

# **ACCESS AUDIT REPORT**

## **DELHI UNIVERSITY NORTH CAMPUS**

**16<sup>th</sup> & 17<sup>th</sup> May 2006**

By



# **SAMARTHYA**

**NATIONAL CENTRE FOR PROMOTION OF BARRIER  
FREE ENVIRONMENT FOR DISABLED PERSONS**

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## INTRODUCTION

Samarthya greatly appreciates University of Delhi for its commitment to promote “Access for All”, especially for visitors/students/staff with reduced mobility and disabilities.

Keeping with the spirit, an access audit of Delhi University was conducted by Samarthya. It may be made clear that access audit is not a fault finding exercise. The objective of the access audit was to assess the existing facilities and suggestions for further improvement.

During the audit, the team observed various features which must be commended. For example flooring tactile changes at intersections, including kerb stones and edge protection at the green area, which serve as good orientation cues for students with low vision and vision impairment. Also Utility Centre is an excellent example of Universal Design and with some amendments can become a model.

The Access Audit team met Professor Deepak Pental, Vice Chancellor (VC), the Registrar and Prof S. K. Vij, Dean, Student’s Welfare and appreciate their endeavor in making DU barrier free. The team also thanks Prof. R. K. Agnihotri for initiating the process.

An Access Audit of following sample areas of North Campus was conducted:

1. Roads & pathways/walkways
2. Entrances to the campus
3. Main Gate no. 3- drop off zone
4. Parking
5. Dean office (Dean Students’ Welfare)
6. Vice Chancellor Building
  - a. VC room
  - b. Registrar room
7. Utility building

8. Examination counter/windows
9. Administrative Block
10. Science Block
11. Coffee House
12. General circulation area
13. Public facilities (Toilets, drinking water facility etc.)

All measurements are in millimeters.

All recommendations start with bullet mark.

## **EXTERIORS**

### **Roads & pathways/walkways**

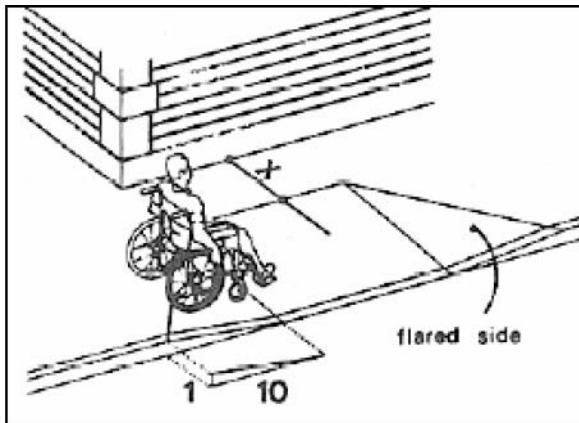
Approach foot-path on both sides of the main gate is 1200 mm wide and 160 mm high, abruptly ending against the side entrance gate.

It is proposed to provide kerb cuts on both the sides (on the footpath) as per the dimensions mentioned below.

Pavement should be dropped, to be flush with roadway, at a gradient no greater than 1:10 on both sides of necessary and convenient crossing points.

Width of the payment should not be less than 1200mm.





There are two entrances for entering this complex. However the entrance

from Gate no. 3 (i.e. the main gate) is selected for making accessible to all.

**Entrance gate** for vehicles is swing type metal gate, and separate pedestrian entry gate on either side, remains locked. All visitors/students/others are forced to enter from one gate only, which is not safe for students/students with disabilities and may lead to accidents by the vehicular movements.

**Pedestrian entrances** should be left open.

Signage for the pedestrians including **access symbol** to be provided at these gates.



## SIGN BOARD

Signboards to be provided at strategic locations (one at the main road and other at the main entrance), with directional arrows.

All signages to be mounted 2000mm above the footpath level, facing the

main road.  
The individual characters to be bold & colour contrasted with their background.



Kerb stone provides orientation clue to students with vision impairment. However, on reaching the main gate, the clue is lost as it leads to closed entrance. As suggested earlier the same need to remain open.

Cobbler stone flooring (due to unevenness is not advised for flooring) as it causes inconvenience to students with mobility impairments using mobility



aids like wheel chairs, crutches, walkers etc.

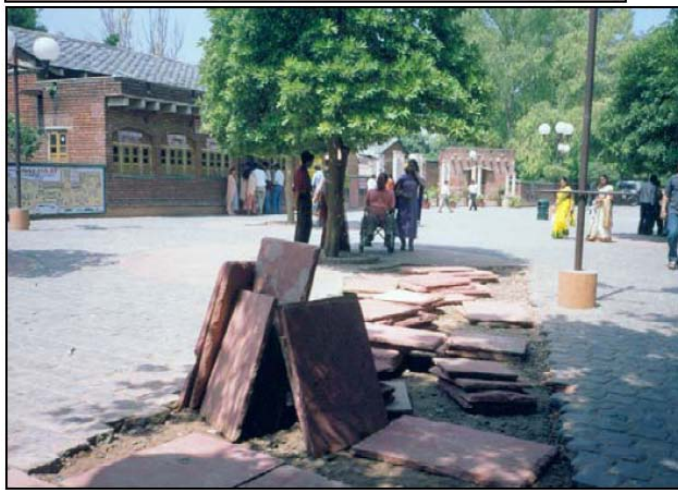
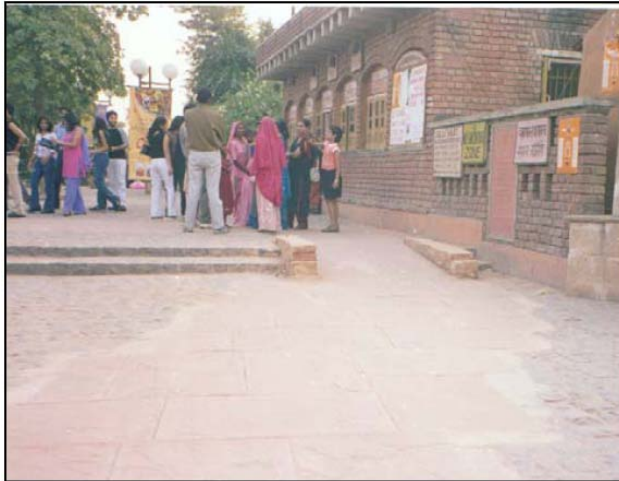
For orientation and to avoid the above mentioned problem; it is suggested to provide a tiled pathway (900mm min. wide), preferably in colour contrast, on both the sides of the pedestrian entrance, on the cobbler stone.



Existing cobbler stone flooring  
kerb stone

Proposed pathway next to

Photographs from Dilli Haat- construction process of leveled pathway on the



Cobbler stone flooring

**Guide map** of the area/buildings in this complex to be installed, near the main entrance, before the DSW office building.



(For example: as shown in photograph of IIPA)



## PARKING

There is ample parking space for scooters and cars.

Reserved parking for PwDs is proposed just opposite the DSW building and next to the Administrative block.



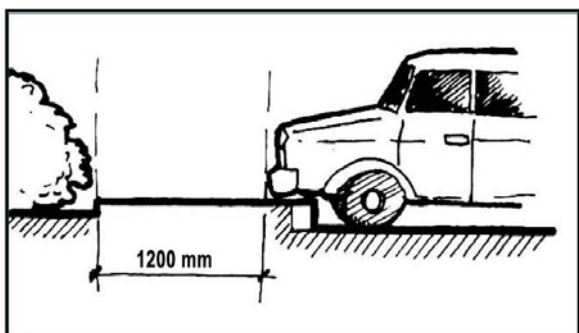
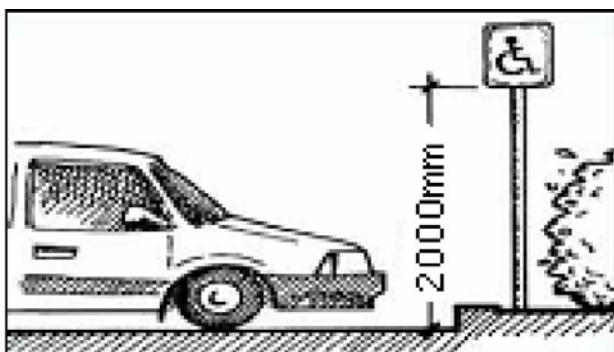
### **Reserved parking**

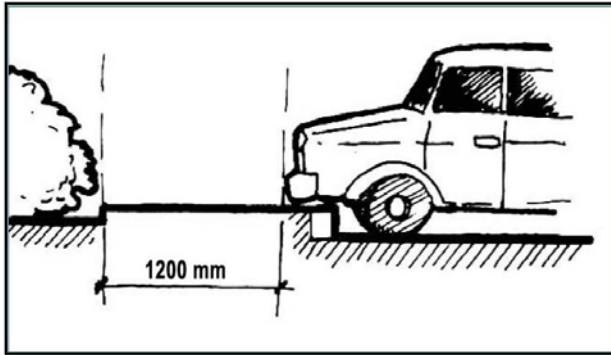
#### **Parking should be with in**

Two accessible parking lots with overall minimum dimension 3600mm x 480 should be provided.

