



## **Ipshita Sankat**

***Ipshita Sankat is B. Arch. First Year Student at School of Planning and Architecture, Bhopal. She is a design and architecture learning enthusiast and aspires to understand the connection of the "User" and the "Built Environment". She is always observant towards the activities and functions happening in the built environment and the people's behavior in the built environment. She aspires to learn "Behavior Observation Research Tools" and keen to incorporate them in design to learn the behavior of people in built environment***

***She is author of five story books written as the bedtime stories for the age group of 3 to 6 years children and published on Amazon KDP.***



## **Dr. Sandeep Sankat**

***Dr. Sandeep Sankat Associate Professor, School of Planning and Architecture, Bhopal (PhD, M. Ekistics, B.Arch.) Dr. Sandeep Sankat is an Associate Professor and Head Department of Architecture, School of Planning and Architecture, Bhopal (M.P.) India. Before this, he was a senior lecturer in F/O Architecture and Ekistics, Jamia Millia Islamia, New Delhi. Beginning his career in the mid-nineties he practiced as an Architect having his own office "Design Innovations" in Indore, Madhya Pradesh, India.***

***His specializations are in Architecture, Ekistics, Human Centric Design, Universal Design, Inclusive Design, Enabling Environments and Elderly and Built-Environment. He did his PhD in the area of Elderly and Built-Environment on the topic "Creating Inclusive Living Environments in Urban Residences for Indian Elderly", from the School of Planning and Architecture, Bhopal, Masters in Ekistics from Faculty of Architecture and Ekistics, Jamia Millia Islamia, New Delhi and Bachelors of Architecture from Madhav Institute of Technology and Science, Gwalior, (M.P.).***

***For his proposal for the concerns towards the success of "Sugamya Bharat Abhiyaan" through Universal Design Education, he received Erasmus + Global mobility funding in 2016 and is an Erasmus Fellow. He has been awarded the prestigious National "NCPEDP MPHASIS Award 2016" for his work in accessibility and disability studies and***

***Universal Design. Recently he has been awarded with the national "Design Educators Award 2023" for teaching Universal Design. He has been awarded at various platforms for his concerns and work in the area of Universal Design and Accessibility. He has published research papers in journals and conference proceedings focused on accessibility and disability studies. He has secured first position and distinction in the Bachelors and Masters Courses. He has been a recipient of Gold Medal for the Masters Course of Ekistics from F/O of Architecture and Ekistics, Jamia Millia Islamia, New Delhi. Awarded, for the design of accessible toilet (designed following Universal Design Principles) in the category "The Urban Individual Toilet" in the San- Sadhan Hackathon organized by the Department of Empowerment of Persons with Disabilities (Divyangjan) and Ministry of Jal Shakti in association with Atal Innovation Mission, Niti Aayog, Bill & Melinda Gates Foundation.***

***He has also represented SPA, Bhopal on various administrative posts, including, Dean Academics, Dean Student Affairs, Controller of Examinations etc. And at present he is Head of the Department at the Department of Architecture, School of Planning and Architecture Bhopal.***



## **Vishakha Verma**

***Assistant Professor***

***School of Planning and Architecture, Bhopal***

***Vishakha Verma is an Assistant Professor in the Department of Architecture at the School of Planning and Architecture, Bhopal, MP. She began her career with hands-on experience in architectural and landscape projects across pan India including her hometown, Dewas, Madhya Pradesh, before moving into academia. She previously held a faculty position at the National Institute of Technology, Hamirpur, Himachal Pradesh, for two years.***

***She holds a Master of Architecture with a specialization in sustainable architecture. Her Post graduation thesis was titled as Restorative Environment and Well Being in a Hospital through Landscape Design- A case of M.Y Hospital, Indore MP. Vishakha's research interests include User Centric Design, Built Environment and Human Behavior, Biophilic Architecture, Architecture and Well-Being, Climate Responsive Architecture, Inclusive Environment, Neuroarchitecture, Healing Architecture, aiming to enhance user experience and create healthier, more livable environments. She is equipped with materials like mud and bamboo and strives to explore such more sustainable materials.***

***She supports the idea that the resources we have are not inherited from our forefathers but borrowed from future generations. Therefore, it is our responsibility to use them wisely and, as a designer, to create built environments that foster inclusion for diverse user groups.***

# **Accessible External Built Environment: A case of Pimpri Chinchwad, Sangvi, Pune.**

*Ipshita Sankat ,B. Arch. First Year,*

*Dr. Sandeep Sankat ,*

*Ar. Vishakha Verma Assistant Professor*

*School of Planning and Architecture, Bhopal*

## **Abstract:**

**The built environment should be designed for the provision of comfort to all the users of the built environment. Whether it is the external built environment or internal built environment, it should be designed in such a way that they should be comfortable and accessible to all.**

**An attempt to provide accessibility in the external built environment to the vision impaired has been observed at the footpaths of Navi Sangvi, Pune. At the first instance it looks an excellent effort, rather an additional effort by the municipal corporation to show concerns for the persons with disabilities and to create accessibility provisions for the persons of vision impairment by providing tactile tile on the newly constructed footpaths. The two types of tiles, which are the standard provision to provide direction and warning to the persons with vision impairment.**

**This study is an ocular and observational study to check and understand how effective are the provisions for accessibility, how effectively it has been constructed and whether provisions are**

**practically functional and working for the persons with vision impairment?**

**A methodological approach has been adopted for the study to first do the observations on site and click photographs for photo analysis, and then a survey with simulation methods to understand the appropriateness and effectiveness of the provisions for accessibility.**

**Keywords: *Universal Design, Tactile tiles, Persons with Vision Impairment.***

### **Introduction:**

**Architecture is done by the architects for the people i.e. the buildings are made for the people. When it is made for the people then understanding those people who occupy or are going to live in those buildings is essential because it is for those whom the designers or the architects are designing. In the city, with the huge populations in the Indian cities the people utilizing the external built environment needs to be provided with adequate and appropriate built environment for their comfort and ease of use.**

**These people In the Indian scenario are diverse, ranging from male, female, transgender who can be of different age groups may be children, youngsters and elderly. They may be of different region, religion, cast etc. and might be the "Persons with Disabilities" too which as per the Person's with Disability Act 2016 are 21 Disabilities. All these people, the diverse population uses the external built environment of the cities, and they should be comfortably accommodated by the designers and the architects of the built environment**

## **Background:**

**India is signatory of the UNCRPD, The Convention was adopted by UN General Assembly on December 13, 2006 and opened for signing by the State Parties on March 30, 2007. Adoption of the Convention has really imparted empowerment to Persons with Disabilities across the globe to demand their rights and make State, private and civil society agencies accountable for enjoying their rights. (Department of Empowerment of Persons with Disabilities, n.d.)**

- **India is one of the few first countries which ratified the Convention. Consequent upon signing the Convention on March 30, 2007, India ratified the Convention on 01.10.2007. The Convention has come into force from May 3, 2008. The convention emphasizes on provision of accessible built environments to the diverse population of India.**

## **Aim:**

**To study and understand the accessibility provision attempted at the footpaths of Pimpri Chinchwad, Pune, to provide warning and directions to the persons with vision impairment.**

## **Objectives:**

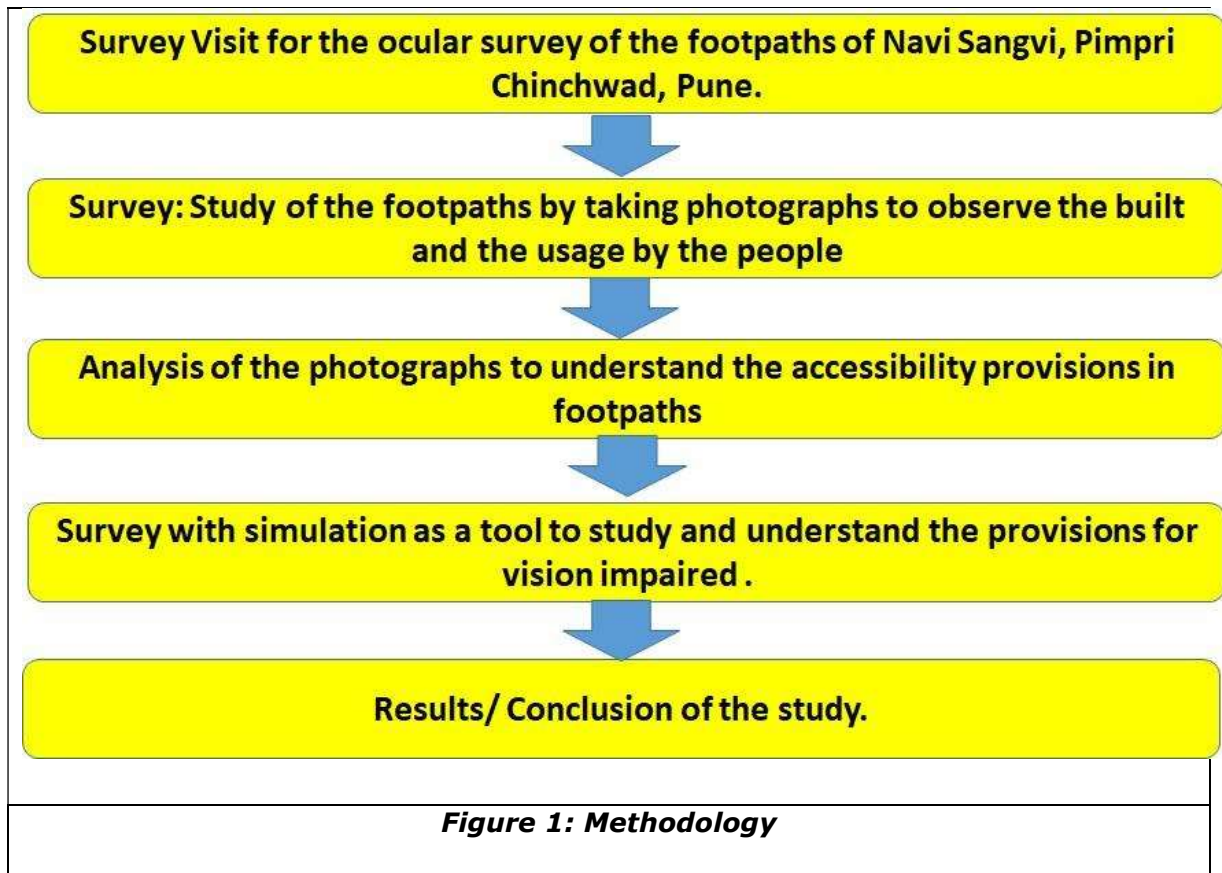
- **To do an ocular survey of the provisions done by the municipal corporation for the provision of inclusion at footpaths of Navi Sangvi, Pimpri Chinchwad, Pune.**
- **To analyse and understand the footpaths for the measures undertaken for the provision of accessible built environment.**
- **To synthesize in the form of conclusions and results of the ocular survey.**



