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Barrier Free Environment: An Analysis of Aligarh City, India

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Abstract

The inability of an individual to do an activity, as the so called normal do, is perceived as, 'disability'. India is the home of 1.21 billion people and 2,10,68,557 people are suffering from one or the other type of disability (Census 2011). This comprise of 2.21% of the total population. "Disability", in relation to a person, means a substantial restriction in the capacity of the person to carry on a profession, business or occupation in the State or to participate in social or cultural life in the State by reason of an enduring physical, sensory, mental health or intellectual impairment.

Disability is the consequence of an impairment that may be physical, cognitive, mental, sensory, emotional, developmental, or some combination of these. A disability may be present from birth, or occur during a person's lifetime.

Disability is an umbrella term, covering impairments, activity limitations, and participation restrictions. Disability is a complex phenomenon, reflecting an interaction between features of a person's body and features of the society in which he or she lives. It is said that, man is a social being. He/she takes birth in society, lives in society and finally dies in society. But, the social structure of a disabled person is very restricted. The suffocation or barriers that a disabled person feels seems nothing for others but is a big one for them. It is actually our infrastructural disability not an individual's disability which hampers an individual's access. This access may be physical access, access to public offices for getting information and service, provision of assistive aids and appliances and above all society's favourable attitude.

The concept of barrier free environment, as spelt out clearly in the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995, is essential to facilitate the disabled. Its objective is to integrate disabled people into society. The term 'barrier-free' indicates an environment where all users irrespective of their physical disadvantages can enter, use or access the resources as and when they want. The chapter V, VI and VIII of PWD Act 2005 and National Policy for the Disabled 2006 emphasise on barrier free environment. The present paper aims at assessing the implementation of 'Planning Barrier free Environment' and its utility and efficiency on practical grounds in Aligarh city.

Article

What is a barrier-free environment?

A barrier-free environment is a space that allows free and safe movement, function and access for all, regardless of age, sex or condition, a space or a set of services that can be accessed by all, without obstacles, with dignity and with as much independence as possible. The environment means buildings, roads, parks, gardens and other

places, service, modes of transportation, products of daily use, etc. There is a popular belief that a ramp and an elevator/lift is all that is needed to make a built space barrier-free.

It must be clearly understood that barrier-free goes far beyond just a ramp and has many other necessary aspects. These range from door and passage widths to flooring surface, from counter heights to door handles and railings, from signage and auditory signal to tactile guides. Frank Bowe (1978) in his *Handicapping America* identifies six major barriers to the integration of the disabled people in society: architectural, attitudinal, educational, occupational, legal and personal. (Thomas, 1982)

There are two aspects to the mobility of children with disabilities. The first is clearly the persons with the disability and the second is the environment in which the person moves. There no doubt that people with disabilities are handicapped as much by society and the environment as by their particular disability. Many modifications to the physical environment which need to be made will also improve access for non disabled people. The adaptations should be more than the elimination of hazards. There are major problems which need to be overcome if the environment is to be made to meet the needs of people with disabilities. One of the major problems is that many buildings were built long before the full rights of disabled people were recognized, although it can be questioned if rights of access are truly accepted even today. (Stone, 1995)

Who all face barriers?

On the face of it, it is only persons with disabilities for whom barriers become major obstacles. However, it is necessary to realize that every person, at some stage of life, face barriers. A small child, an elderly person, a pregnant lady, the temporarily disabled, all are vulnerable to barriers.

Therefore, to list out people affected by barriers are Wheelchair users, People with limited walking / movement abilities, People with visual impairment or low vision, People with hearing impairment, Elderly persons, Pregnant ladies, Children with temporary disabilities, People carrying heavy or cumbersome charge etc.

Barriers make an environment unsafe and cause a high level of difficulty to the user. But more importantly, barriers cause space to be out of reach, denying people the opportunity of participation in various spheres of life. This ranges from education, economic, social, cultural and may be other activities. This loss of opportunity is not only a loss for the person concerned but also society's loss, which misses out on their contribution. Simply put, a barrier causes exclusion and its removal is necessary for ensuring inclusion and participation of all in society.

