-moli Park	Fazle Rabbi Park	Gulshan Lake Park
Sensory	Sensory: visual & hearing	✓✓	✓✓	X	X	X	✓
Urban Design Considerations	Obstruction	✓*	✓*	✓*	✓*	✓*	✓*
	Signage	X	X	X	X	✓	✓
	Street Furniture	✓	✓	✓	✓	✓	✓
	Pathways	✓✓	✓✓	✓	✓✓	✓✓	✓✓
	Curb Ramps	X	X	X	✓✓	X	✓✓
	Pedestrian crossing	X	X	X	X	✓	✓
	Parking	X	X	X	X	X	X

Considerations	Parameters for Universal Accessibility in NP	Siraj-Ud-Dowla Park	Sikkatuli Park	Tajmahal Park	Shya-moli Park	Fazle Rabbi Park	Gulshan Lake Park
	Children's Playground	X	✓	✓	✓	✓	✓
Architectural Design Considerations	Steps	✓	✓	✓	X	✓	✓
	Ramp	X	X	✓✓	X	X	✓
	Handrail	X	X	✓	✓✓	X	✓
	Toilet	✓	✓	✓	✓✓	✓	✓
Legend							
✓✓- Existent & Standard maintained as stated in BNBC		✓- Existent but Standard not maintained/ not accessible for everyone/ insufficient		✓*- obstruction present in the pathway and left untreated		X- Non- existent	

Recommendations

Abled people visit parks alone or with friends; differently abled people come usually with their families. Sometimes families do not feel comfortable to bring their dependent facing disabilities in public places as it still is a matter of how general public perceive them. Thus effective measures should be adopted to facilitate universal physical access. Some social interventions are:

1. Create awareness through media and news in different sectors of the society to generate public acceptance.Technical improvement has no value unless the disabled people are aware of the uses. Educationin the field of accessibilityshould be provided to acknowledge that accessibility is their right.
2. Community participation in terms of planning and design.
3. Academic involvement: Architecture schools can host seminars and lecturers to emphasize on universal accessible environment.
4. Authorities to monitor the application of minimum accessibility standards in the outdoor environment and ensure accessibility at early stage to reduce the cost.
5. Authorities should address guidelines for children's playground, pedestrian crossing and street furniture into BNBC.

Table-08: Proposed Interventions for selected neighbourhood parks of Dhaka

Short term	Long term
1. Remove obstacles from pathways. 2. Install adequate signage. 3. Maintain street furniture at proper proximity. 4. Install curb ramp with the existing pathway to allow differently abled people to the green spaces. 5. Mark pedestrian crossing. 6. Install grab bars in the toilet.	1. Incorporate tactile indicators on pathways. 2. Designate parking areas. 3.Provide sufficient and proper equipment in the children's playground. 4. Make toilets accessible. 5. Implementation of long term measures according to BNBC.

Figure-13: Suggestions for applying Universal Design in the case studies

Conclusion

The current realm of our built environment claims to be accessible but only restricted to some new buildings with ramps. The outdoor environment is mostly neglected. The implementation of the proposed recommendations in the neighborhood park would help to increase safety and comfort of all kind of users of the park, especially the disabled. Awareness and elaborate interventions on universal accessibility in the other parameters can make the whole city socially inclusive.

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