## Methodology

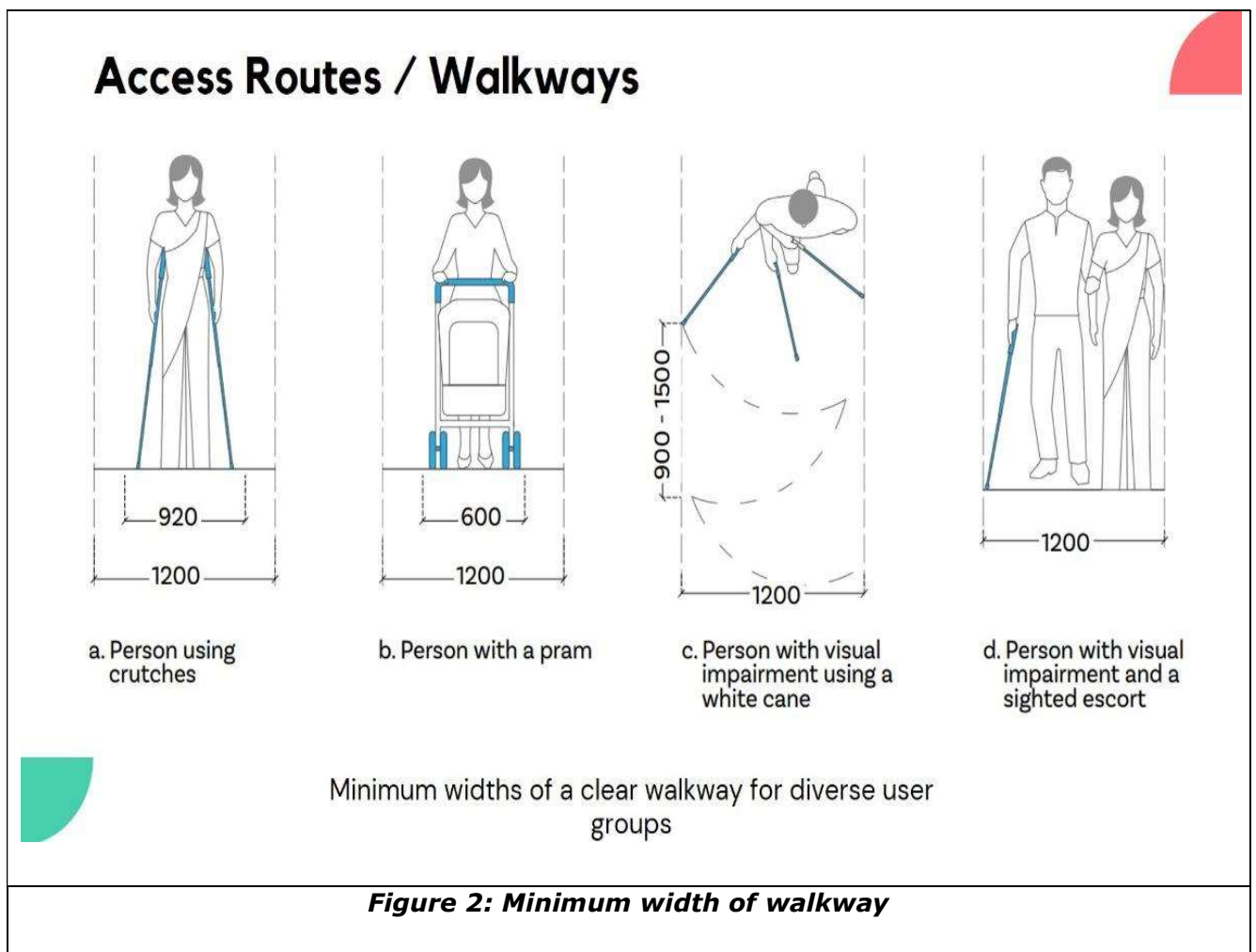
It has been observed that an effort has been done by the municipal corporation while the new roads were constructed at Navi Sangvi, Pimpri Chinchwad, Pune. The municipal corporation has provided tactile tiles on the footpaths to provide accessible footpaths. There are standard two types of tiles which have been provided on the footpath. These are yellow in colour to provide ease of visibility and the tiles have an embossed strips which facilitates direction to the vision impaired and the round / circular embossed ones are the warning tiles which denotes that there is an obstruction, level difference or a danger is there.

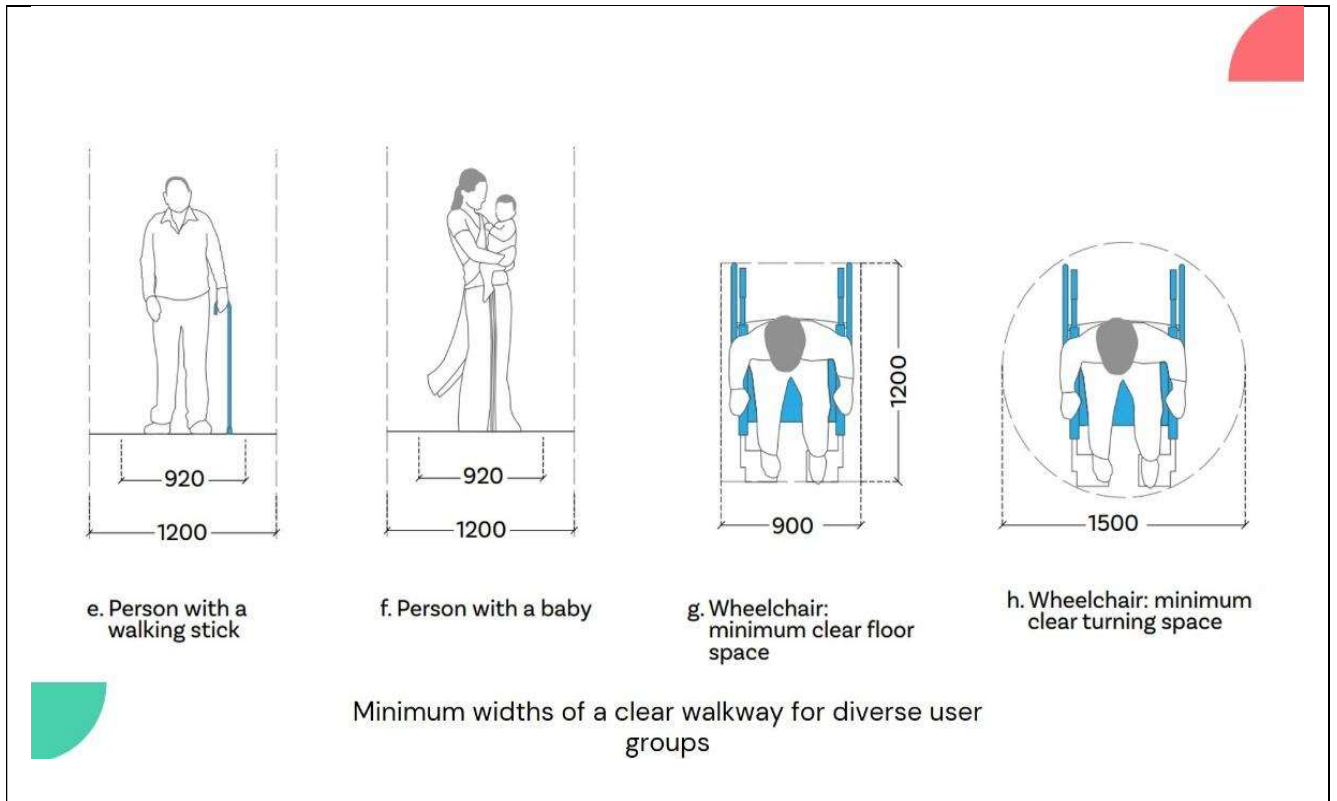
The methodology adopted is a stepwise process as mentioned in the methodology diagram;



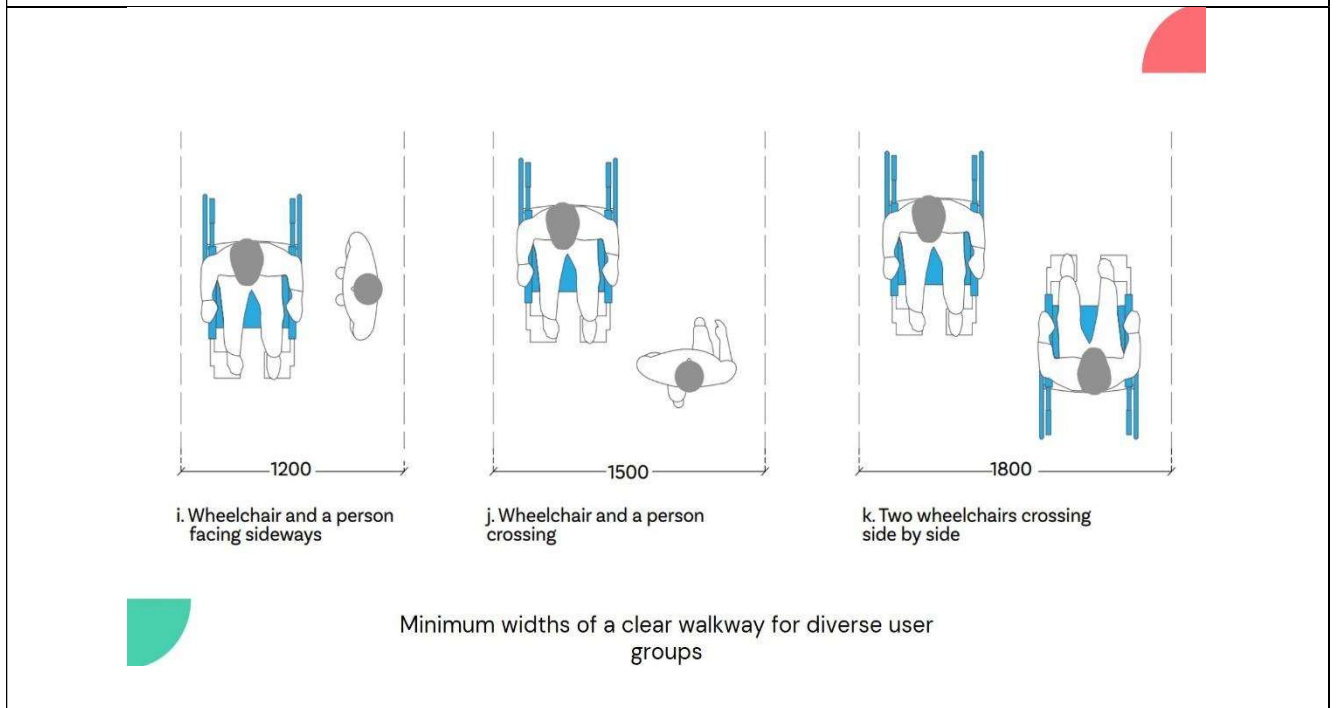
**Step 1: To conduct an ocular survey by visiting the footpaths of the Navi Sangvi, Pimpri Chinchwad, Pune. The footpaths has been visited and the photographs has been used as a tool for ocular survey.**