Handicap is an evaluatory concept in which the interaction of impairment and disability with an individual's psychological make-up, the resources available, and social attitudes affects adversely the performance of ordinary roles. (Stone, 1995)

Today accessibility for all is recognized as a basic necessity and there are attempts all over the world to ensure this. Barrier-free features are now becoming fundamental to all design concepts. These help: **to reach:** ramps, **to enter:** entrances, **to move around:** corridors, elevators, stairs and signage, **to use:** doors, toilets, operating mechanisms and fixed features.

The main objectives of the "Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1996 enacted by the Government of India on January 1, 1996 are to create barrier free environment for persons with disabilities and to make special provisions for the integration of persons with

disabilities into the social mainstream. As spelt out clearly in the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1996, a barrier free built environment is essential to facilitate the disabled. Chapter VII of the Act, Sections 44 to 46 deal with non-discrimination in transport on the roads and in the built environment. It enjoins upon the governments and local authorities to ensure within their economic capacity provision for installation of auditory signals at red lights in the public roads for the benefit of persons with visual handicaps, curbs and slopes to be made in pavements for the easy access of wheel chair users, devising appropriate symbols of disability and warning signals at appropriate places.

In regard to non-discrimination in the built environment, provisions have been made in this Act for ramps in public buildings, adaptation of toilets for wheel chair users, Braille symbols and auditory signals in elevators.

In order to create a barrier free environment in consonance with the provisions of the Act, the Government of India (Ministry of Urban Affairs & Employment) is currently engaged in the process of amending/modifying the existing building bye-laws which would be applicable to all buildings and facilities used by the public.

With this intention to ensure that everyone, including the physically disabled and elderly persons, will have equal access in everyday life in the city, the Min. of UA&E has constituted a committee under the chairmanship of DG (W), CPWD with the following members for the purpose of developing comprehensive Guide lines and space Standards for barrier free built environment for disabled and elderly persons. (CPWD, 1998)

The Act's main specification was intended to make buildings and facilities accessible to and usable by people with such physical disabilities as the inability to walk, difficulty in walking, reliance on walking aids, blindness and visual impairments, speech and hearing impairments, in-coordination, reaching and manipulation disabilities, lack of stamina, difficulty in interpretation and reacting to sensory information, and extremes in physical size.

These dimensions can be used for guidance when designing facilities to be used by persons with disabilities.

This paper is mainly concerned with access to, movement within and around, buildings, by people with disabilities, particularly through ramp. The paper mainly deals with the actual implementation for creating barrier free environment through building ramps with hand rails for easy access to buildings.

Obstacles that make it difficult or impossible for people with disabilities to enter or leave public areas, public buildings and private residences are often causes of social isolation. Over the past 15 years, social policies have attempted to minimize these obstacles.

Ramps are an important feature in accessing a home or agricultural building. This applies not only to people who use wheelchairs but also to those who have difficulty in climbing stairs, such as people who have arthritis or are hemiplegic and those who use walkers, crutches or canes. To be safe and most effective, ramps should be built with a few basic guidelines in mind.

Slope: Slope is the term used to describe how steep a ramp is. The slope is extremely important because it affects how difficult it is to travel up and down the ramp. **If the slope is too steep, the ramp may be too difficult for someone to use or may even be unsafe.**

A ramp's slope - the angle of the inclined surfaces - is perhaps a project's most critical consideration, because of its impact on layout requirements, the expense involved, and the ramp's ultimate usefulness. Slope is the right-angle relationship of vertical height (rise) to horizontal length or projection (run). It is usually expressed as a ratio of these two measurements, with the rise figure frequently set at a unit of one. For example, a slope of 1:12

means that as each dimension unit of height changes, the other right-angle side projects out 12 units, which together result in a certain angle for the inclined, third side of the triangle.

It's important to point out that the larger the run figure in a slope ratio, the **gentler** the angle for the inclined surface will be - a 1:16 slope, for example, is **not** as steep as a 1:12 slope. This fact is a source of initial confusion for many people, who conceptualize that a bigger number must mean a steeper slope.

A variety of standards exist for the slope of wheelchair access ramps. The most frequently suggested standard for both personal and universal accessibility is a slope of 1 in 12 that is, a ramp that rises one unit for every 12 units in length.

Comparison of 1:12 and 1:20 slopes

A gentler slope has less resistance for either walking or wheeling. The 1 to 12 slope should be seen as the steepest slope to be built and may be too steep for some people.

Width: The width of the ramp should be at least 36 inches.