It should have the international signage painted on the ground and also on a signpost\ board put near it. **There needs to be direction**







Proposed signage for reserved parking

**Dean Student's Welfare** office is on leveled flooring and an excellent example of "Mobility for All".



**For students with vision impairment all buildings to have:**

A strip of **warning blocks** is proposed at 300mm before the entrance.

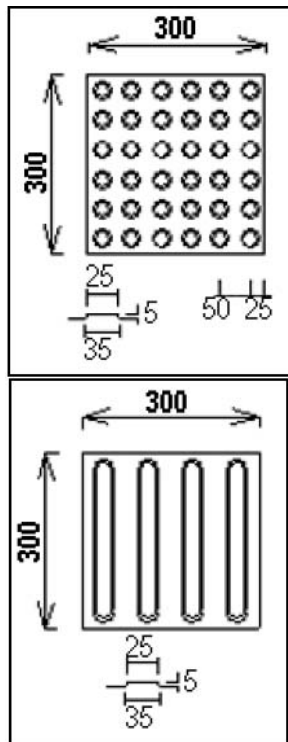
On the right side of the main entrance it is proposed to install a **Braille Tactile map** to orient students with vision impairment.

### **Tactile Surfaces / Guiding strip & Warning blocks**

**Line-type blocks** indicate the correct path/route to follow.

**Dot-type blocks** provides warning signal, to screen off obstacles, drop-offs or other hazards, to discourage movement in an incorrect direction and to warn of a corner or junction. Should be placed 300mm at the beginning and end of the ramps, stairs and entrance to any door. Line-type blocks indicate the correct route to follow.





**Places to install guiding blocks:**

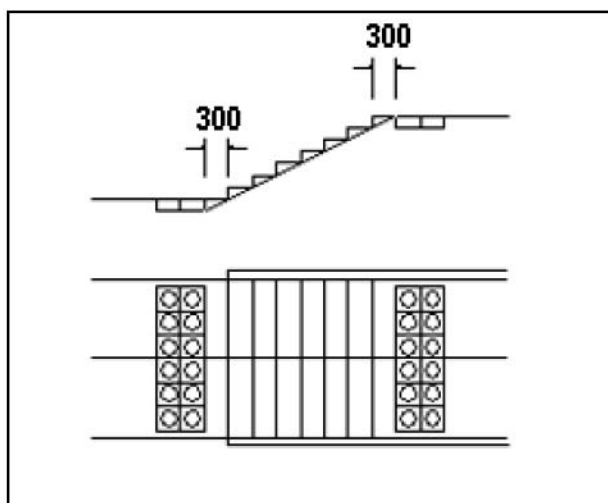
In front of an area where traffic is present.

In front of an entrance/exit to and from a staircase or multi-level crossing facility.

Sidewalk section of an approach road to a building.

In open space to orient students with vision impairment.



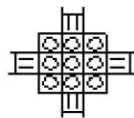
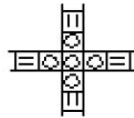


## STAIR AND CROSSWALKS

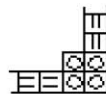
**Guiding path**  
**Warning strip**

## Arrangement of guiding blocks for persons with visual impairment

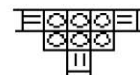
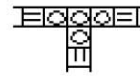
**EXAMPLE OF  
INTERSECTION**



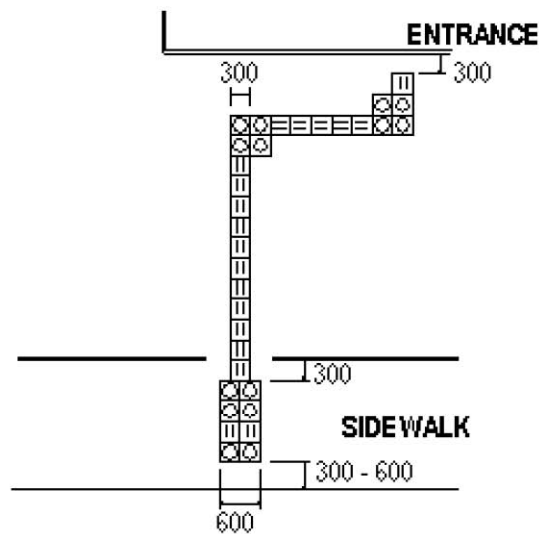
**EXAMPLE OF L-SHAPED  
INTERSECTION**



**EXAMPLE OF T-SHAPED  
INTERSECTION**

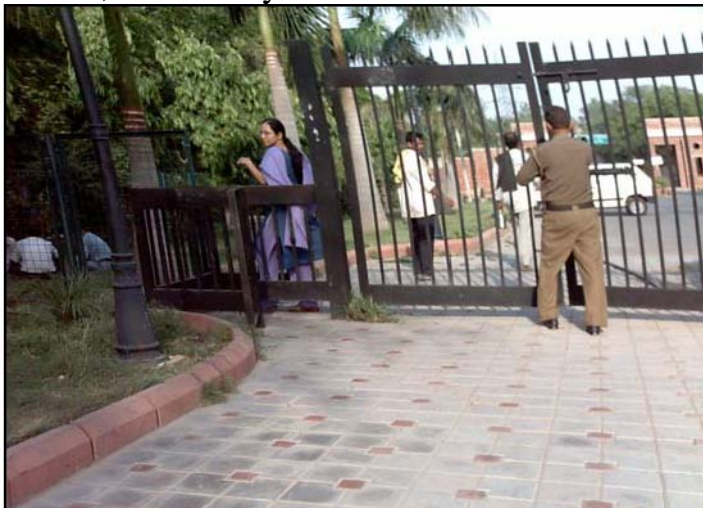


### Guiding path and approaching sidewalk to the building



## **Vice Chancellor Building**

There are two wicket gates on either side of the main gate (which is locked, for security reason)



As it is difficult for students with reduced mobility and for students using mobility aids to pass through; one of the wicket gates can be replaced by swing type.

Minimum width to be 900mm to allow a wheel chair to pass through.



Tiled pathway is better flooring as compared to cobbler stone.

This building is marked by two steps and both tiled and cobbler stone flooring.



**Flooring:** to be have a leveled pathway from the iron gate, leading to the step entrance.

**Ramp:** permanently to be provided on the left side as per the dimensions mentioned below.

Ramp texture to match the existing tiles of the flooring.







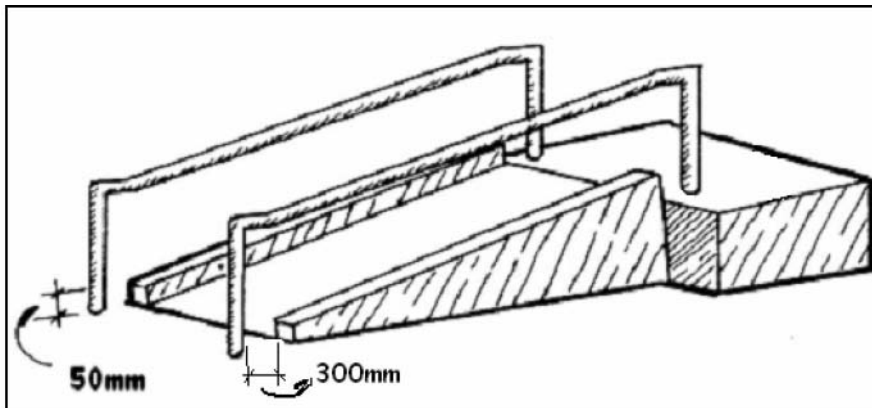
Existing      Proposed

Gentle slope (1:12 minimum).

Landings (every 750 mm of vertical rise). Width (1200 mm or more).

Handrails to be on both sides at a height of 850mm-900mm; both ends to be rounded and grouted and extend 300mm beyond top and bottom of ramp.

Surfaces (ramp + landing) should be slip resistant.



Braille plates with the name of the office/room of the officer, for students with vision impairment on all handrails to be provided.

## **MEETING ROOM**

The doors are wide enough and there is adequate space around the table in the meeting room.