**The accessibility standards has been referred from harmonised guidelines for better understanding of the provisions for accessibility in the esternal built environment focussed to the provisions on footpaths and walkways. Following are the provisions as per the standards;**

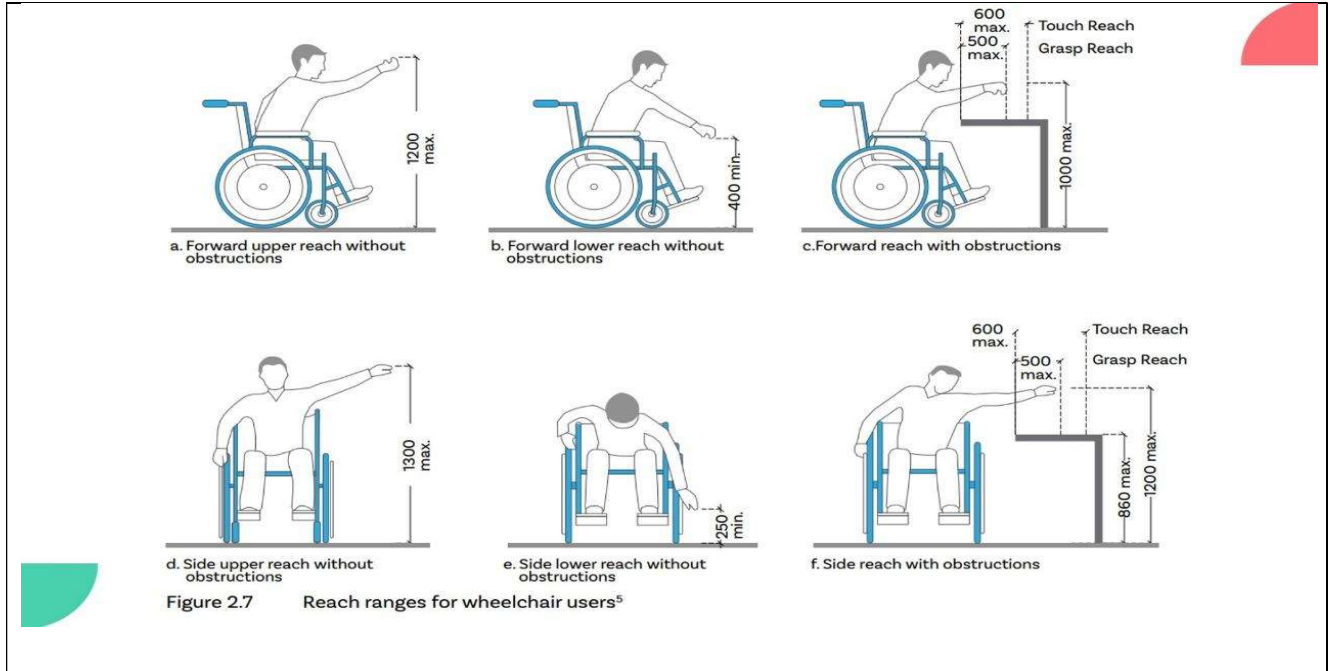




**Figure 3: Minimum width of walkway**



**Figure 4: Minimum width of walkway**



**Figure 5: Minimum width of walkway**

**Source: Harmonised guidelines 2021 (NIUA, 2024)**

## The Tactile Ground Surface Indicators

These are provided on surface to guide the vision impaired to identify the right direction and a warning whenever a hazard is upfront.

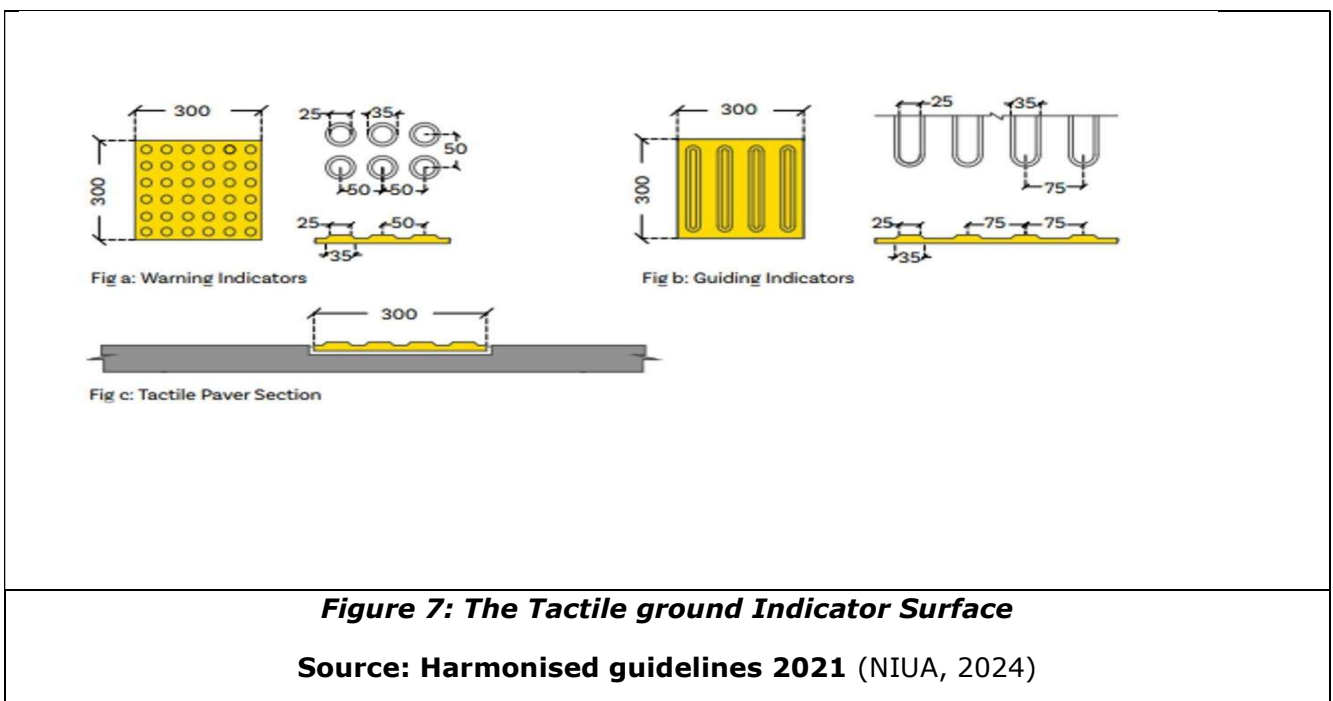


**Directional treatment may be required to assist with:**

- **Direction, that is, to indicate a clear continuous accessible path of travel; and**
- **Location, that is, to provide assistance to locate a target such as a pedestrian crossing, entrance to a public building, ticketing machine or phone booth.**

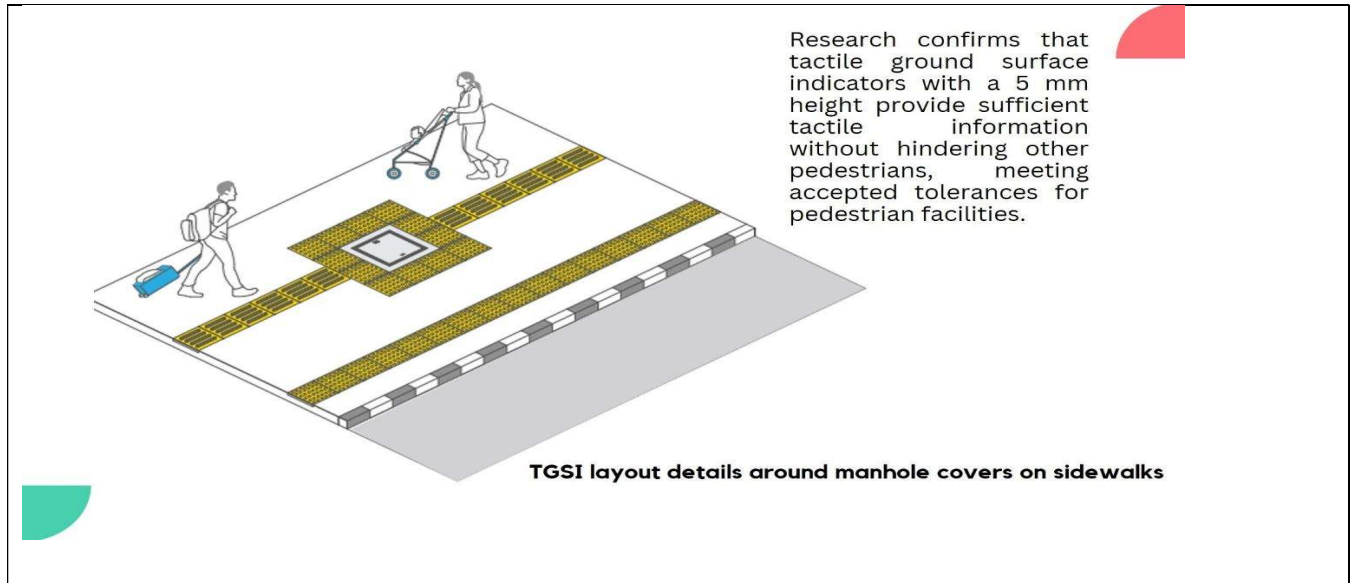
**Warning treatment may be required at:**

- **Hazardous locations, such as steps, stairs, railway platforms, pedestrian crossings, waterfront edges, etc.**
- **Destinations to provide information about the location of amenities such as ticketing machines, service counters, phone booths, etc.**