Safety advisory:

There may be a temptation to build a ramp that is steeper than the recommended 1 to 12 minimums in order to conserve space or reduce costs. Before deciding to build such a ramp, remember that the steeper the ramp is, the more dangerous it becomes to anyone using it. Ramp Project personnel have replaced steep ramps that have caused falls resulting in serious injuries and ramps that were so steep that the person needing it could not use it independently.

Getting a Ramp Built: With information and materials available from most local building supply stores, an individual with ordinary carpentry skills can fabricate his or her own ramp. This is clearly demonstrated by the millions of homemade decks that have been constructed over the past few years. If a person lacks the basic carpentry skills, a local carpenter or contractor should have little trouble constructing a ramp. **However, don't assume the builder you choose will have knowledge of the guidelines for ramps included in this publication.** If the builder is unfamiliar with ramps for use by people with disabilities, a copy of this publication or similar information regarding guidelines for ramp construction should be provided to the builder to avoid an unsafe or unusable structure. **Remember who the user will be-it won't be the builder.**

In this paper we are concerned mainly with curb ramps and slope ramps. And the handrails along the ramps for support. Anthropometrics is an important factor needed for creating barrier free environment and hence is inevitable for building ramps also.

Curb Ramp

Curb ramps are provided where the vertical rise is less than 150 mm. It should have a slip-resistant surface. It should be designed not to allow water accumulating on the walking surface. It does not require handrails. It should not project into the road surface. It should be located or protected to prevent obstruction by parked vehicles, and should be free from any obstruction such as signposts, traffic lights, etc.

Gradient

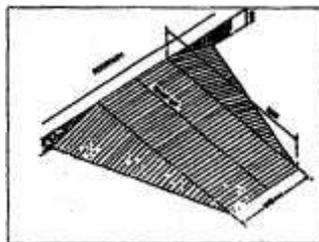
The gradient of a curb ramp should not be steeper than 1:10.

Width

The width should not be less than 900 mm.

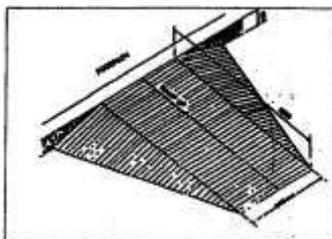
Flared Sides

The Curb ramps should have flared sides where pedestrians are likely to walk across them as shown in the figure and the gradient of the flared side should not be steeper than 1:10.



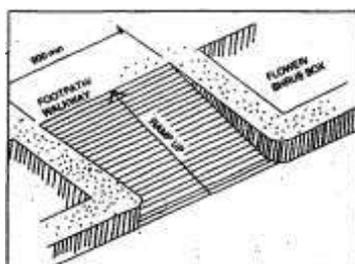
Built-up/Extended Curbs

These should not be used if they project into a roadway, as it is dangerous for users and obstructive for vehicles.



Returned/Continuous Curb

Curb ramps with returned/ continuous curb are an alternative approach that may be used where pedestrians will not be expected to walk across the ramp.



Warning blocks

Warning blocks should be installed at the end of the curb ramp to aid people with visual impairments. Where the vertical rise is greater than 150 mm, it should constitute a slope ramp.

Slope Ramp

General

The Ramps allow persons in wheelchair to move from one level to another. However, many ambulant persons with disabilities negotiate steps more easily and safely. Hence it is preferable to provide accessibility by both steps and ramps. Where the horizontal run of the approach ramp exceeds 9000 mm in length, an alternative stepped approach, in addition to the ramp approach, should be provided for people with ambulatory disabilities. Where there is a large change in elevation that requires multiple ramps and landing combination, other solutions such as elevators should be considered.

Gradient

Gradient of a ramp should not be steeper than 1:12 and be constant between landings.

Width

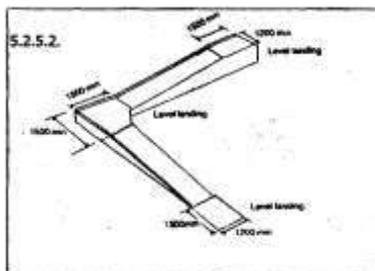
The minimum clear width of a ramp should be 1200 mm.

Surface

Ramps and landing surfaces should be slip resistant as described and outdoor ramps and their surfaces should be designed to prevent water from accumulating on the walking surfaces.