Signage for all the rooms to be modified and to be as per the standards mentioned below.

## **SIGNAGES**

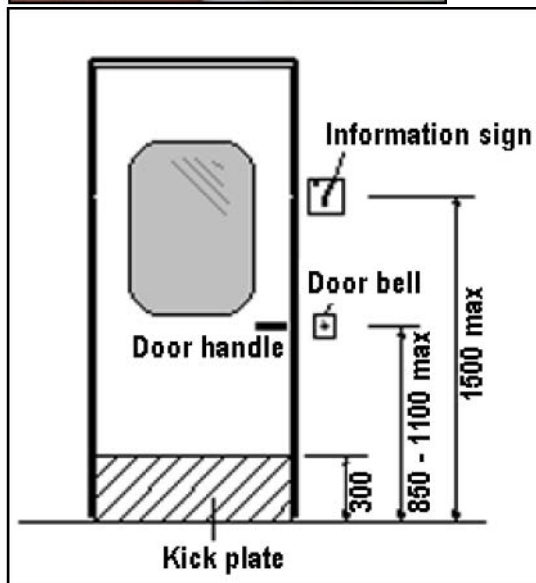
Signages outside rooms are mounted too high and are not clearly visible. There are planters just below the name plate and in the circulation area.

**Signs** should be mounted between 1400mm and 1700mm from floor level (preferably on right side of all doors).

The individual characters between 15mm-50mm tall and raised by 1-1.5mm.

**Signage, nameplates and numbers of the rooms** to be in Braille & raised

alphabets at the eye level, on the wall, bold & color contrasted with their background.



## **FOOT MAT**

Good orienting cue for students with vision impairment. It can be replicated for entrance to all other buildings and room entrances.

However the coir mats used at present, are too thick- people can trip on them and does not allow free movement of mobility aid users.

All foot mats to be embedded in the ground in a niche.

Alternatively rubber foot mats can replace the coir mats.



Wheels of the wheelchair can get stuck in thick coir foot mats

## **REGISTRAR'S ROOM**



The doors are wide enough and there is adequate space around the table in the Registrar's room.

### **VC's ROOM**

During the access audit of the VC building, the audit team also had a fruitful meeting with the VC. Audit team sincerely puts on record, the concern expressed by the VC regarding inadequate access features for students with disabilities. The VC was forthcoming and firmly assured to take all necessary actions to make the Delhi University "Accessible to All".







## **UTILITIES CENTRE**

This is a recently constructed building wherein access to ground floor and first floor is provided through ramps.

This centre could be a model of Universal Design with implementation of few modifications mentioned below.



## **Signage**

To be in bold and colour contrast, placed 2000mm above the floor level.

## **Reserved Parking**

Parking for at least one car and one scooter/tricycle, opposite the ICIC ATM counter is proposed, as per the standards mentioned earlier.



## **GROUND FLOOR**



**Colour contrast in the steps and flooring are good orientation clues for students with low vision.**

For the ramp:

Strip of warning blocks should be provided 300mm before the beginning and end of ramp. (Refer drawing)

## STATE BANK OF INDIA



Access audit team observed that it was difficult for the wheel chair to pass through the narrow door as there was a fixed iron grill.

Internally the counters, circulation area and other amenities are beautiful examples of universal design.

However, the floor was slippery.

(Photography was not permitted, therefore no examples are shown).



To provide non slippery finish- PVC strip (900mm wide) is proposed from the entrance door leading to different service counters, preferably in bright & contrasting colour to the flooring. This also helps as orientation cue for students with low vision and vision impairment.

## **POST OFFICE**

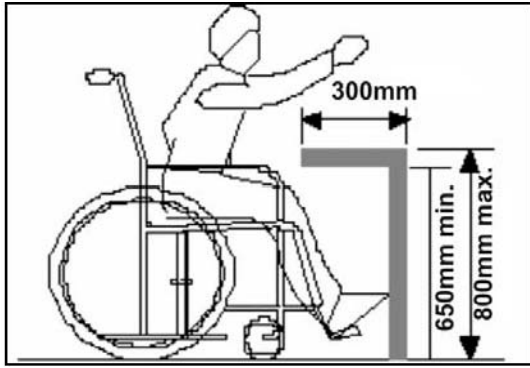
Counters are very high 1020mm- not accessible for wheelchair users and short stature students.

## **SERVICE & INFORMATION COUNTERS**

Writing surfaces and public dealing counters should not be more than 800mm from the floor, with a minimum clear knee space of 650mm-680mm high and 280mm-300mm deep.

A part of the counter to be lowered down as per the sketch.

Alternatively a single window facility is proposed with the lowered counter





Existing

Proposed  
**RAMP FOR THE FIRST FLOOR**

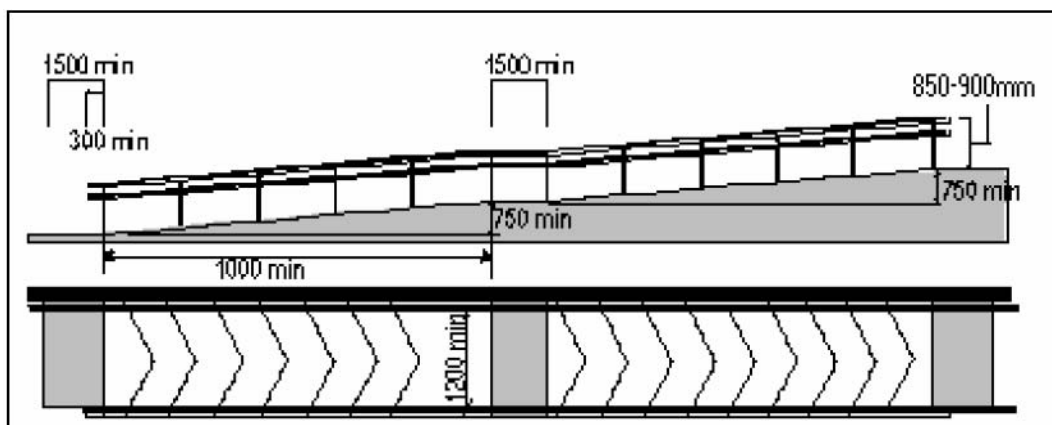
**Although the ramp was steep, however with assistance it was possible to reach the first floor.** Handrails were not continuous and were too high-1000mm.

It is strongly recommended that gradient of the ramp should not be more than 1:12 and for longer ramps should be 1:20.

Landings- every 750 mm of vertical rise. Width- 1200 mm or more.

Handrails to be on both sides at a height of 850mm-900mm; both ends to be rounded and grouted and extend 300mm beyond top and bottom of ramp.

Surfaces (ramp + landing) should be slip resistant.