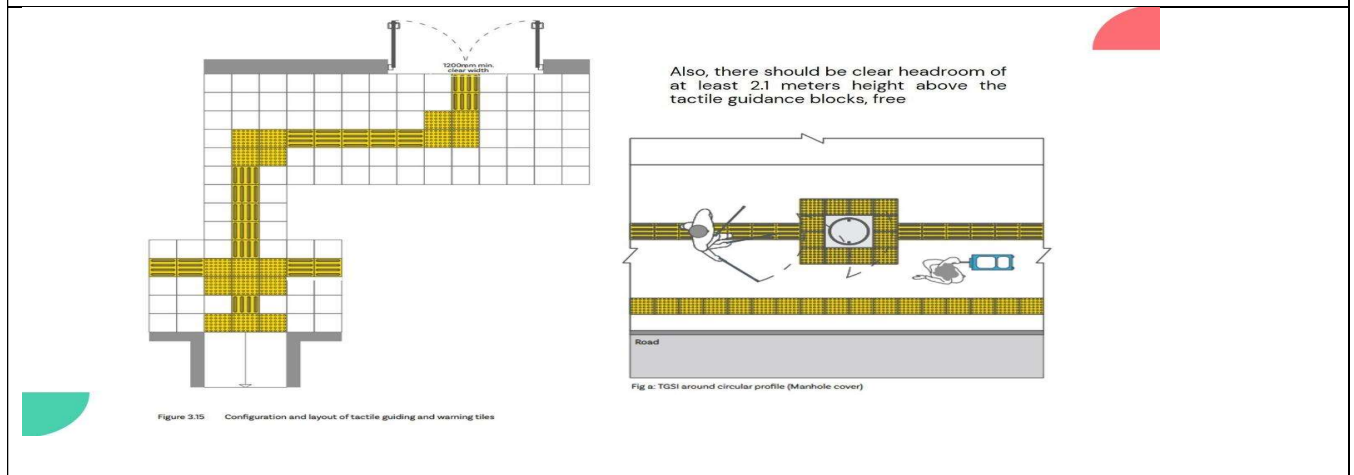
**The Application of Tactile Ground Surface Indicators:**

The tactile ground surface indicator are provided to give the directions and warning. Thus, they need to be provided sensibly and continuous as specified in the standards;



**Figure 8: The Tactile Ground Surface Indicator**

**Source: Harmonized guidelines 2021(NIUA, 2024)**



**Figure 9: The Tactile Ground Surface Indicator**

**Source: Harmonized guidelines 2021(NIUA, 2024)**

## Standards for Ramps

Ramps are the integral element in provision of accessibility but needs a careful design and applications for its effective usage especially by

**the mobility impaired wheelchair user. Thus appropriate gradient for the slope of the ramp is an essential requirement.**

## External Ramps

Table 3.4 Gradient and Length of Ramps

GRADIENT OF RAMP	1:12	1:14	1:15	1:20	NOT GENTLER THAN 1:25
Maximum length of horizontal run-in metres	6	9	11	15	18

- The number of horizontal runs of ramp should be limited to 4, i.e. with 3 intermediate landings.
- Ramp gradients should prioritize slopes that enable independent wheelchair movement, aligning with the Universal Design principle of Low Physical Effort.
- Outdoor ramps and their surface should be designed to prevent water from accumulating on the walking surfaces.
- Landings should be provided at the top and bottom of each ramp run, at direction changes, and at intervals of no more than 9000 mm along every horizontal run.

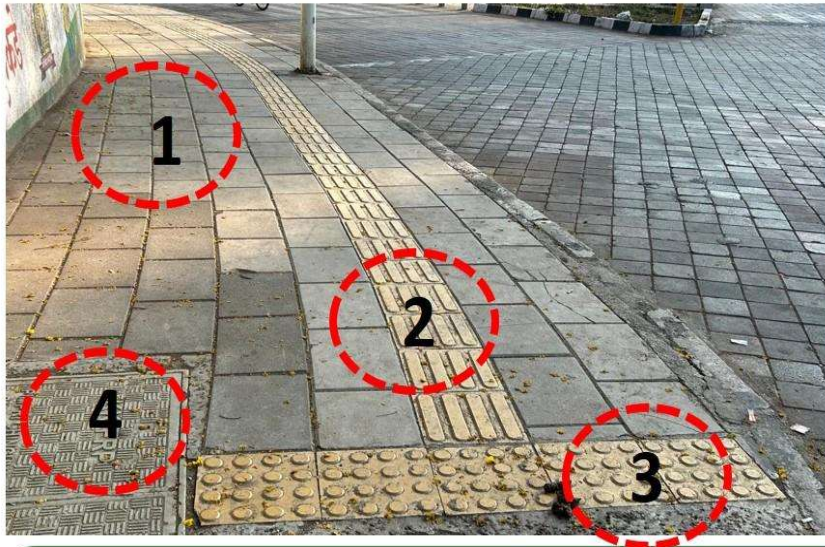
**Figure 9: The External Ramps**

**Source: Harmonized guidelines 2021 (NIUA, 2024)**

**Step 2: While walking on the footpath photographs has been taken at various points. For observations and analysis these photographs has been used as a tool where each photograph has been analysed for provisions on site, observations and analysis to take out the inferences.**

## The Ocular Survey

To study and understand the provisions on footpaths of Navi Sangvi, Pimpri Chinchwad, Pune.



### Observations:

1. The footpath, paved with concrete tiles.
2. Tactile direction tiles.
3. Tactile warning tiles.
4. An inspection chamber of sewer line.

### Inferences:

1. An appreciable effort by the municipal corporation to provide footpath for public usage.
2. Additionally they have taken care to provide accessibility to the persons with vision impairment. The tiles are direction tiles to facilitate directions to the vision impaired .
3. The warning tiles with round studs to give warning of any danger of level difference or a hazard ahead.
4. The sewer line in going along with the footpath which has inspection chambers and manholes at regular intervals.

**Figure 10: Observations and inferences**



### Observations:

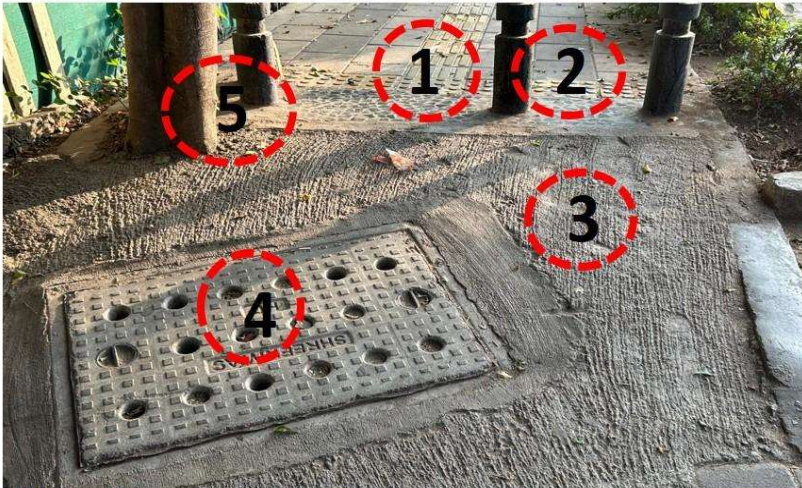
1. The footpath discontinued wherever passage across required.
2. Bollards provided to stop two wheelers using the footpath.
3. Inspection chamber
4. Gas pipeline indicator.
5. The crazy work, surface created with broken tile pieces.
6. Round stud warning tiles.
7. Ramps created for level difference.

### Inferences:

1. Whenever an in between passage required suddenly the footpath vanishes, the tactile guiding indicator surfaces vanishes and the direction for vision impaired is lost
2. Bollards provided to stop the bikers using the footpath for parking and running bikes when traffic jams occur, but what about the wheel chair user? A wheelchair user will not be able to use the footpath as the gap between bollards is not sufficient.
3. The inspection chamber coming in between the footpath with a totally different surface texture.
4. The gas pipeline indicator protrude out creating and obstacle for all.
5. The tactile guiding indicator surface vanishes and a very different texture has been provided wherever the bollards are placed.
6. The warning tiles gives the message of hazards ahead in he form of bollards and the level difference and the vision impaired is clueless .
7. Ramps has been created to meet out the level differences but of rough concrete surface and at time with the position of inspection chamber too.

**Figure 11: Observations and inferences**





**Observations:**

1. The tactile guiding indicator surfaces provided to warn the persons with vision impairment.
2. Bollards provided to stop two wheelers using the footpath.
3. The Ramps provided to meet out the level difference.
4. Inspection Chamber.
5. Electricity Pole.

**Inferences:**

1. The flow of the movement of the Person with Vision impairment is abruptly ended with no further clue and the bollards are creating problems being an in between obstruction too.
2. The bollards might be stopping the two wheelers but they are restricting the movement of a person with mobility impairment at places the width between the bollards is approximately equal to 815 but usually they are provided even less than 750 in width.
3. The ramps provided are the ramps with improper gradient it is rather a concrete ramp which has been made rough. With the improper gradients it is difficult to maneuver wheelchair.
4. The sewer lines and design of footpath are no coordinated thus the inspection chamber is lying on the ramp. The surface of ramp and the lid of inspection chamber is not conducive to wheelchair movement.

**Figure 12: Observations and inferences**



**Observations:**

1. Group of Bollards provided all around the inspection chamber.
2. The Inspection chamber
3. The raised pathway

**Inferences:**

1. The group of bollards are encircling the inspection chamber which is creating an obstruction not only for wheelchair user, vision impaired but also to the people moving on pathway.
2. A coordination and a proper detailing of inspection chambers and manholes is essential otherwise it becomes a problem and a hindrance in the movement of people.
3. The across road has been provided with a same level as that of footpath, this resolves the problem of level difference for footpath but require ramps for the across road.