Landings

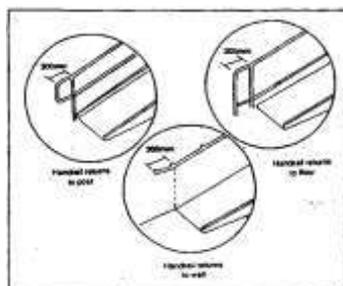
Ramps should have a level landing at the top and bottom of each run and also where the run changes direction as shown in the figure.



Landings should be provided at regular intervals of not more than 9000 mm of every horizontal run as shown in the figure. And have a level platform of not less than 1500 mm.

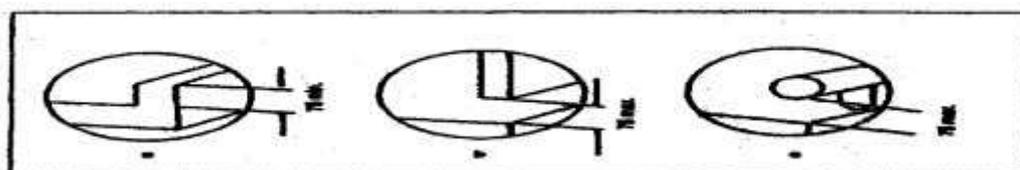
Handrails

A ramp run with a vertical rise greater than 150 mm should have handrails that are on both the sides and are placed at a height of between 800 mm and 900 mm above the floor level. Handrail extensions as shown in the figure should extend horizontally for a distance of not less than 300 mm beyond the top and bottom of the ramp. To provide support for persons who may need help to negotiate the ramp, and Not project into another path of travel.



Edge Protection

Ramps and landings not adjacent to a wall should have an edge protection such as a curb with a minimum height of 75 mm as shown in the figure. A raised barrier with its lower edge not more than 75 mm from the ramp or landing surface as shown in the figure or a rail with the bottom edge not more than 75 mm from the ramp or landing surface as shown in the figure.



Aligarh city: An overview

Aligarh is situated in the western part of Uttar Pradesh and is a very important education and commercial hub of India. According to the 2011 census Aligarh district has a population of 3,673,849. The district has a population density of 1,007 inhabitants per square kilometre (2,610 /sq mi). Its population growth rate over the decade 2001-2011 was 22.78%. Aligarh has a sex ratio of 876 females for every 1000 males, and a literacy rate of 69.61%.

Aligarh is an important commercial as well as educational hub of India. Situated in Western Uttar Pradesh, Aligarh has always remained a centre for various movements that have re-shaped India.

The city has now developed itself as an important business centre of Uttar Pradesh. The city is famous for its lock industry. The locks produced in Aligarh are exported all over the world. The city is an important centre for Brass Hardware and sculptures as well. A visit to Aligarh is a must for both casual visitors as well as researchers who want to trace origin of Nationalist movement in India.

This is an empirical study based on observation and survey. In our survey to the different government offices, public places and educational institutions we found that the ramps were built just to overcome the burden of the act being passed. They are not fulfilling the minimum required measurements. The pictures in slides make the picture more clear.

Ramps are either too short. Or if the length is appropriate then the width is narrow. Some ramps are without railings, which are not safe for the use. There is no level landing, guardrail, or wheel stop, and the lip at the bottom is not flush to the ground. Despite a provision in the Disable's Act and its mention in the building norms, the law is not enforced aggressively in the city," Whenever a new structure is erected in the city, one section of people who invariably get left out is the disabled and other 'people with limited mobility'.

Suggestions

The following points must be kept in consideration while constructing a ramp.

- Who's the primary user?
- What type of assistive device does the person use (cane, crutches, walker, manual or electric wheelchair, motorized 3-wheel cart)?
- Will the person's abilities change? Plan for anticipated changes.
- Will the person use the ramp independently or will help be needed?
- Who will provide help and what are that person's abilities?
- Which entryway is best for the ramp? Consider the inside as well as outside. Narrow doors or hallways can prevent access to a doorway from the inside.
- Placement of existing door handles and swings direction of doors.
- Where does the person want to go most often (garage, driveway, front sidewalk)? Where is the best place to access transportation?
- If there is an attached garage, can a ramp be placed inside?
- How will the ramp affect available yard space?
- Are there barriers such as trees, shrubs, poles, etc.?
- How will the ramp appear?
- What are the local zoning requirements for lot lines and setbacks?

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