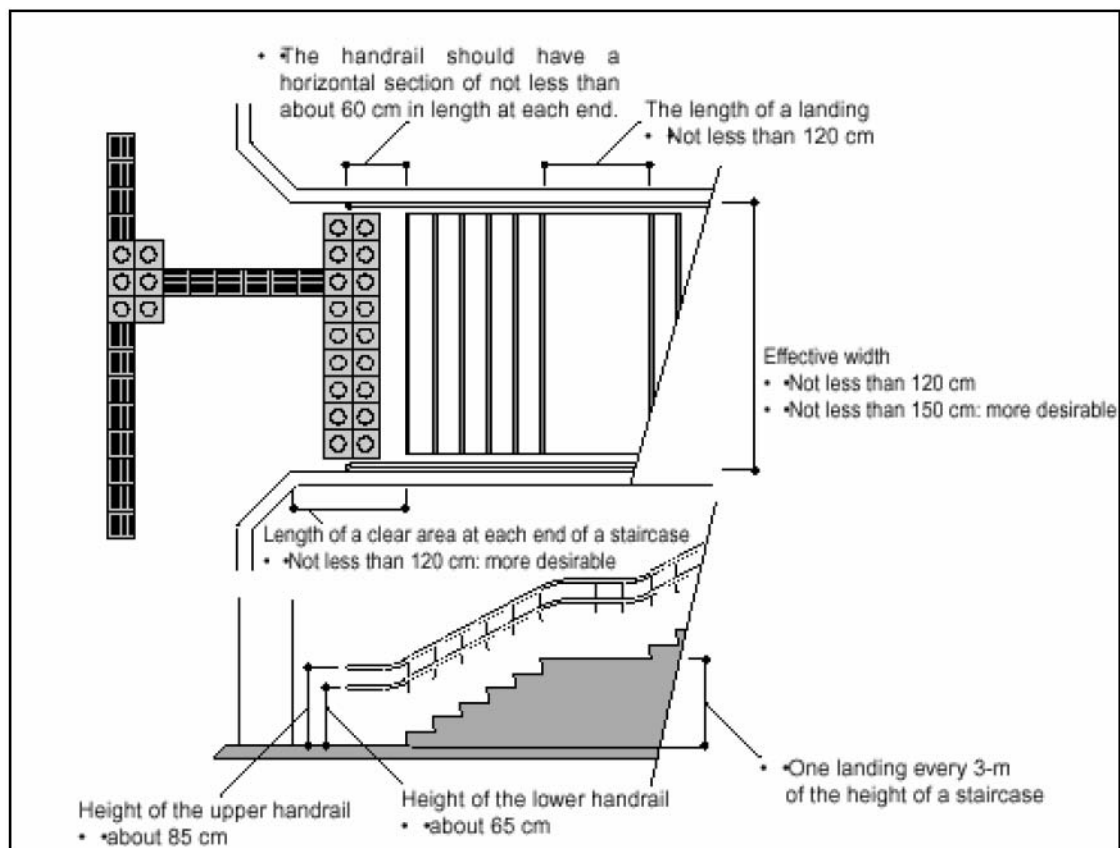
Existing  
**STEPS AND STAIRS**

Proposed

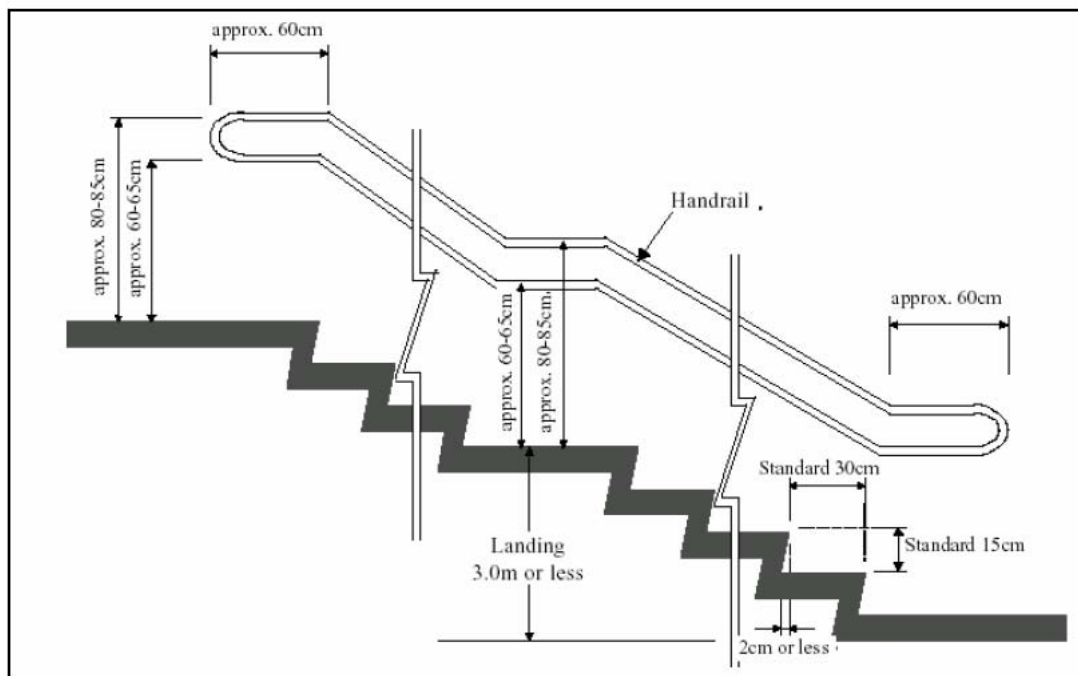
Handrails are not continuous and wall side should have handrails.  
Warning strip and edges of the steps, to be as per standards mentioned earlier.



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### Example of stairway structure and handrail installation



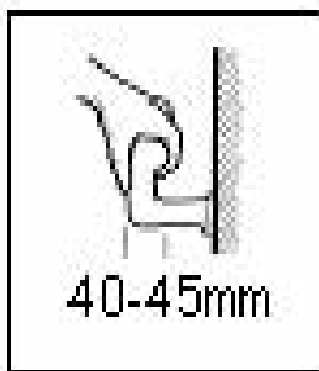
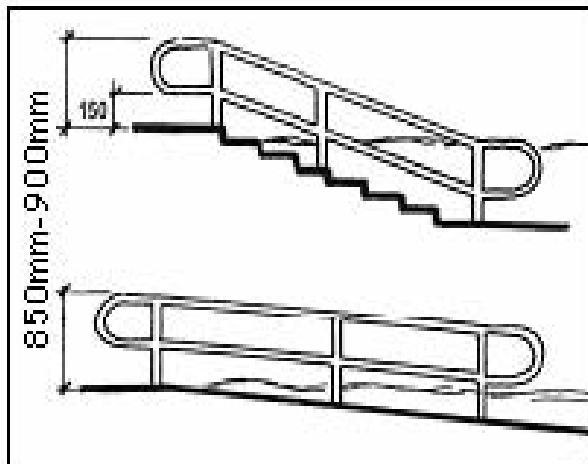
**S AND STAIRS** Uniform risers: 150 mm and tread: 300 mm. A band/strip of bright contrast colour (50 easier to identify the height and depth of the steps while climbing u down. Anti skid tapes can also be used.

The maximum height of a flight between landings to be 1200mm. Landing should be 1200mm deep, clear of any door swing. The steps Have continuous handrails on both sides including the wall (if any) at 850mm - 900mm.

Warning strip to be placed 300mm at the beginning and at the end of

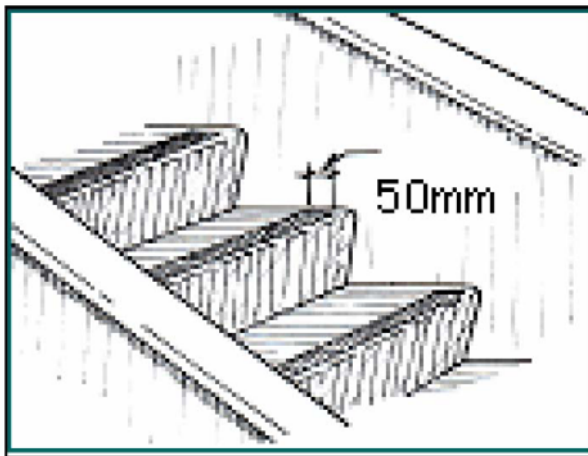
**HANDRAILS** All handrails should be circular in section with a diameter of 40-45mm; at least 45mm clear of the surface to which they are attached; at the height of 850mm-900mm from the floor, extend by at least 300mm beyond the head and foot of f

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Nosing to be avoided.





## **FIRST FLOOR**

### **General circulation area**



As there was no level difference in the flooring, it was easier for all mobility aid users to move around freely.

## **KENDRIYA BHANDAR**

It was found that the door entrances to all the centers/bank and stores were wide enough.



**However for other buildings following is proposed including the toilet doors.**

## Doors

- Should provide a clear opening of 900mm.
- Be fitted with a lever action locks and D-handles of circular section, between 850mm and 1100mm from floor level.
- Be color contrasted with the surrounding wall and should not be heavier than 22N to open.
- A distance of 450mm-600mm should be provided beyond the leading edge of door to enable a wheelchair user to maneuver and to reach the handle.
- Kick plates are recommended 300mm from the bottom, to resist wear and tear, by wheel chairs, service trolley etc.



## DTC BUS PASS SECTION

Service window was not only too small and the iron grill in the centre of the opening blocks easy movement of exchanges.

The cut out may be made a little bigger and the cut out to be mark with a bright contrasting colour which will benefit everyone.

Resting benches/chairs to be provided for mobility impaired students.

## DTC BUS PASS

Existing

Proposed



## **ICICI BANK**

Signage board with color contrast and bold letters are appropriate. Same can be replicated for other stores/sections.

## **RAILWAY RESERVATION OFFICE**



Resting spaces were provided here, good example of customer care.

There is a pillar in the circulation area and the counters were too high-1020mm.

Pillars to be painted in bright contrasting color to the background (preferably in bright yellow/red).



Service counter to be as mentioned earlier.

Two way mike system for students with vision impairment to be provided.







Existing



Existing

Proposed

As there were no. of counters and only one was manned, it is proposed that a separate counter identified for students with disabilities at least during vacations. For example existing counter no. 1305/1306 may be reserved for PwDs.