**Figure 13: Observations and inferences**



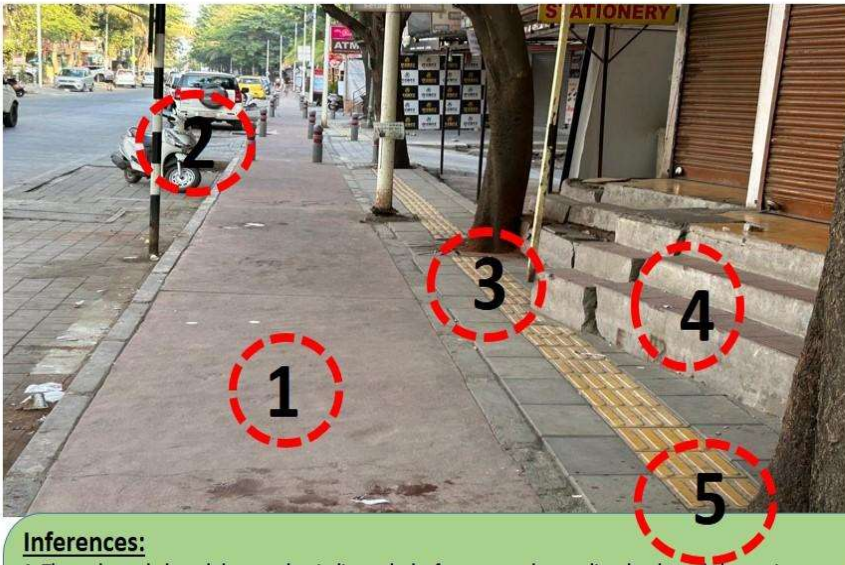
#### Observations:

1. The cycle track.
2. The tactile guiding indicators surface.
3. Electricity Lamp post.
4. A tree on the footpath.
5. RCC Girding surrounding the tree

#### Inferences:

1. A cycle track has been provided but as observed no one is actually riding cycle on this track because there are lots of obstructions, it is being used as a footpath only. This is happening because adjacent to this cycle track is parking of two wheelers throughout the road.
2. Tactile guiding indicators surface has been provided for the vision impaired without having a concern that what all is coming in between the pathway, it just provided for the sake of provision.
3. The tactile guiding indicator surfaces are being obstructed by the trees, electric poles and even the RCC Girding which has been provided around the tree.
4. This is an insensible provision and waste of public money when it is not providing any comfort to the people at large rather creating points of hazards if the tactile directions are followed.

**Figure 14: Observations and inferences**



#### Observations:

1. The cycle track.
2. The parking adjacent to cycle track.
3. The tactile guiding indicator surface.
4. Steps of shops
5. Tactile guide indicator hitting the tree

#### Inferences:

1. The cycle track doesn't have cycles, indicates lack of context understanding, has lots of obstructions too, the adjacent parking is not allowing the cycle users (if any, not visible) to use the cycle track.
2. In Indian context the sides of the roads in every city is being used as parking and in city like Pune the parking is usually full, ultimately not allowing the usage of cycle track.
3. The tactile guiding indicator surface are throughout its length being obstructed by various hurdles.
4. Even the steps of the shops are in between obstructing the thoroughfare of directional movement of persons with vision impairment.
5. And then the Tactile guiding indicator surface is hitting the trees, if followed by the vision impaired will in tern hit him too.

**Figure 15: Observations and inferences**



**Observations:**

1. The cycle track.
2. The tactile guide indicators
3. The bollards.
4. The warning tiles

**Inferences:**

1. The cycle track is not at all being used for the intended use rather it is being used as footpath only.
2. The tactile guide indicators are provided insensibly without a thought about the purpose for which they are provided. Even if a vision impaired person wants to follow the tactile tiles for directions, it is not possible due to the continuous obstructions in the path.
3. The bollards are also provided not with proper in between dimensions which are becoming an obstruction rather a comfort.
4. Purposeless and in sensible provision of warning tiles immediately after the tree and before the bollard.

**Figure 16: Observations and inferences**



**Observations:**

1. Entry to a house.
2. Inspection Chamber.
3. Manhole.
4. The tactile guide indicators.

**Inferences:**

1. Wherever an across entries are there for the houses and shops, at places provided with ramps but at places without any curb cut or ramp.
2. The inspection chamber coming in between not treated as per standards for all round provision of warning tiles.
3. Manhole and chamber obstructing the thoroughfare of movement with tactile guiding indicator surface.
4. The tactile guiding indicator surface has been very insensibly provided for the sake of provision which is not helping anyone.
5. The tactile guiding indicator surface somehow finds its path through the obstructions.

**Figure 17: Observations and inferences**



**Observations:**

1. The tactile guiding indicator surface, the direction tile.
2. The tactile guiding indicator surface, the warning tile.
3. Inspection chamber.
4. The flower pots added by the adjacent house owner.

**Inferences:**

1. The tactile guiding indicator surface provided for the guidance to the vision impaired
2. With warning tiles around the inspection chamber
3. The chambers on footpath.
4. The flower pots added on footpath by the adjacent house owner.

**Figure 18: Observations and inferences**



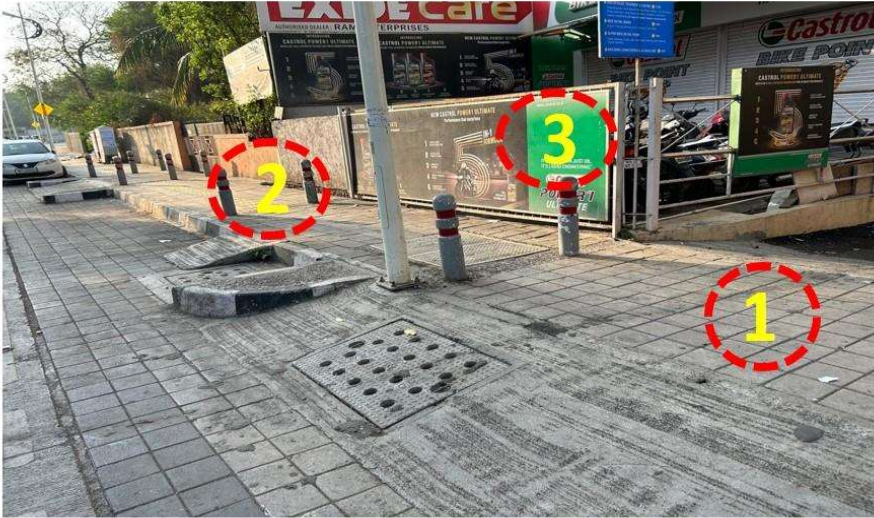
**Observations:**

1. The footpath
2. Across road.
3. Ramp

**Inferences:**

1. The tactile guiding indicators suddenly vanishes with the across road.
2. The across road is devoid of any footpath etc. as is the people will walk only on the main road not across.
3. Ramp has been provided to meet out the level difference.

**Figure 19: Observations and inferences**



**Observations:**

1. The footpath without the tactile guiding indicator surface.
2. Bollards

**Inferences:**

1. The tactile guiding indicator vanishes leaving the vision impaired vulnerable.
2. Bollards provided but they are more hindrance rather than facilitator.
3. Sliding gate, the out going two wheelers has a small ramp to meet out the level difference of footpath.

**Figure 20: Observations and inferences**



**Observations:**

1. The tactile guiding indicator surface, the direction tiles.
2. The tactile guiding indicator surface the warning tiles.
3. The broken footpath

**Inferences:**

1. The tactile guiding indicator surface, the direction tiles vanishes due to lack of maintenance.
2. The tactile guiding indicator surface, the warning tiles vanishes due to lack of maintenance.
3. The footpath is broken due to lack of maintenance.

**Figure 21: Observations and inferences**

**Step 3: Since the actual user, the person with disabilities were not seen using these provision, the family members have been requested to enact and simulate the usage of the tactile tiles by closing eyes and wearing a dark goggle.**



**The survey (simulation):**

1. The vision impaired following the tactile guiding indicator surface (simulation)

**Inferences:**

1. In the three to four days observations no vision impaired person has been seen following the tactile guiding indicators.
2. Thus, simulated the movement of the vision impaired and found that the insensible provision of the tactile guiding indicator surfaces is not helping the movement of vision impaired rather it is hampering it due to obstructions to which the direction tiles leading too.

**Figure 22: Observations and inferences**



**The survey (simulation):**

1. The vision impaired following the tactile guiding indicator surface (simulation)

**Inferences:**

1. The simulated movement of the vision impaired resulted in identification that the insensible provision of the tactile guiding indicator surfaces is not helping the movement of vision impaired rather it is hampering it due to obstructions to which the direction tiles leading too.

**Figure 23: Observations and inferences**

The



#### The survey (simulation):

1. The vision impaired following the tactile guiding indicator surface (simulation)

#### Inferences:

1. The simulated movement of the vision impaired resulted in identification that the insensible provision of the tactile guiding indicator surfaces is not helping the movement of vision impaired rather it is hampering it due to obstructions to which the direction tiles leading too.

***Figure 24: Observations and inferences***

observations with the help of photographs has been done by marking the provisions which has been done on site to understand its purpose of provision and then analyzing with physical observations and denoting it on photographs.

Thus below mentioned is the photographic analysis of the existing conditions;

## **Conclusion**

- The provision of accessible built environments whether internal or external is an essential requirement to facilitate comfort to "All" the diverse users.
- The provisions should be done sensibly, by providing the elements of accessibility with a concern of its proper usage but not to create an additional obstruction to the diverse population.

- **Such efforts require an extensive survey and a proper understanding of the context and with respect to that the provisions should be designed properly.**
- **Only proper design is not essential, it is equally important and essential to execute it as per the design.**
- **In India the work on site is being done by the illiterate labour thus continuous monitoring is essential for the execution and construction as per design.**
- **After construction a proper continuous maintenance is essential.**
- **A sensible design considering the people's needs, aspirations and comfort following the universal design principles can result in achieving the accessible built environments.**

## **Acknowledgements**

- **I am thankful to my faculty namely, Dr. Sandeep Sankat and Ar. Vishakha Verma from whom I have learned regarding the accessible built environment and they supported me throughout this journey of writing this paper.**
- **Thankful I am to the family members, my relatives for supporting me in this endeavor.**



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**Ar Rashmi Abhyankar Associate Professor**

**Aayojan School of Architecture and Design, Pune, India**

***rsa.pune@aayojan.edu.in***

**A practicing architect since last 18 years, an aspiring and hardworking employee with good communication skills. Professional practice under the banner of own firm, Spruha Architects in Pune and working on various architectural, computational and interior projects. 9 years of experience of teaching in Architectural Institutes in Pune and believes in sharing the practical and on field knowledge with the students which help them to grow as a professional. Being passionate about music, has earned her degree as Sangeet Visharad in Vocal Classical Music and also has equal interests in Reading, photography, traveling and crafts.**

# ***Making design more Inclusive- A pedagogical approach for design sensitivity***

***Ar Rashmi Abhyankar Associate Professor***

## **Abstract**

**Inclusive design isn't simply a virtuous concept; rather, it's absolutely essential to design. This research aims to explain the pedagogical approach intended for architecture students, which is based on a human-centered design perspective.**

**Elective course was conducted to develop a sensitive approach in students and guide them to design inclusive spaces with high benefits for a wider user group .The assignments were designed and studio was conducted with the expected outcome to make these future architects more attentive and aware of the difficulties, constraints, potentialities, needs, and resources of the spatial environment for those who live in it. Interactive sessions along with demonstrative activities helped students to understand and experience the requirements of the varied range of user groups.**