## TOILET

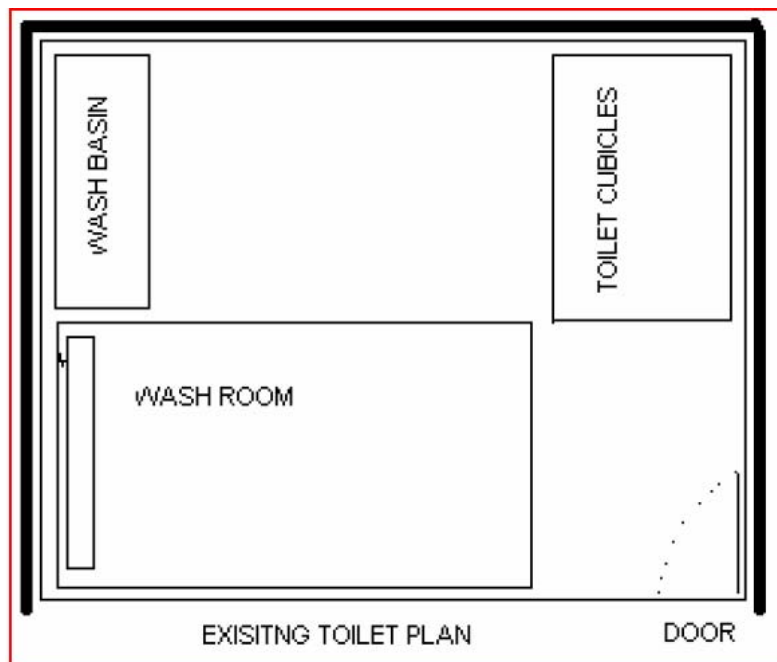
At least one toilet in a two storey building should be made accessible.

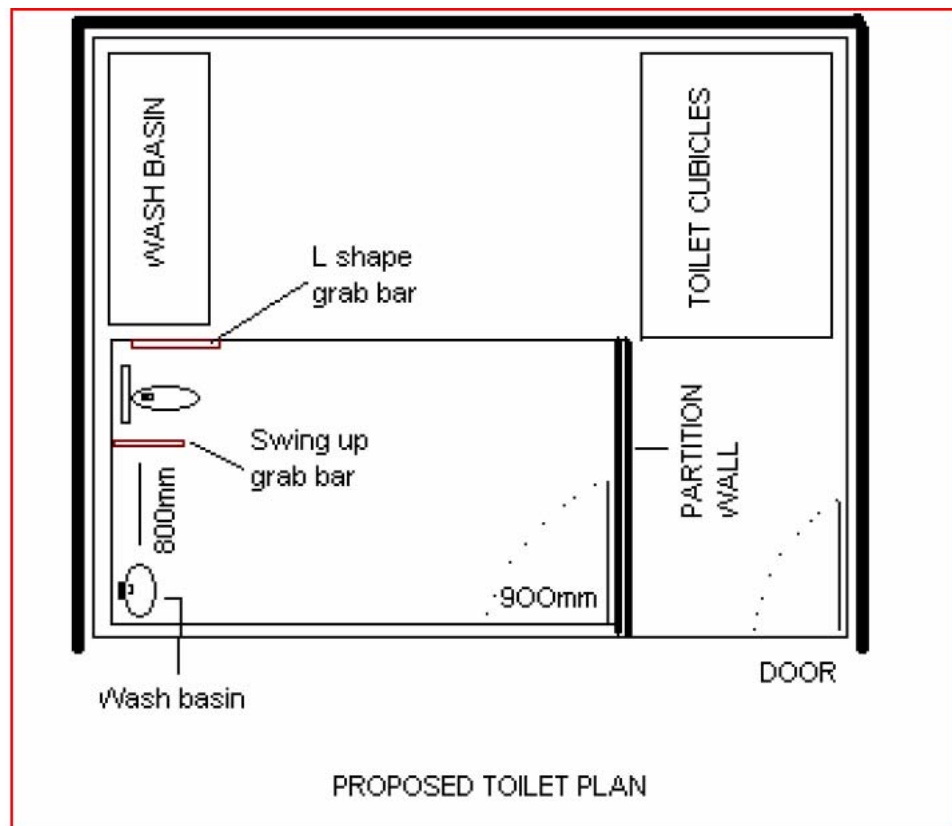
For high rise buildings, one toilet on alternate floor is proposed.

In total there are two toilets on this floor. Next to the Railway office there is a general toilet and has adequate space for providing a multi-use toilet with wheel chair space.

Directional signage for the same to be displayed at the corridor leading to the same, visible from the courtyard.







### Multi-use Toilet



A minimum of **one toilet compartment** should have enough floor space for

wheelchair users to enter and exit.

Clear floor space 2000mm x 1750mm.

Provide a door of clear opening of at least 900mm with the door swing outwards or be folding or sliding type.

Should have slip resistant flooring.

Be provided with a horizontal pull bar at least 600mm long on the inside and 140mm long on the outside, at a height of 700mm.

## **WATER CLOSET (WC)**

Have clear space of not less than 900mm wide next to the water closet.

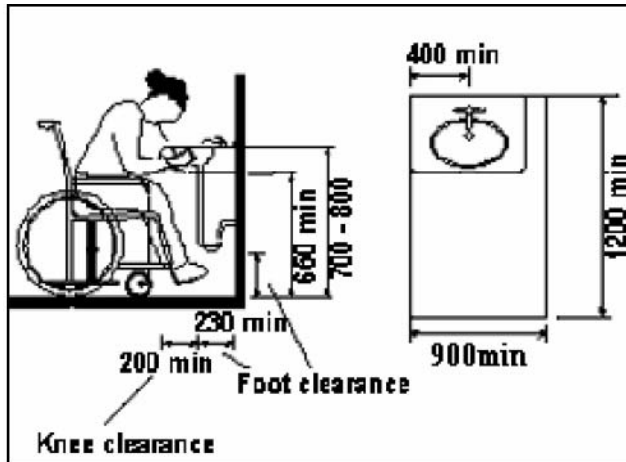
Be located between 460mm to 480mm from the centerline of the WC to the adjacent wall and have a clear dimension of 800mm from the edge of the WC to the rear wall to facilitate side transfer.

The top of the WC to be 475-490mm from the floor.

Have a back support.

Grab bars at the rear and the adjacent wall. On the transfer side- swing away/up type and on the wall side L-shape grab bars should be provided.

## **WASHBASIN**



Be of dimensions 520mm and 410mm, so mounted that the top edge is between 700mm-800mm from the floor; have a knee space of at least 760mm wide by 200mm deep by 650mm-680mm high.

Lever type handles for taps are recommended.

Mirror's bottom edge to be 900-1000mm from the floor and the mirror may be inclined at an angle.

**Accessible toilet** should have a switch near the WC (one at 300mm and the other at 900mm from the floor level), which activates an emergency audio alarm (at the reception/attendants desk, etc.).

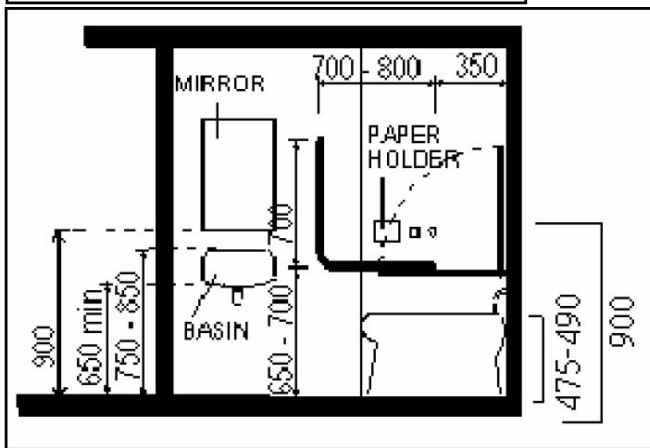
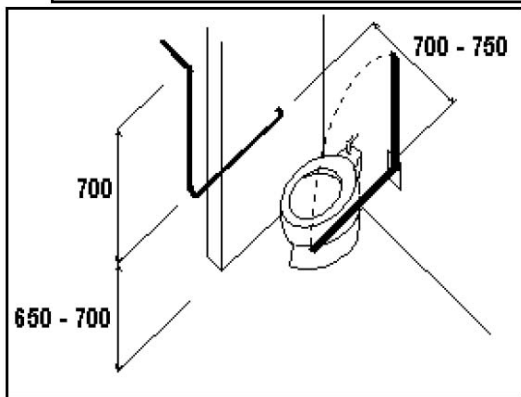
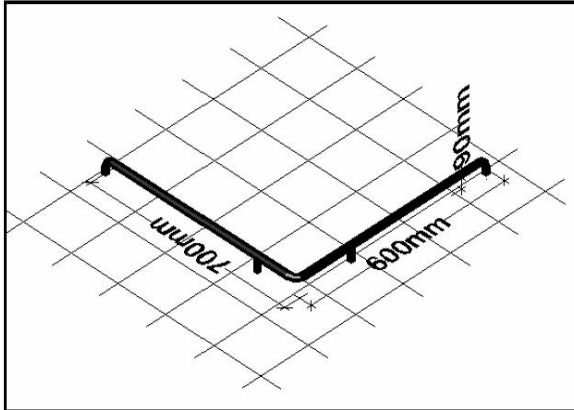
## **PLANS OF ACCESSIBLE TOILET**

L shape grab bar on the wall side of the toilet





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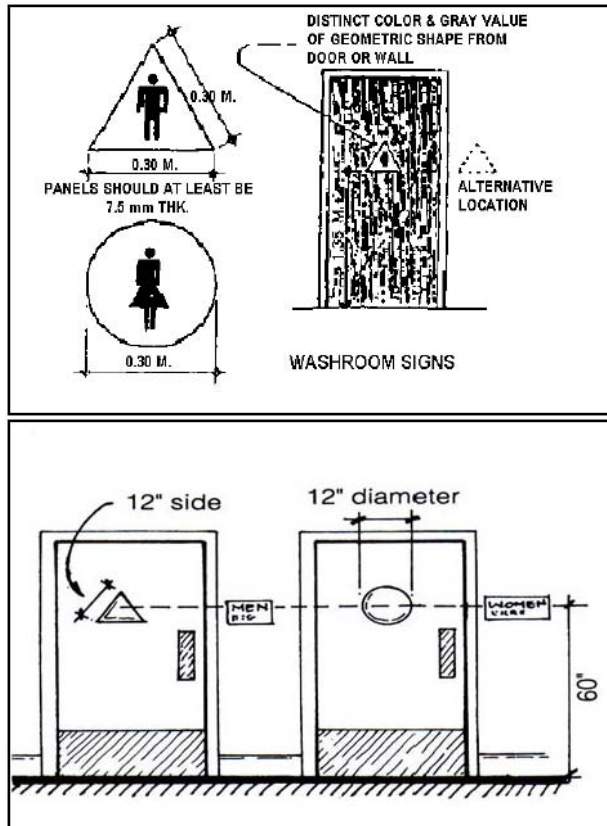


For students with low vision and vision impairments, following are proposed:

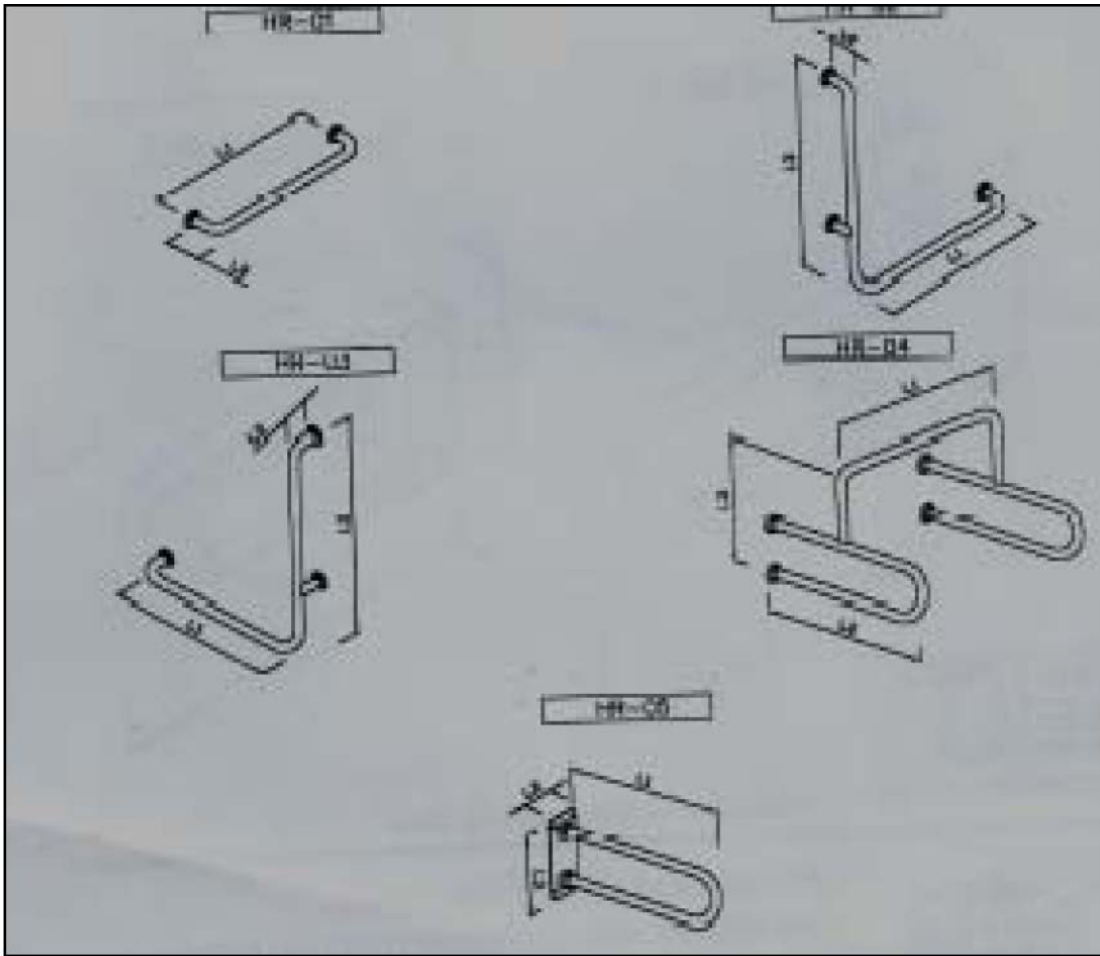
**Warning strip/ door mat** 300mm before the toilet entrance.

**Braille signage** should be displayed on the right side of every toilet by indicating embossed letters with ladies and gents pictogram.

All signage to be in raised alphabets at the eye level, on the wall and in bold and contrasting colors.



**Grab Bars for toilet**



## EXAMINATION WING

Enquiry counters/windows are marked by a platform (300mm) and the ht. of the counters is 1120mm. Information notices with timings etc. are too small to be read from a distance.

Ramp of 1:12 gradient to be provided, as shown in the photograph on both the sides of the platform

Counter ht. of all sections to be lowered down to 800mm as per the standards mentioned earlier.



There are coolers protruding in the platform which not only obstructs movement from counter to another, but also can prove hazardous.

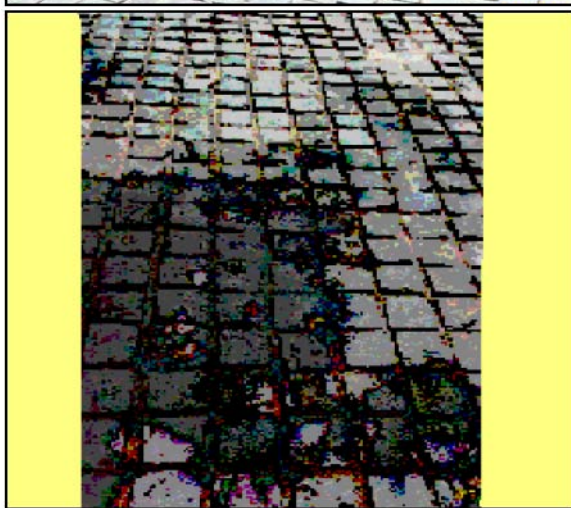




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Resting areas around the trees is a good example of universal design. This also serves as tree guards.





Main entrance has a big step. However, from the other side there is leveled entrance.

Signage – access symbol with directional arrow to be provided at this point to inform PwDs.

Coolers/AC is installed in the passage, at the leveled entrance to the Administrative block.



To be as stated earlier.

**Fee deposit counters**



Signage to be displayed stating the purpose/ utility of these counter.

A platform ht. of 400mm mark the counters.

Ramps to be provided on both the ends of the platform, as proposed for the Examination Wing counters.