**This paper presents the analytical responses from the students for varied urban insert and housing projects. The research is to determine whether this pedagogical approach educates students in empathy, listening, and developing open-mindedness to design better inclusive spaces.**

**Keywords: *Inclusive design, accessibility, universal design principles,***

## **Introduction**

**Inclusive design is an approach that aims to create products, services, and environments that are accessible and usable by as many people as possible, regardless of their age, ability, or background. Inclusive design in architecture focuses on creating spaces that are accessible and usable by individuals of all abilities, backgrounds, and identities. This approach is essential for fostering environments where everyone can participate fully and comfortably.**

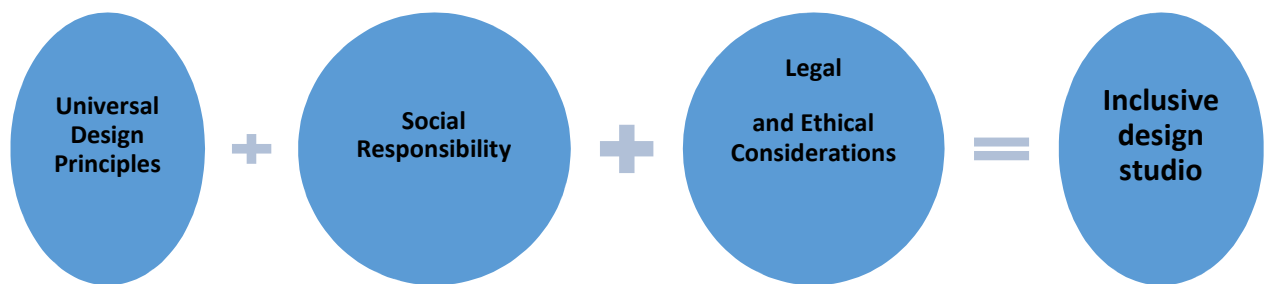
**The integration of an inclusive design approach into architectural education is not only feasible but also essential for preparing students to meet diverse societal needs. This research discusses what aspects of inclusive design could be taught in the architectural curriculum. Various methods have been tried out like book case study analysis, introducing the standards, site visits and live case study, lectures and seminars by experts and demonstrative workshops . This research tries to find out the effective methodology of teaching inclusive design in architecture studios. The research also analyzes how inclusive design approaches could be integrated with architectural design concepts.**

**It is established that accessibility is the key to inclusion and safety is the key to perception to enable participation. To make Inclusive design it is crucial to have an environment conducive to the needs of all. It requires involvement of the vulnerable groups, in thought as well as process to create empowering policies and environments. It is also interesting to observe how various components of accessibility, safety and inclusivity, complement and complete each other.**

## **Inclusive approach in Architectural Curriculum**

As society continues to evolve, the role of designers in creating inclusive spaces will become increasingly vital, ensuring that built environments reflect the diversity of their users while fostering equity and accessibility for all. There could be 3 major aspects to teach inclusive design in the design studio shown in Figure 1.

Teaching inclusive design aligns with universal design principles, which aim to create spaces accessible to all individuals, regardless of their abilities. This approach ensures that environments are welcoming and functional for everyone, including those with disabilities.

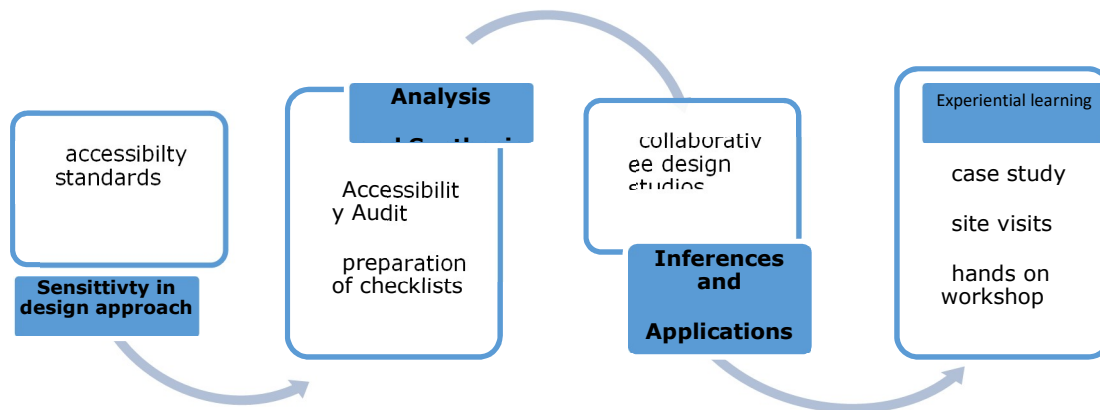


*Figure 1 Aspects of Inclusive design studio*

There are strong legal and ethical imperatives for teaching inclusive design. Compliance with regulations like RPWD-Act-2016 (Department of Empowerment of Persons with Disabilities, 2016) is crucial in architectural practice, making it essential for students to understand these requirements during their education. Handbook on Barrier Free and Accessibility can also be referred for developing clear and concise technical design guidelines for creating Barrier-free spaces through Architectural Designs which eliminate the type of barriers and hindrances that deter physically limited persons from having access to and free mobility in and around a built environment (Ministry of Urban Development Govt of India , 2014).

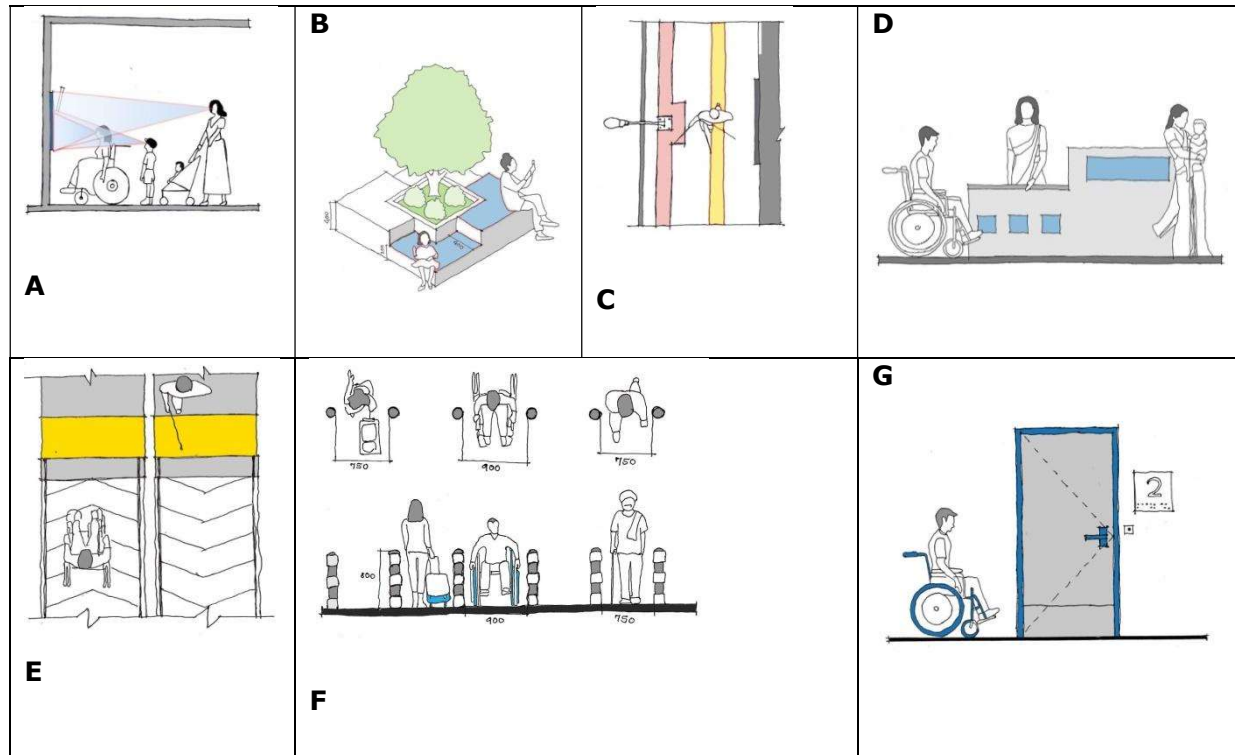
Architects have a social responsibility to create environments that foster equality and accessibility. By incorporating inclusive design into their training, students can develop a mindset that prioritizes the needs of all users, thus promoting social equity within their future project.

The inclusive design process is dynamic and requires a commitment to understanding user diversity at every stage. By implementing the steps as shown in Figure 2, designers can create environments and spaces that not only comply with accessibility standards but also enhance the overall experience for all users.



*Figure 2 Process for Inclusive design approach*

**Universal Design Principles:** Introduce universal design as a core concept in the curriculum. This includes teaching students about accessibility standards and how to create spaces that are usable by everyone, regardless of age or ability. Figure 3 indicates the output from the assignment given to the students to understand these principles from case examples.



**Figure 3 Universal Design Principles Assignment -ASAD , Neeraj S SEM-8 ELECTIVE**

**Equitable use-**The design is useful and marketable to individuals with varied abilities. Everyone irrespective of their age, stature, ability or disability should be able to use a product or a space. In this sketch A Figure 3, the information display board is placed at such a height so that each and every individual can refer to it.

**Flexibility in use** The design accommodates a wide range of individual preferences and abilities. The sketch B Figure 3 highlights the outdoor sitting with level difference. The level difference creates a scope to use space for both children as well as adults.

**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. The sketch C Figure 3 shows how the user

uses and understands configuration and layout of tactile guiding and warning tiles.

**Perceptible information-** The design should be capable of communicating the most relevant information to all people that will result in effective usage of the design. The sketch D Figure 3 shows how the user uses and understands configuration and layout of tactile guiding and warning tiles.

**Tolerance for error-**There should be high tolerance for errors in design. Safety precaution is the main idea for this principle. As shown in sketch E Figure 3, it is important to note that ramps require to be well laid and implemented keeping in mind the needs of persons with disabilities especially wheelchair users along with ones requiring high support needs.

**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. The sketch F Figure 3 shows those wheelchair users, or an individual with luggage, or even an obese individual can easily enter the subway gates.

**Low physical effort:** The design must be such that the people need to make the minimal effort to operate or function a product or a design. The driving force behind this principle is convenience of people and ease of use. The sketch Figure 3 highlights a lever handle that can be used by people with limited strength in their hands as well as can be used by people carrying shopping bags. Thus, the door can be opened with a close fist or an elbow.