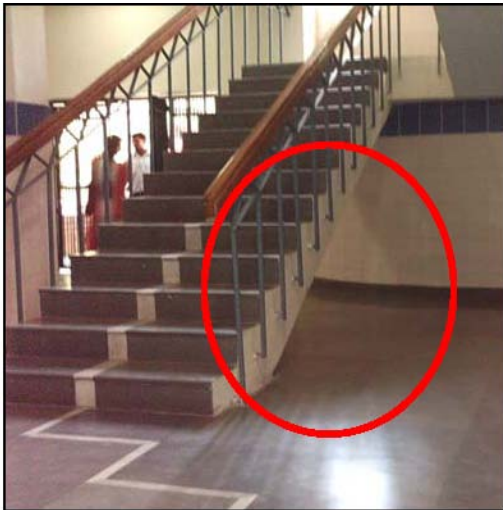
## **INTERNAL**

**Ground floor:** It was observed that the compared to other buildings/offices, the ground floor of this building was not well lit.

Proper illumination is proposed for the benefit of all including students with low vision.

**Sofit** (open space underneath the stair case) may cause accidental hazard for students with vision impairment.

A guardrail underneath the staircase should be provided to prevent people to hit the wall/ students with vision impairment walk underneath.



Steps and stairs to be as stated earlier.



## **LIFT**

The call button is at 1200mm and the door opening is 800mm.  
It has audio information, which is good for not only students with vision impairment but for everyone.

However for new constructions/renovations following are proposed:

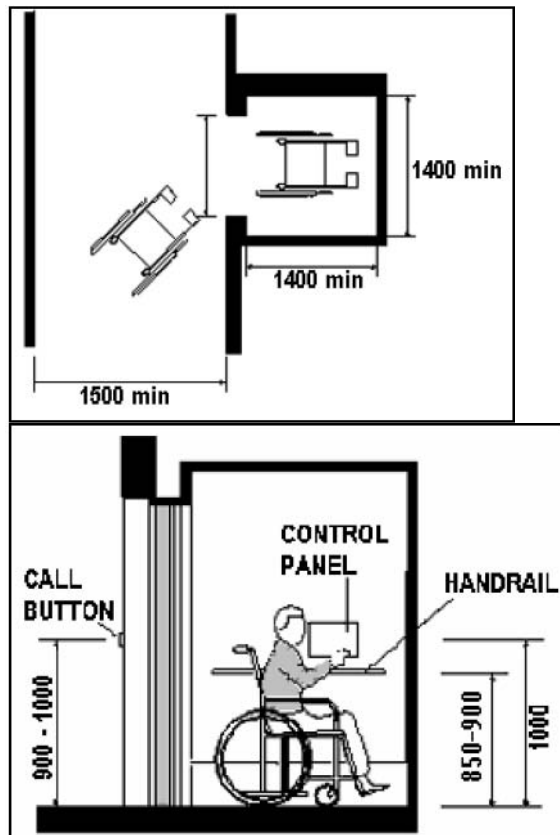
Floor: Minimum space for wheelchair users 1400mm x 1400 mm.

Doors: 900mm wide and closing mechanism to be adjusted to give adequate entry time.

Call button & control panel: At a reach of 900mm-1000mm; at least 400mm from any corner.

Control panel: Inside the lift to be on both the sides.

Braille information/raised numbers, audio and visual indicator, review mirror & kick plates to be fitted.



**Drinking water** tap is marked by a threshold making it impossible to reach it.

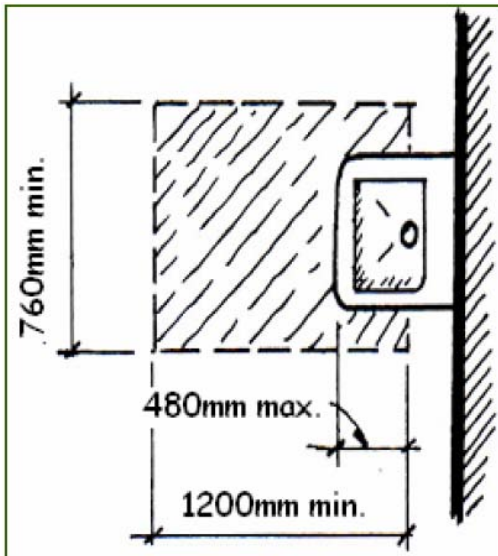


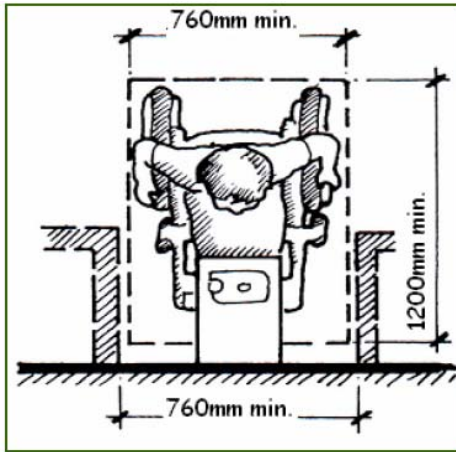


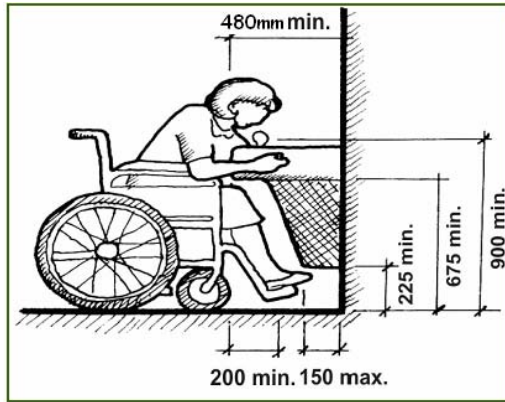
Water point is at a height of 1150mm, which is too high for a person in a seated position (wheel chair user).

To be lowered down so that all operable parts are between 900mm-1000mm height.

Leg and knee space to be provided (as shown in the diagrams with basin to avoid spillage of water).







Water Fountain at two levels

### General Toilets



There are two toilets (both ladies and gents) on this floor, with combination of Western commode and Indian toilet seat.

However none of the cubicles were accessible for students using mobility aids.





A multi use unisex toilet as mentioned earlier, to be provided by combining two toilet cubicles in any other general toilets.



**SCIENCE BLOCK**



### **Department of Chemistry**

Three steps marking the entrance to this department and Seminar hall, to have ramp. (Two ramps on each side of the entrance may be provided. This looks aesthetically good also).

Signages are prominently displayed in bold letters and color contrast. Same should be replicated everywhere.





### **M Sc. (P) Lab no.6**

One step to have a ramp and pillars to be in colour contrast to wall and door colors.

Door accessories to be as mentioned earlier.



**Other entrance to Department of Chemistry-**



To have leveled entry and reserved parking to be provided.  
The old building of Chemistry department should have a ramp (preferably on the right side of the steps).



There are open risers for the main staircase which are not good for PwDs.  
Steps with handrails should be as stated earlier.



**Lifts** are accessible and have both audio and visual displays.



Call Button and control panel with all other accessories, to be as mentioned earlier.

## **Illumination**

In some of the corridors the natural light was not sufficient.

To have proper illumination so as to allow easy access to signage/information/notice boards etc.

In all the lectures/examination rooms/labs/ etc. induction loop system is proposed.

Vision panel and door accessories as mentioned earlier.



General toilets (both Ladies and Gents), were found on every floor.  
Every floor to have a multi use unisex toilet.





## SECOND FLOOR

Signage, door accessories, room nos. to be as mentioned earlier.





## **DRINKING WATER COOLER**

Face of the cooler to be shifted in the front to allow both front and parallel access to students using mobility aids like wheel chair, crutches etc.

Taps to be lowered down (by reducing the platform ht. on which the cooler is placed)

To be lowered down so that all operable parts are between 900mm-1000mm height.

## **CHEMISTRY LAB**

One of the counters/wash basin/ tap ht. to be lowered down to provide knee and leg space.



## **DEPARTMENT OF PHYSICS**

Signage in Braille to be provided on the wall.

Laboratories to have at least one accessible counter/table.





**Protruding** window grills/ electrical units/ window AC in the circulation area to be relocated.

Some of the AC was installed above the door frame and it is proposed to replicate the same.



Good example of installation of protruding objects i.e. 2000mm above the floor level.



Entrances/exits to all buildings to have a combination of both steps and ramp.





Some of the departments have accessible furniture in the labs.





**Drug Discovery and Development Department is an excellent example.COFFEE HOUSE**

There is a sunken courtyard for the coffee house.



Ramp is not advised, as there is limited space and adequate gradient for two ramps might not be acquired.



It is proposed to raise the entire level of the courtyard (1200mm wide minimum) up to the door entrance (both for coffee house and the toilet) and merge the vertical gap. (Refer sketch)

Door to be open allowing students with reduced mobility and PwDs to enter inside easily.

Adjoining toilet to be modified into a multi use unisex toilet benefiting everyone.

There is service available for order placements. Also the counters were not too high and are accessible to a great extent.







Tables have adequate leg and knee space for mobility aid users.

**From the Girl's Hostel, way to the VC office/Administration block was found to have a no. of steep steps.**



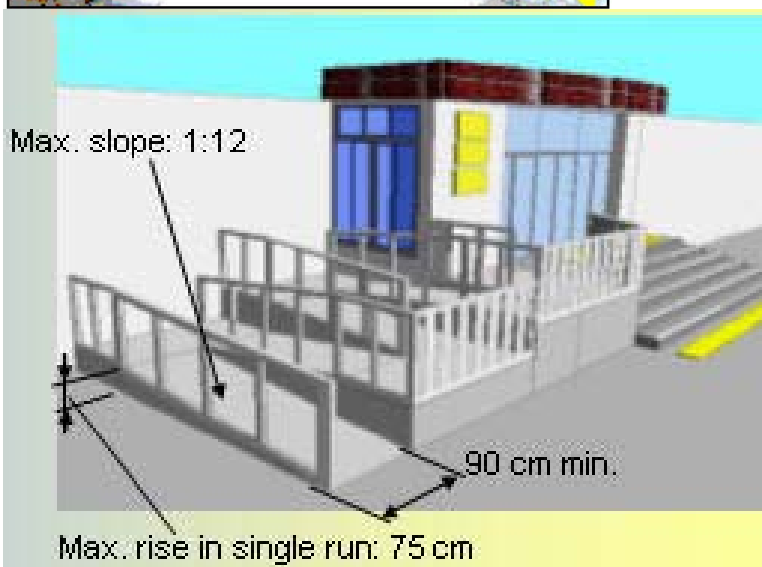
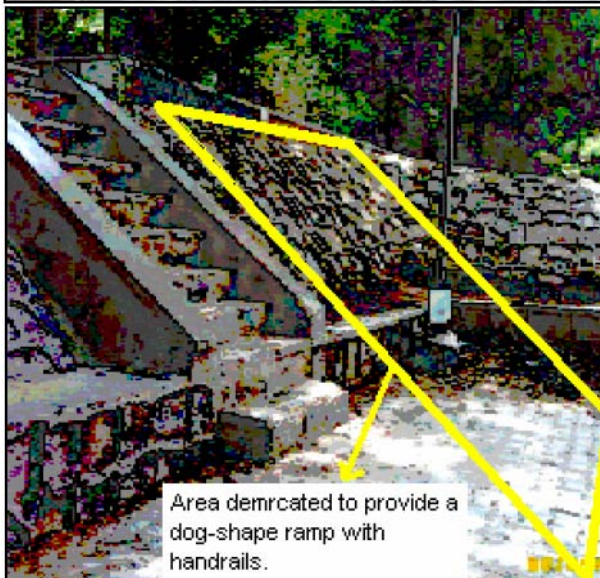
Steps to have even risers and handrails to be provided on both the sides, extending 300mm before and after the steps.

Warning strip as per the example sketch to be provided.

There are two suggestions to provide ramp.

I) To provide a ramp without modifying the existing staircase.

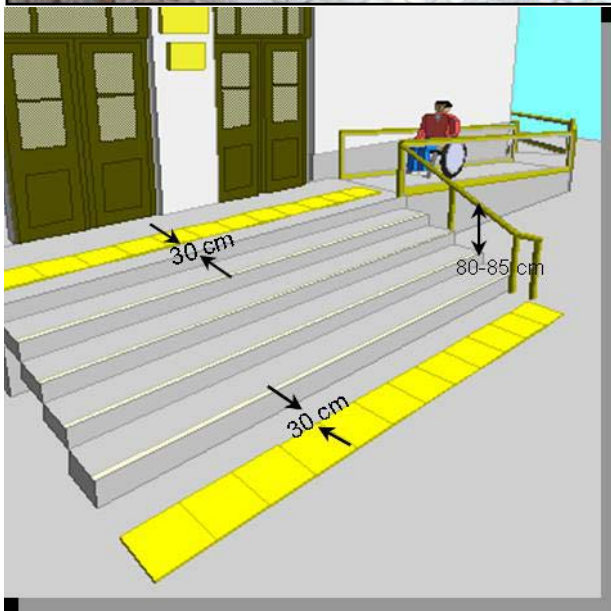


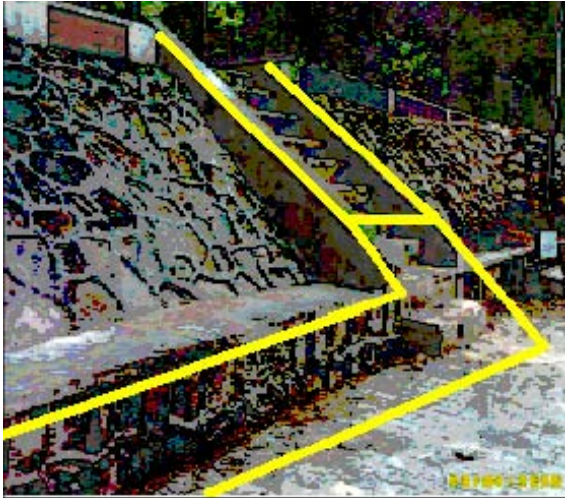


II) Second option is to provide a ramp on the existing staircase area (refer

sketch).

## GENERAL REMAKS





To eliminate steps and provide a L-shape ramp with handrails. The gradient to be 1:12  
Width = 900mm min.

**For all the lecture/seminar halls/ auditoriums/ labs etc.**

People with hearing impairments find it difficult to grasp mass audio activity. In an enclosed venue, it is possible to enclose a small area with a loop-induction system so that people with hearing impairments within it can hear voices and sounds without ambient noise.

**A loop-induction system** comprises of a microphone, an amplifier and a loop (a conducting wire encircling the enclosure). The sound of music or the voices of actors are converted into electromagnetic signals. The signals are carried to the loop. A pickup coil fitted in a hearing aid picks up the electromagnetic signals and the receiver in the ear converts this into comprehensible speech or music. Since the hearing aid does not pick up actual sound signals, it receives no ambient noise, ensuring good quality of sound.

## **EMERGENCIES**

Any plans for emergencies must consider the needs of Students with Disabilities. In emergencies, many disabled students will be less able to fend for themselves. Good planning can avoid such a disaster. Safety procedures must include rescue/escape assistance for disabled students. Emergency routes and exits should be well marked with colour and light, and assistance should be provided to those who are unable to use these cues.

## **EMERGENCY EVACUATION**

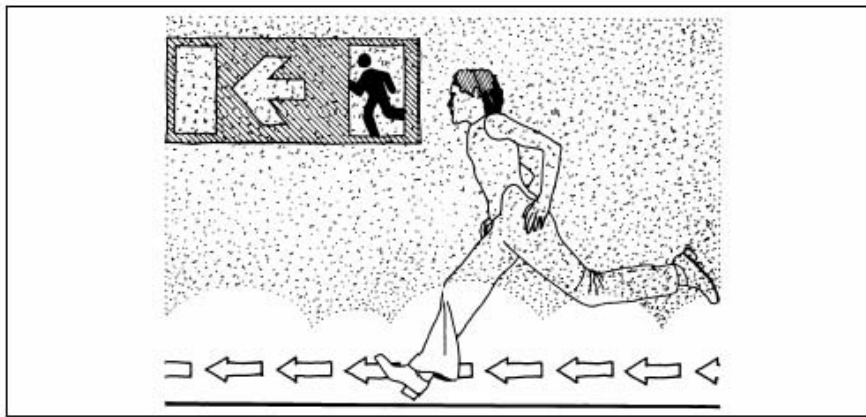
**Fire Refuge Area** at the landing of a fire escape staircase, equipped with two-way communication gadgets with clear signage, flashing bulbs & audio signals should be provided to facilitate emergency evacuation.

**Emergency exits** should be clearly marked with proper signage and should be clear of all obstructions.

**Emergency alarm** both audio (hooter type) and visual (flashing bulb) to be provided on each floor/level at strategic locations.

**Employees/staff and security guards**, need to be drilled for the same at periodic intervals.

An **access sensitization awareness training** to be given to security guards and staff handling/transferring students with disabilities to refuge area during emergency.



**Samarthya's Access Audit Team**

- 1) Mr. Sanjeev Sachdeva
- 2) Ms. Anjlee Agarwal
- 3) Ms. Sweety Bhalla
- 4) Ms. Suman Bala
- 5) Ms. Soma Mandal
- 6) Mr. Anand Prakash Kori

**Report complied by Ms. Anjlee Agarwal**