Emphasizing flexible design solutions can help students learn to accommodate a wide range of user needs. Teaching inclusive design



aligns with universal design principles, which aim to create spaces accessible to all individuals, regardless of their abilities. This approach ensures that environments are welcoming and functional for everyone, including those with disabilities.

***Analyze standards and codes for Inclusive Designs:*** Discuss examples of inclusive design in various contexts, such as schools, public buildings, and transportation hubs. Analyze how these projects address the needs of diverse users and the impact they have on the community. Inclusive resilient strategies are available as reference in the Harmonized Guidelines (NIUA and MoHUA).

***Emphasis on Ethics and Responsibility:*** Discuss the ethical implications of inclusive design in architecture courses, highlighting the responsibility architects have towards creating equitable spaces. This can be reinforced through discussions on legislation like Rights of Persons with Disabilities Act, 2016 (Department of Empowerment of Persons with Disabilities, 2016) and its impact on architectural practice. The inclusive design can be achieved following the harmonized guidelines and standards for universal accessibility in India. The Harmonized Guidelines for Universal Accessibility have evolved after reviewing NBC 2016 Guidelines, technical discussions with CPWD , Online perception surveys , consultation with stakeholders (Ministry of housing and urban affairs Government of India , 2021). The stage wise compilation with reference to the case studies makes these guidelines more suitable for a wider range of user groups.

The three key features of the guiding approach being viz. bringing a shift from barrier free to universal design approach, evolving visual contextualization and enhancing readability towards ease in

**implementation (Ministry of housing and urban affairs Government of India , 2021).**

**The Digital Guide on 'Inclusive, Accessible, Safe and Resilient Urban Development' contains an' Integrated Toolkit for Development of Inclusive Urban Environment' (NIUA and MoHUA).**

**These checklists focus on an inclusive approach to urban planning, design, and implementation of all public infrastructure projects to ensure compliance with accessibility guidelines and standards set forth by the Ministry of Housing and Urban Affairs (MoHUA), Government of India. The guidelines and standards aim to ensure accessible and inclusive urban spaces for all citizens in India (NIUA and MoHUA). The assignments could be created to study these guidelines and conduct the accessibility audits learn the approach of inclusivity in spatial designs.**

**Accessibility Audits:** These live site case studies also help to conduct accessibility audits of existing buildings or spaces. Students can use checklists based on Harmonised Guidelines & Standards For Universal Accessibility In India 2021 to identify barriers and propose solutions to improve accessibility


**Organize Site Visits for live case study:** Use case studies of successful inclusive designs in various contexts, such as schools, public buildings, and residential spaces. Analyzing these examples can help students understand the practical application of inclusive design principles and the impact they have on community's .Arrange site visits to spaces that exemplify inclusive design principles. These visits can help students understand how theory translates into practice and inspire them to apply these concepts in their own

designs. The table explores some of the examples of student’s output. The assignment was given to explore the public spaces in urban context and find out the requirement of inclusivity in these urban spaces.

**Invite Guest Speakers:** Invite architects, designers, and accessibility experts to share their experiences and insights on inclusive design. These guest speakers can provide valuable feedback on student projects and inspire them to incorporate inclusive principles. Attending seminars or conferences to the related topic may help to sensitize students' role of inclusivity in designed spaces. Figure 4 contains the student’s learning from the expert lecture.


### 2. CLASSIFICATION

- **EXCLUSION** People are excluded from major society
- **SEGREGATION** formation of Major and Minor Society
- **INTEGRATION** Within in major society minor one exists
- **INCLUSION** Anyone could use with no distinction



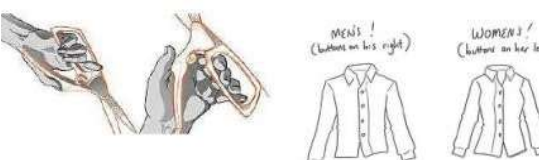
### 1. BIASES

It's a belief system which is set up by people through due course of time. There are certain biases which are so must deep rooted that they are not considered while designing.



#### LEFT HANDED PEOPLE

It's a belief system which is set up by people through due course of time. There are certain biases which are so must deep rooted that they are not considered while designing.



**Figure 4 Lecture notes -Source: ASAD assignment - elective Priya T**



**Figure 5 Inclusive design workshop at Aayoajn School of Architecture and Design,Pune by Ar Parul Kumtha Mumbai**

**Experiential Learning:** Incorporate hands-on projects that require students to engage with individuals from diverse backgrounds, particularly those with disabilities. This could involve site visits, interviews, or collaborative design sessions with users who have varying needs, allowing students to understand real-world challenges and solutions. Figure 5 images show the experiential learning attempt by students in ASAD campus.

Hands-on workshops play a crucial role in fostering a deeper understanding of inclusive spaces by actively engaging participants in experiential learning. These workshops are designed to create environments where individuals can explore concepts of diversity and inclusion through direct interaction and collaboration

- A very engaging and interactive session for sensitizing students about the need for inclusivity in Design and understanding and experiencing the requirements of the varied range of user groups.
- Workshop conducted was a cohesive one where we went through trying out different supports like wheelchairs, walker , clamps etc.
- After having a hands on experience we got to know about the anthropometry of the gadgets.
- How to use them and the ideal slope conditions required for the wheelchair.
- Opening size , turning radius
- And also emotions or what someone feels while sitting on a wheelchair or using walker , or blind stick etc.

**Figure 6 Student's feedback on Inclusive Design workshop at ASAD**

**Simulation and Role-Playing:** Implement simulations where students must navigate spaces as if they have various disabilities (e.g., visual impairments, mobility challenges). This immersive experience can enhance empathy and understanding of the barriers faced by different users.

**Reflective Writing:** Assign reflective writing exercises where students reflect on their experiences with the exercises and how they have influenced their understanding of inclusive design. Encourage them to consider their own biases and assumptions and how they can become more inclusive designers. Using digital interactive tools like [mentimeter.com](https://www.mentimeter.com) or writing the articles could be encouraged.

## Importance of inclusive design thinking in design process

Mentimeter



**Figure 7 Assignment elective studio ASAD**

**Feedback from Users:** Involve users with disabilities in the design critique process. Their insights can provide valuable feedback on designs and help students learn how to incorporate user-centered principles effectively. The feedback survey or interviewing could help to give more appropriate design solutions.

**Collaborative Projects:** Encourage interdisciplinary collaboration with other fields such as psychology, sociology, and special education. This approach can provide architecture students with broader perspectives on user experience and the social implications of their designs.

**Inclusive Wayfinding:** Have students develop inclusive wayfinding systems for a building or campus. They should consider the needs of

users with visual, cognitive, or language barriers and incorporate tactile, auditory, and visual cues.

**Flexible Design Solutions:** Challenge students to design spaces that can accommodate a wide range of users and activities. For example, ask them to design a classroom that can be easily reconfigured to support different teaching methods and learning styles.

**Design studios:** Organize design studios where students work in teams to solve specific design challenges related to inclusivity. Also they would study and learn about the project life cycle (NIUA and MoHUA).

These collaborative workshops can stimulate creative problem-solving and allow students to explore innovative solutions while receiving feedback from peers and instructors.

Inclusive design Activities can be decided considering the 4 main stages of any design project.

The stages cover processes that are relevant for everyone involved in projects, including developers, architects, planners, clients, community groups and project managers. Roles and responsibilities differ according to size, scale and context, and will change from activity to activity.

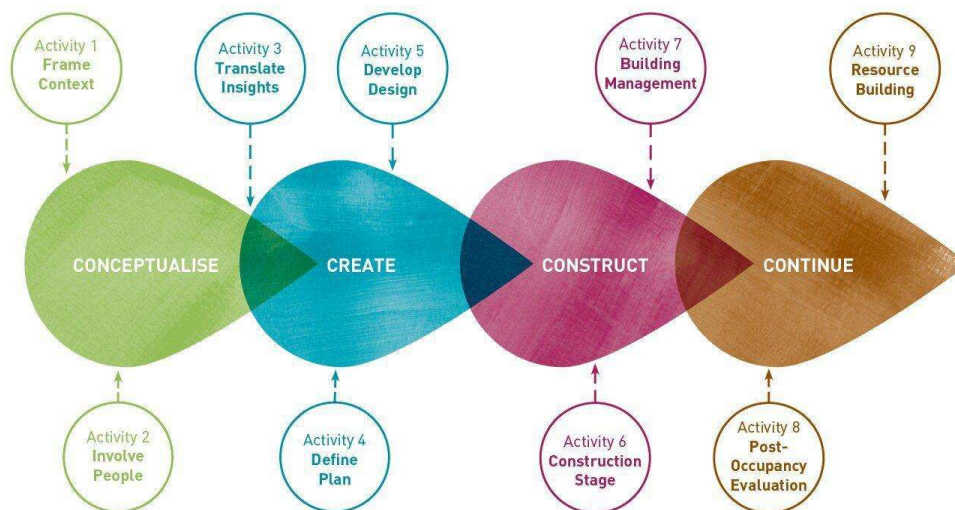
**Stage 1 - A starting point will be to set a vision that defines the aspirations and focus for a project**

**Stage 2 - It is a process of evolution, balancing an architect's ideas and sensitivities with stakeholder need and participation**

**Stage 3 - It is a process of evolution, balancing an architect's ideas and sensitivities with stakeholder need and participation**

**Stage-4 It is a process of evolution, balancing an architect's ideas and sensitivities with stakeholder need and participation.**

**This illustration o shown in Figure 8 outlines typical architectural process from briefing through construction to handover. It is simplified into four main stages. A number of Inclusive Design activities can be added at different points to enhance the project (Zagreb, 2022).**



**Figure 8 TYPICAL STAGES AND ACTIVITIES FOR ARCHITECTURAL DESIGN PROCESS (Zagreb, 2022)**

**The activities could be listed as below**

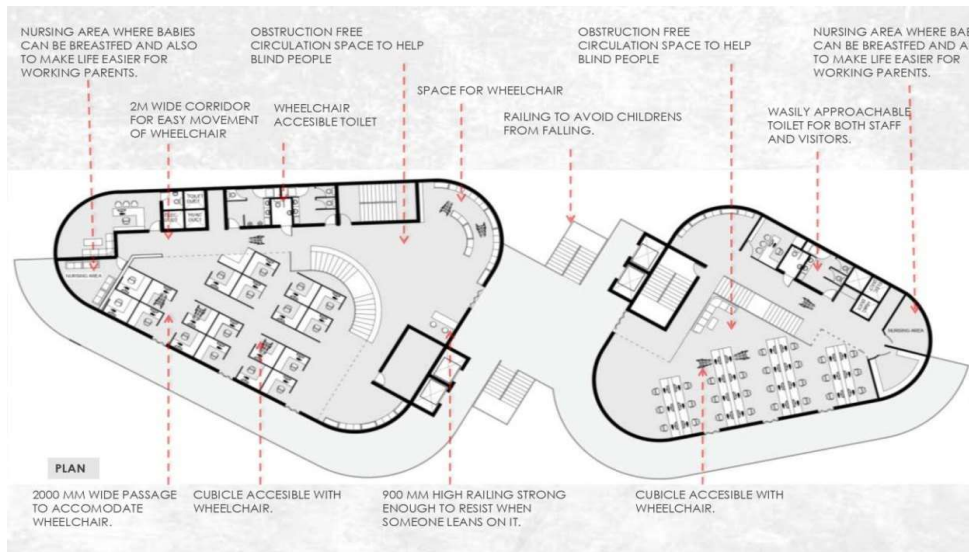
- **Translate Briefs-Create design briefs that are Built on ideas that have the most essential**
- **Scenario Building- Generate ideas in response to those scenarios and virtually test ideas from a particular user's perspective.**

- **User Feedback** -mock-ups should be tested with a range of users to verify design solutions, record initial market reaction and fine tune details.
- **Resource Building** knowledge and experience that can be passed on to Sheer projects and colleagues should be organized and stored in a way that can be easily accessed either physically or digitally.
- **Understand Context**- better understanding of the context surrounding, firm basis for moving forward, as well as people-inspired insights and direction.
- **Design Research**- to get a significant amount of insights from the users you decide to work with.
- **Discover Needs** put your planning into action and go out to work with users to understand their problems, needs, desires and aspirations.
- **Map Insights**-Review and analyses all the information to identify key themes and opportunities. Extracting the right insights will lead to new ideas or designs.

**Overall the objective for the design studio could be to inculcate Design development process adding the value of a people-centered approach without disrupting existing practice.**

**Integration of inclusive design concepts in 4<sup>th</sup> year urban insert design studio tried out and Figure 9 shows one of the responses by a student in corporate office design.**





**Figure 9 Inclusive design concepts Urban Insert Project - Source: ASAD Assign Ajay M**

**Inclusive design is a methodology aimed at creating products, services, and environments that are accessible and usable by as many people as possible, regardless of their abilities or backgrounds. In the early stages of design, implementing inclusive principles is crucial to ensure that diverse user needs are met effectively and affordably.**

## **Challenges and Considerations**

**While there is a clear benefit to teaching inclusive design, challenges remain:**

**Resistance to Change:** Some educators may resist altering traditional curriculum to include inclusive design principles, fearing it may compromise other essential architectural skills.

**Resource Allocation:** Implementing comprehensive inclusive design education may require additional resources and training for faculty, which could be a barrier for some institutions.

**In conclusion, teaching an inclusive design approach in architectural education is not only possible but necessary to equip future architects with the skills needed to create accessible and equitable environments. By embracing this approach, educational institutions can foster a generation of architects committed to inclusivity in their practice.**

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### **Ar. Rupesh Kochure M.Arch (Urban Design), B.Arch**

**Ar. Rupesh Kochure is a skilled Architect, Urban Designer, and Academician with over nine years of experience in both academia and professional practice. A graduate of the School of Planning and Architecture, Bhopal, he has a deep passion for integrating graphics and design into the architectural and urban landscape. His academic focus has always revolved around graphics, seeing it as a crucial element in teaching and understanding design. Urban design, in particular, has broadened his perspective on how visual elements significantly influence the way cities and everyday urban life are shaped. Rupes has conducted numerous exercises for students, emphasizing the role of graphics in various formats. His teaching covers a wide range of topics, including poster-making for awareness campaigns, brochure and product design, as well as presentation techniques. He encourages students to explore different mediums, colors, and graphic styles to enhance their creative skills and design thinking. Through his work, Rupesh Kochure strives to bridge the gap between theory and practical application, ensuring that students not only grasp the technicalities of design but also understand the broader social and cultural implications of graphics in urban environments.**

# **GRAPHIC DESIGN AND ACCESSIBLE GRAPHICS FOR ALL**

**Ar. Rupesh Kochure**

## **Abstract**

**In the digital age, graphic design is a critical tool for conveying messages effectively and inclusively. However, many designs overlook accessibility, leaving some users—particularly those with disabilities—unable to engage fully with visual content. This paper explores the significance of accessible graphic design, emphasizing the need for inclusivity for people with diverse needs. Key topics include color contrast, legibility, alternative text (alt-text), and compatibility with assistive technologies, such as screen readers. By presenting best practices and design principles, this article underscores the importance of creating visual content that is accessible to all individuals, thereby enhancing user experience and broadening the reach of digital media.**

**Keywords: accessible design, inclusive graphics, universal design, visual accessibility, assistive technologies, digital communication, WCAG compliance**

## **Introduction**

**Graphic design is a powerful medium for conveying information, values, and ideas visually. In the digital era, its role has expanded, shaping user interactions, marketing, education, and content consumption. Despite digital communication's broad reach, accessibility challenges remain a pressing issue, particularly for those**

**with disabilities. Without inclusive design, many users are unable to engage with visual content fully.**

**Accessibility in graphic design involves creating visual media that ensures individuals with disabilities—whether visual, auditory, cognitive, or motor impairments—can effectively consume information. This paper examines the principles of accessible graphic design, emphasizing the importance of inclusivity and strategies designers can use to make their work accessible to all. As the demand for inclusive design grows, accessibility must be integrated into the creative process as an essential component.**

## **Background**

**Accessible design originated from efforts to remove barriers encountered by people with disabilities in physical and digital environments. Guidelines such as the Web Content Accessibility Guidelines (WCAG) and legislation like the Americans with Disabilities Act (ADA) were introduced to improve digital accessibility. However, many designs still fail to meet these standards, excluding individuals with disabilities from full engagement.**

**Accessible graphic design goes beyond legal compliance; it reflects an ethical commitment to serve individuals with diverse needs. Designing with accessibility in mind from the outset leads to more inclusive and effective communication. By adopting accessible graphic design practices, designers can reach a broader audience, enhance user experience, and contribute to a more equitable digital landscape.**

## **Aim and Objectives**

**This paper aims to:**

- 1. Define and clarify the importance of accessible graphic design.**
- 2. Outline best practices for creating inclusive visual content.**
- 3. Discuss challenges of implementing accessible design principles.**
- 4. Offer practical guidance for designers aiming to make their work accessible to all users.**

## **Methodology**

**This study is based on a literature review of accessible design practices, WCAG standards, and case studies of successful inclusive design implementations. Interviews with graphic designers specializing in accessibility provide practical insights. By integrating qualitative and quantitative approaches, this paper offers a comprehensive overview of the current landscape of accessible graphic design.**

## **Scope and Limitations**

**This paper focuses on digital graphic design for websites and mobile platforms. While the accessibility principles discussed may apply to print design, the emphasis is on visual content in the digital domain. Technical aspects related to coding, development, or programming are beyond the scope, as the focus here is on visual design processes.**

## **Key Principles for Accessible Graphic Design**

- **Color Contrast**

**Color contrast is essential for making text and visual elements legible for visually impaired users. Adequate contrast ensures readability; for instance, users with color blindness may struggle with similar shades. Designers can use contrast-checking tools to assess their designs, ensuring they meet WCAG standards.**

- **Legibility and Font Choices**

**Font selection and text layout significantly impact accessibility. Fonts should be legible, with adequate size, spacing, and line height. Sans-serif fonts, typically more accessible for individuals with dyslexia, improve readability. Designers should avoid overly decorative fonts that may reduce legibility.**

- **Alternative Text for Images (Alt-Text)**

**Alt-text is essential for screen reader users, providing a textual description of images to offer context. Designers should ensure all visual content includes descriptive and meaningful alt-text to improve accessibility for screen reader users.**

- **Consistency in Design Layout**

**Consistent layouts and clear navigation benefit users with cognitive impairments, helping them understand and engage with content. A well-organized design enhances usability and ensures that all users can interact with content effectively.**

- **Compatibility with Assistive Technologies**

**Users often rely on assistive technologies, such as screen readers, magnifiers, or braille displays, to navigate content. Designers must test compatibility by using assistive tools, ensuring visuals are**



**accessible. Proper HTML tagging and structure can enhance screen reader navigation.**

## **Tools and Innovations Supporting Accessible Design**

- **Adobe Accessibility Features**

**Adobe's design tools, like Illustrator and Photoshop, include features that support accessible design, such as color contrast checking, alt-text, and visual impairment simulation.**

- **Figma Accessibility Plugins**

**Figma plugins, such as Stark and Contrast, help designers evaluate visual accessibility, testing color contrast, colorblindness compatibility, and WCAG compliance.**

- **Automated Accessibility Tools**

**Tools like Lighthouse and Axe allow designers to test websites and digital products for accessibility issues, offering detailed reports and recommendations for improvement.**

## **Challenges of Implementing Accessible Design Principles**

- **Lack of Awareness and Education**

**Many designers lack knowledge of accessibility principles and the tools available for implementation. Design education programs often do not cover accessibility extensively, leaving new designers underprepared.**

- **Balancing Aesthetics and Accessibility**

**Some designers view accessibility as a constraint on creativity, fearing it will reduce design appeal. However, accessible design**

can coexist with creativity, requiring thoughtful visual consideration for diverse users.

- **Time and Resource Constraints**

Implementing accessible design practices can require additional time, testing, and resources, which may be challenging for projects under tight deadlines and budgets.

- **Resistance to Change**

Resistance to accessible design can be high in organizations focused more on aesthetics than functionality. Promoting accessibility as a core design element requires shifts in attitude and culture among designers and stakeholders.

## **Findings**

Despite growing awareness, research indicates that only a small percentage of websites and digital platforms meet accessibility standards. A report by the World Wide Web Consortium (W3C) revealed that less than 10% of websites achieve WCAG compliance (W3C, 2018). However, companies like Apple, Microsoft, and Google have shown that prioritizing accessibility leads to better user experiences and greater satisfaction, benefiting all users through improved usability and inclusivity.

## **Conclusion**

Accessible graphic design is not optional in today's digital landscape; it is essential. By prioritizing inclusivity, designers create visual content that reaches a wider audience, ensures equal information access, and enhances user experience. Accessibility principles should be incorporated from the beginning of any design project. As digital

**media advances, embracing accessibility as a design responsibility will help create a more inclusive, equitable society.**

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